

Appendix A

Noise Assessment Report

NextEra Energy Canada, ULC

Goshen Wind Energy Centre – Noise Assessment Report

draft for discussion

Prepared by:

AECOM

5600 Cancross Court, Suite A

905.501.0641 tel

Mississauga, ON, Canada L5R 3E9

905.501.0181 fax

www.aecom.com

Project Number:

60155032

Date:

July, 2012

AECOM Signatures

Report Prepared By:

Alex Dundon, EIT, MIEAust
Acoustic Specialist

Buddy Ledger, P.Eng., INCE
Acoustic and Vibration Engineer

Report Reviewed By:

Alan Oldfield, MEng, CEng(UK), P.Eng.
Acoustics Engineer

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1. Introduction

AECOM was retained by NextEra Energy Canada, ULC (NextEra) to prepare a Noise Assessment Report for the proposed Goshen Wind Energy Centre (Goshen). This report has been prepared in accordance with the Ontario Ministry of the Environment (MOE) guideline “Noise Guidelines for Wind Farms – Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities” (October 2008). This report will form part of the Renewable Energy Approval (REA) application for the Facility as required under Ontario Regulation 359/09.

2. Project Layout

Approval is being sought for 72 wind turbines, 71 of which are rated at 1.6 Megawatts maximum generation capacity, and one wind turbine rated at 1.56 Megawatts maximum generation capacity.

However, it is expected that only 63 of the wind turbines will actually be installed in order to achieve the total peak generation target of approximately 102 Megawatts facility wide. All of the wind turbines will feed into a centrally located transformer substation.

The proposed project is located in Huron County, within the Municipalities of Bluewater and South Huron. The Project Study Area consists of the areas being studied for the wind farm components (Wind Energy Centre Study Area), as well as for the interconnection route (i.e., the area being studied for transmission lines to connect the Project to the electrical grid) (Transmission Line Study Area). The Wind Energy Centre Study Area is generally bounded by Klondyke Road to the west, Rogerville Road to the north, Parr Line to the east, and Mount Carmel Drive to the south, in the Municipalities of Bluewater and South Huron. The Transmission Line Study Area is located to the east of the Wind Energy Centre Study Area, and is generally bounded by Parr Line to the west, Thames Road to the north, Perth 164 Road to the east, and Park Road to the south, extending into the Municipality of South Huron.

A figure showing the project location, wind turbine layout and transformer location is provided in Appendix A.

3. Noise Assessment Guideline

Part V.0.1 of the Ontario Environmental Protection Act R.S.O. 1990 (EPA) addresses the approvals process required for renewable energy projects and Ontario Regulation 359/09, which forms part of the EPA, outlines the specific requirements for obtaining a Renewable Energy Approval (REA) from the MOE.

As required by O.Reg. 359/09, noise from wind farm projects requiring approval within Ontario is assessed using the MOE guideline: “Noise Guidelines for Wind Farms – Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities” (PIBS 4709e, October 2008). This guideline sets the definitions, assessment procedures and noise level limits for noise assessments of wind farm projects.

The Project Study Area is best defined as a Class 3 Area, as per MOE Publication 4709e. A Class 3 Area is defined as “a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as the following: a small community with less than 1000 population; agricultural area; a rural recreational area such as a cottage or a resort area; or a wilderness area.” The MOE noise level limits, at integer wind speeds, for points of reception in Class 3 areas are summarized in Table 1 below.

Table 1. Noise Level Limits for Wind Turbines

Point of Reception Classifications	1-hr L_{EQ} Sound Level Limit (dBA) at 10m height Wind Speeds (m/s)				
	Less than or equal to 6 m/s	7 m/s	8 m/s	9 m/s	Greater than or equal to 10 m/s
Class 1 & 2 Areas	45.0	45.0	45.0	49.0	51.0
Class 3 Areas	40.0	43.0	45.0	49.0	51.0

4. Noise Sources

There are two wind turbine models proposed for this project. These are the following:

- 71 GE 1.6-100 with Low-Noise Trailing Edges (LNTes) wind turbines manufactured by General Electric.
 - Hub height of 80 metres
 - Rotor diameter of 100 metres
 - Operates between 9.75 and 15.33 revolutions per minute
 - Electrical generation rating of 1.6 Megawatts
- One GE 1.56-100 wind turbine manufactured by General Electric.
 - Hub height of 80 metres
 - Rotor diameter of 100 metres
 - Operates between 9.75 and 16.18 revolutions per minute
 - Electrical generation rating of 1.56 Megawatts

Manufacturers' noise data for the wind turbine models are summarized in Table 3 and Table 4 of Section 0 and the original manufacturer's datasheet is provided in Appendix D. The noise datasheets provided have been prepared and reported in accordance with IEC 61400-11¹ (equivalent to CAN/CSA-C61400-11). The calculations used to adjust for site specific wind shear are also presented in Appendix D.

The electricity generated by each wind turbine will be collected at a central transformer substation. The performance specification of the transformer will require that the noise emissions be measured in accordance with ANSI C57.12.90 at the highest (MVA) rating with all fans in operation and at the tap position that creates the highest current. The performance specification will require that the average sound pressure level measured in accordance with Section 13 of ANSI C57.12.90² shall not exceed 80 dBA over the measurement surface (as defined in the ANSI standard). An estimate of the noise emissions expected from the transformer is provided in Table 6. Appendix D includes a detailed calculation to support the transformer emission estimate. Note that a 5dB penalty has been added to the transformer emission level in the noise prediction modelling as per the requirements of PIBS 4709e³.

The MOE requires that the cumulative noise impact of existing or proposed⁴ wind farms also be included in the noise impact analysis. To that end all existing or proposed wind farms within 5 kilometres of the Goshen Wind Energy Centre were included in the noise impact analysis. There is one such facility which is named The Zurich Wind Farm. The Zurich Wind Farm consists of one (1) Enercon E-48 model turbine which has a rated generation capacity of 800 kilowatts. Manufacturer's noise data for the E-48 are summarized in Table 5 of Section 8 and the original

1. IEC 61400-11, *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*, International Electrotechnical Commission, 2006.
2. ANSI C57.12.90 (IEEE C57.12.90-1993), *IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and IEEE Guide for Short-Circuit Testing of Distribution and Power Transformers*, Institute of Electrical and Electronics Engineers, Inc., 1993.
3. PIBS 4709e, *Noise Guidelines for Wind Farms – Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities*, Ontario Ministry of the Environment, Queens Printer for Ontario, October 2008.
4. *Proposed projects which have not yet published a site plan do not have to be accounted for in the noise impact analysis as insufficient information would be available to do so.*

manufacturer's datasheet is provided in Appendix D. The noise datasheets have been prepared and reported in accordance with IEC 61400-11 (equivalent to CAN/CSA-C61400-11). The calculations used to adjust for site specific wind shear are also presented in Appendix D.

Table 7 of Section 0 provides the coordinates of all noise sources considered in the noise impact analysis and assessment.

5. Points of Reception

Table 8 in Section 8 lists all of the points of reception considered in the noise impact analysis as well as their coordinates. The points of reception have been classified into four (4) different categories which are outlined in Table 2, below.

Table 2. Point of Reception Classifications

Class	Number of Points of Reception	Description	Remarks
POR	419	Non-participating	MOE Limits Apply
PR	52	Participating	MOE Limits Do Not Apply
VPO	382	Vacant Lot Non-participating	MOE Limits Apply
VPR	57	Vacant Lot Participating	MOE Limits Do Not Apply

The classifications POR and VPO are both non-participating and are subject to the noise level limits outlined in the MOE noise guideline (PIBS 4709e, see Table 1).

Vacant lots are defined as receptors under PIBS 4709e as any that have been zoned by the local municipality to permit residential or similar noise sensitive uses. Where the receptor location is unknown at the time of the proposal, it is to be assumed to be based on a 1 hectare building envelope within the vacant lot property that would reasonably be expected to contain a noise sensitive use.

The classifications PR and VPR are both participating and are not subject to the noise level limits outlined in the MOE noise guideline. Participating points of reception are associated with the wind farm development via a legal agreement with the owner of the subject property to allow the installation and operation of wind turbines or related equipment.

6. Detailed Noise Impact Assessment

The noise analysis for the Goshen Wind Energy Centre was completed using SoundPLAN 7.1 environmental noise modelling software. The noise modelling was conducted in accordance with the international standard ISO 9613-2. The noise predictions were calculated using downwind propagation from each source to each point of reception, which produces a theoretical worst case prediction at each point of reception. The noise impact calculations were completed using octave band spectral values in the range of 63 to 8000Hz for each integer wind speed from 6 to 10 m/s.

The noise model was configured to calculate the contribution of each noise source within 5 kilometres from each point of reception. The air attenuation and ground attenuation calculation within the model were configured according to Section 6.4.10 of the MOE noise guideline (PIBS 4709e).

The noise impact at each point of reception, for each integer wind speed from 6 to 10m/s, is presented in Table 8 within Section 8. All of the noise predictions were completed in accordance with the detailed requirements of the MOE noise guideline (PIBS 4709e).

7. Results and Compliance

The results of the noise modelling in Table 8 within Section 8 show that the wind energy centre is in compliance with the MOE noise level limits at all points of reception within 1500 metres of turbines associated with the project.

Therefore, the 419 non-participating and 382 vacant lot non-participating points of reception assessed comply with the MOE sound level limits for Wind Turbines in Class 3 areas (See Table 1). Appendix B includes noise contour maps for each integer wind speed from 6 to 10m/s and a sample calculation is provided in Appendix C. In order to achieve compliance with the MOE noise limits in the vicinity of the transformer substation a five (5) metre high noise barrier is required surrounding this source of noise.

8. Summary Tables

Table 3. Wind Turbine Acoustic Emission Summary – GE 1.6-100 LNTE

Make: General Electric Model: GE 1.6-100 LNTE Electrical Rating: 1.6 Megawatts Hub Height (m): 80 metres Wind Shear Coefficient: 0.2627											
		Octave Band Sound Power Level (dBA)									
		Manufacturer's Emission Levels					Adjusted Emission Levels				
Wind Speed (m/s)		6	7	8	9	10	6	7	8	9	10
Frequency (Hz)	63	85.5	89.2	89.6	89.7	89.6	89.2	89.7	89.6	89.6	89.6
	125	90.8	93.9	94.3	94.4	94.3	93.9	94.4	94.3	94.3	94.3
	250	94.4	95.0	95.1	95.2	95.2	95.0	95.2	95.2	95.2	95.2
	500	95.0	96.3	96.1	96.2	96.5	96.3	96.2	96.5	96.5	96.5
	1000	91.2	96.4	96.9	97.0	97.2	96.4	97.0	97.2	97.2	97.2
	2000	91.9	95.0	95.2	94.9	94.3	95.0	94.9	94.3	94.3	94.3
	4000	88.4	89.0	88.6	87.9	87.1	89.0	87.9	87.1	87.1	87.1
	8000	69.7	69.7	70.0	68.8	68.7	69.7	68.8	68.7	68.7	68.7
Overall		101.6	102.8	103.0	103.0	103.0	102.8	103.0	103.0	103.0	103.0

Table 4. Wind Turbine Acoustic Emission Summary – GE 1.56-100

Make: General Electric Model: GE 1.56-100 Electrical Rating: 1.56 Megawatts Hub Height (m): 80 metres Wind Shear Coefficient: 0.2627											
		Octave Band Sound Power Level (dBA)									
		Manufacturer's Emission Levels					Adjusted Emission Levels				
Wind Speed (m/s)		6	7	8	9	10	6	7	8	9	10
Frequency (Hz)	63	86.2	90.5	91.2	91.2	91.2	90.5	91.2	91.2	91.2	91.2
	125	90.1	94.2	94.8	94.9	94.8	94.2	94.8	94.8	94.8	94.8
	250	91.9	93.9	94.2	94.2	94.2	93.9	94.2	94.2	94.2	94.2
	500	94.6	95.7	94.6	94.5	94.5	95.7	94.6	94.5	94.5	94.5
	1000	95.2	99.6	99.1	98.9	98.8	99.6	99.1	98.8	98.8	98.8
	2000	91.3	97.2	98	98.1	98.2	97.2	98	98.2	98.2	98.2
	4000	84.6	88.4	88.8	89.2	89.5	88.4	88.8	89.5	89.5	89.5
8000		68	71.1	71.2	70.7	70.5	71.1	71.2	70.5	70.5	70.5
Overall		100.4	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0

Table 5. Wind Turbine Acoustic Emission Summary – E-48

Make: ENERCON											
Model: E-48											
Electrical Rating: 800 Kilowatts											
Hub Height (m): 76 metres											
Wind Shear Coefficient: 0.2627											
		Octave Band Sound Power Level (dBA)									
		Manufacturer's Emission Levels					Adjusted Emission Levels				
Wind Speed (m/s)		6	7	8	9	10	6	7	8	9	10
Frequency (Hz)	63	79.5	81.6	79.6	79.8	78.6	81.6	79.8	78.6	78.6	78.6
	125	83.6	86.3	86.0	87.3	84.4	86.3	87.3	84.4	84.4	84.4
	250	90.5	93.8	95.1	96.1	93.3	93.8	96.1	93.3	93.3	93.3
	500	92.8	95.7	97.1	97.5	96.8	95.7	97.5	96.8	96.8	96.8
	1000	92.6	94.1	95.5	95.1	97.9	94.1	95.1	97.9	97.9	97.9
	2000	87.4	89.0	89.1	90.0	92.7	89.0	90.0	92.7	92.7	92.7
	4000	83.6	86.1	85.8	88.8	87.6	86.1	88.8	87.6	87.6	87.6
	8000	80.2	83.6	83.6	87.1	84.6	83.6	87.1	84.6	84.6	84.6
Overall		97.8	100.3	101.4	102.0	102.1	100.3	102.0	102.1	102.1	102.1

Table 6. Transformer Acoustic Emission Summary

Octave Band Centre Frequency (Hz)	31	63	125	250	500	1000	2000	4000	8000	Overall
Transformer Sound Power (dBA)	91.0	97.0	99.0	94.0	94.0	88.0	83.0	78.0	71.0	103.0
Tonal Penalty ¹ (dB)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Resultant Transformer Sound Power (dBA)	96.0	102.0	104.0	99.0	99.0	93.0	88.0	83.0	76.0	108.0

Notes: 1. The tonal penalty is required for transformers serving more than one wind turbine as per MOE PIBS 4709e.

Table 7. Wind Turbine and Transformer Locations

Identifier	Equipment Make & Model	UTM Coordinates		Remarks
		X	Y	
Project Name: Goshen Wind Energy Facility				
SUB	Unknown	454558	4794974	Transformer
G_02	GE 1.6-100 LNTE	450520	4805782	-
G_03	GE 1.6-100 LNTE	451051	4805361	-
G_04	GE 1.6-100 LNTE	450524	4804972	-
G_05	GE 1.6-100 LNTE	451300	4804616	-
G_06	GE 1.6-100 LNTE	451203	4803770	-
G_07	GE 1.6-100 LNTE	446869	4804385	-
G_08	GE 1.6-100 LNTE	447071	4803417	-
G_09	GE 1.6-100 LNTE	446830	4802090	-
G_10	GE 1.6-100 LNTE	448722	4804602	-
G_11	GE 1.6-100 LNTE	448568	4803670	-
G_12	GE 1.6-100 LNTE	449241	4803328	-
G_13	GE 1.6-100 LNTE	448911	4802237	-
G_14	GE 1.6-100 LNTE	448875	4801624	-
G_15	GE 1.6-100 LNTE	449226	4800450	-
G_16	GE 1.6-100 LNTE	444383	4793947	-
G_17	GE 1.6-100 LNTE	443972	4792675	-
G_19	GE 1.6-100 LNTE	445549	4795811	-

Identifier	Equipment Make & Model	UTM Coordinates		Remarks
		X	Y	
G_20	GE 1.6-100 LNTE	445679	4795219	-
G_21	GE 1.6-100 LNTE	445847	4794126	-
G_22	GE 1.6-100 LNTE	447530	4795721	-
G_23	GE 1.6-100 LNTE	447843	4796331	-
G_31	GE 1.6-100 LNTE	452335	4797930	-
G_32	GE 1.6-100 LNTE	452553	4796971	-
G_33	GE 1.6-100 LNTE	452366	4796399	-
G_34	GE 1.6-100 LNTE	453108	4799573	-
G_35	GE 1.6-100 LNTE	454089	4796605	-
G_36	GE 1.6-100 LNTE	446196	4792203	-
G_37	GE 1.6-100 LNTE	446287	4791638	-
G_38	GE 1.6-100 LNTE	446167	4791042	-
G_39	GE 1.6-100 LNTE	447984	4793710	-
G_41	GE 1.6-100 LNTE	448895	4791606	-
G_42	GE 1.6-100 LNTE	448990	4790737	-
G_46	GE 1.6-100 LNTE	452699	4790500	-
G_47	GE 1.6-100 LNTE	452425	4792588	-
G_48	GE 1.6-100 LNTE	452825	4793244	-
G_49	GE 1.6-100 LNTE	454586	4792838	-
G_50	GE 1.6-100 LNTE	455040	4793271	-
G_52	GE 1.56-100	440156	4788373	-
G_53	GE 1.6-100 LNTE	442135	4790871	-
G_54	GE 1.6-100 LNTE	439792	4790436	-
G_55	GE 1.6-100 LNTE	440005	4789811	-
G_56	GE 1.6-100 LNTE	439925	4788922	-
G_57	GE 1.6-100 LNTE	438121	4790232	-
G_58	GE 1.6-100 LNTE	437973	4789428	-
G_59	GE 1.6-100 LNTE	438098	4788616	-
G_60	GE 1.6-100 LNTE	437501	4789050	-
G_61	GE 1.6-100 LNTE	437294	4788459	-
G_62	GE 1.6-100 LNTE	437743	4788017	-
G_63	GE 1.6-100 LNTE	438227	4787615	-
G_64	GE 1.6-100 LNTE	446988	4791822	-
G_65	GE 1.6-100 LNTE	454014	4798992	-
G_66	GE 1.6-100 LNTE	446376	4794650	-
G_67	GE 1.6-100 LNTE	453955	4799707	-
G_68	GE 1.6-100 LNTE	450577	4790696	-
G_69	GE 1.6-100 LNTE	450788	4791504	-
G_70	GE 1.6-100 LNTE	450838	4792170	-
G_71	GE 1.6-100 LNTE	451847	4795547	-
G_72	GE 1.6-100 LNTE	450670	4804345	-
G_73	GE 1.6-100 LNTE	453192	4800669	-
G_74	GE 1.6-100 LNTE	453886	4795484	-
G_75	GE 1.6-100 LNTE	454731	4795014	-
G_76	GE 1.6-100 LNTE	454137	4793736	-
G_77	GE 1.6-100 LNTE	453186	4791237	-
G_78	GE 1.6-100 LNTE	447027	4790721	-
G_79	GE 1.6-100 LNTE	441914	4791634	-
G_80	GE 1.6-100 LNTE	445510	4796315	-
G_81	GE 1.6-100 LNTE	450167	4794140	-
G_82	GE 1.6-100 LNTE	452242	4793145	-
G_83	GE 1.6-100 LNTE	441815	4792131	-
G_84	GE 1.6-100 LNTE	438410	4790647	-
G_85	GE 1.6-100 LNTE	446173	4795111	-
G_86	GE 1.6-100 LNTE	446578	4793447	-
Project Name: Zurich Wind Farm				
Z_1	E-48	446741	4808398	Existing Turbine

Point of Reception ID	Class	Height (m)	UTM Coordinates		Distance to Nearest Turbine (m)	Nearest Turbine ID	Distance to Transformer Substation (m)	Calculated Noise Level at Selected Wind Speeds (dBA)					Noise Level Limit (dBA)					Compliant or Non-compliant*
			X (m)	Y (m)				6	7	8	9	10	6	7	8	9	10	
G_POR_3540	POR	4.5	455496	4794352	1012	G_75	1124	35.4	35.6	35.7	35.7	35.7	40.0	43.0	45.0	49.0	51.0	C
G_POR_3541	POR	4.5	455545	4794039	919	G_50	1359	35.4	35.5	35.6	35.6	35.6	40.0	43.0	45.0	49.0	51.0	C
G_POR_3542	POR	4.5	455587	4794054	955	G_50	1379	35.1	35.3	35.3	35.3	35.3	40.0	43.0	45.0	49.0	51.0	C
G_POR_3543	POR	4.5	455584	4794034	937	G_50	1390	35.2	35.3	35.4	35.4	35.4	40.0	43.0	45.0	49.0	51.0	C
G_POR_3544	POR	4.5	455532	4794108	971	G_50	1302	35.4	35.5	35.6	35.6	35.6	40.0	43.0	45.0	49.0	51.0	C
G_POR_3545	POR	4.5	455530	4794142	999	G_50	1278	35.3	35.5	35.6	35.6	35.6	40.0	43.0	45.0	49.0	51.0	C
G_POR_3546	POR	4.5	455569	4794133	1011	G_50	1314	35.1	35.3	35.4	35.4	35.4	40.0	43.0	45.0	49.0	51.0	C
G_POR_3547	POR	4.5	455576	4794108	994	G_50	1335	35.1	35.3	35.3	35.3	35.3	40.0	43.0	45.0	49.0	51.0	C
G_POR_3548	POR	4.5	455578	4794094	983	G_50	1346	35.1	35.3	35.3	35.3	35.3	40.0	43.0	45.0	49.0	51.0	C
G_POR_3549	POR	4.5	455542	4794078	950	G_50	1330	35.3	35.5	35.6	35.6	35.6	40.0	43.0	45.0	49.0	51.0	C
G_POR_3550	POR	4.5	455542	4794057	933	G_50	1344	35.4	35.5	35.6	35.6	35.6	40.0	43.0	45.0	49.0	51.0	C
G_POR_3551	POR	4.5	455547	4794011	897	G_50	1379	35.4	35.6	35.7	35.7	35.7	40.0	43.0	45.0	49.0	51.0	C
G_POR_3552	POR	4.5	455547	4793984	875	G_50	1398	35.5	35.7	35.7	35.7	35.7	40.0	43.0	45.0	49.0	51.0	C
G_POR_3553	POR	4.5	455548	4793960	856	G_50	1416	35.5	35.7	35.8	35.8	35.8	40.0	43.0	45.0	49.0	51.0	C
G_POR_9993	POR	4.5	456159	4794276	1504	G_50	1744	31.7	31.8	31.9	31.9	31.9	40.0	43.0	45.0	49.0	51.0	C
G_POR_9994	POR	4.5	455569	4794190	1060	G_50	1278	35.1	35.3	35.3	35.3	35.3	40.0	43.0	45.0	49.0	51.0	C
G_POR_9995	POR	4.5	455558	4794189	1054	G_50	1270	35.2	35.3	35.4	35.4	35.4	40.0	43.0	45.0	49.0	51.0	C
G_POR_9996	POR	4.5	455477	4794182	1011	G_50	1212	35.6	35.7	35.8	35.8	35.8	40.0	43.0	45.0	49.0	51.0	C
G_POR_9997	POR	4.5	455584	4794069	966	G_50	1367	35.1	35.3	35.3	35.3	35.3	40.0	43.0	45.0	49.0	51.0	C
G_POR_9998	POR	4.5	445277	4792814	1104	G_36	9533	35.6	35.8	35.9	35.9	35.9	40.0	43.0	45.0	49.0	51.0	C
G_POR_9999	POR	4.5	450031	4789121	1667	G_68	7402	29.3	29.5	29.6	29.6	29.6	40.0	43.0	45.0	49.0	51.0	C
G_PR_0247	PR	4.5	446217	4802093	613	G_09	10967	35.7	35.9	36.0	36.0	36.0	-	-	-	-	-	-
G_PR_0347	PR	4.5	447126	4796046	518	G_22	7512	39.1	39.3	39.4	39.4	39.4	-	-	-	-	-	-
G_PR_0354	PR	4.5	447050	4795874	504	G_22	7564	39.2	39.4	39.5	39.5	39.5	-	-	-	-	-	-
G_PR_0482	PR	4.5	445658	4791230	543	G_38	9659	38.9	39.2	39.2	39.2	39.2	-	-	-	-	-	-
G_PR_0504	PR	4.5	445476	4792102	727	G_36	9529	37.2	37.4	37.4	37.4	37.4	-	-	-	-	-	-
G_PR_0505	PR	4.5	445370	4792094	833	G_36	9632	36.4	36.6	36.7	36.7	36.7	-	-	-	-	-	-
G_PR_0549	PR	4.5	444903	4795827	646	G_19	9695	38.1	38.3	38.4	38.4	38.4	-	-	-	-	-	-
G_PR_0759	PR	4.5	439153	4788974	774	G_56	16535	37.9	38.0	38.1	38.1	38.1	-	-	-	-	-	-
G_PR_0771	PR	4.5	439692	4787986	604	G_52	16430	38.1	38.1	38.0	38.0	38.0	-	-	-	-	-	-
G_PR_0797	PR	4.5	439548	4789871	461	G_55	15857	40.7	40.9	40.9	40.9	40.9	-	-	-	-	-	-
G_PR_0880	PR	4.5	441343	4791958	503	G_83	13558	39.2	39.4	39.4	39.4	39.4	-	-	-	-	-	-
G_PR_0888	PR	4.5	441465	4791444	488	G_79	13564	39.4	39.6	39.6	39.6	39.6	-	-	-	-	-	-
G_PR_0891	PR	4.5	441507	4790753	639	G_53	13720	37.0	37.2	37.2	37.2	37.2	-	-	-	-	-	-
G_PR_1087	PR	4.5	448088	4793098	621	G_39	6740	36.9	37.1	37.2	37.2	37.2	-	-	-	-	-	-
G_PR_1200	PR	4.5	447755	4804428	887	G_07	11648	36.2	36.5	36.6	36.6	36.6	-	-	-	-	-	-
G_PR_1201	PR	4.5	448122	4804561	601	G_10	11547	37.6	37.8	37.9	37.9	37.9	-	-	-	-	-	-
G_PR_1202	PR	4.5	448105	4804620	617	G_10	11606	37.3	37.5	37.6	37.6	37.6	-	-	-	-	-	-
G_PR_1212	PR	4.5	447994	4803552	586	G_11	10802	38.3	38.5	38.6	38.6	38.6	-	-	-	-	-	-
G_PR_1220	PR	4.5	448162	4803315	539	G_11	10511	38.6	38.9	38.9	38.9	38.9	-	-	-	-	-	-
G_PR_1230	PR	4.5	448252	4802066	681	G_13	9491	37.6	37.8	37.9	37.9	37.9	-	-	-	-	-	-
G_PR_1359	PR	4.5	449445	4793859	775	G_81	5236	35.2	35.4	35.4	35.4	35.4	-	-	-	-	-	-
G_PR_1360	PR	4.5	449459	4793863	760	G_81	5222	35.3	35.5	35.5	35.5	35.5	-	-	-	-	-	-
G_PR_1365	PR	4.5	448825	4793293	939	G_39	5978	34.6	34.8	34.8	34.8	34.8	-	-	-	-	-	-
G_PR_1389	PR	4.5	449404	4791861	569	G_41	6024	37.7	38.0	38.0	38.0	38.0	-	-	-	-	-	-
G_PR_1394	PR	4.5	449644	4791574	750	G_41	5979	36.9	37.2	37.2	37.2	37.2	-	-	-	-	-	-
G_PR_1398	PR	4.5	449718	4791624	823	G_41	5890	36.7	36.9	37.0	37.0	37.0	-	-	-	-	-	-
G_PR_1401	PR	4.5	449867	4791093	813	G_68	6092	37.2	37.4	37.4	37.4	37.4	-	-	-	-	-	-
G_PR_1410	PR	4.5	449873	4790670	704	G_68	6365	37.0	37.2	37.3	37.3	37.3	-	-	-	-	-	-
G_PR_1412	PR	4.5	449975	4790684	602	G_68	6281	37.6	37.8	37.9	37.9	37.9	-	-	-	-	-	-
G_PR_1483	PR	4.5	451591	4792148	753	G_70	4101	37.7	37.9	37.9	37.9	37.9	-	-	-	-	-	-
G_PR_1524	PR	4.5	451250	4795453	604	G_71	3345	36.8	37.0	37.1	37.1	37.1	-	-	-	-	-	-
G_PR_1525	PR	4.5	451223	4795488	627	G_71	3377	36.5	36.7	36.8	36.8	36.8	-	-	-	-	-	-
G_PR_1544	PR	4.5	451132	4797733	1219	G_31	4400	32.3	32.5	32.6	32.6	32.6	-	-	-	-	-	-
G_PR_1606	PR	4.5	450209	4803972	593	G_72	9994	38.7	38.9	39.0	39.0	39.0	-	-	-	-	-	-
G_PR_1618	PR	4.5	449940	4804807	607	G_04	10863	38.7	38.9	39	39	39	-	-	-	-	-	-
G_PR_1627	PR	4.5	449897	4805604	648	G_02	11607	37.6	37.9	37.9	37.9	37.9	-	-	-	-	-	-
G_PR_1742	PR	4.5	451265	4805937	614	G_03	11446	37.9	38.1	38.2	38.2	38.2	-	-	-	-	-	-
G_PR_1743	PR	4.5	451257	4805829	511	G_03	11345	39.1	39.4	39.4	39.4	39.4	-	-	-	-	-	-
G_PR_1748	PR	4.5	451478	4805493	447	G_03	10960	39.8	40.1	40.1	40.1	40.1	-	-	-	-	-	-
G_PR_1752	PR	4.5	451756	4804847	511	G_05	10262	38.9	39.1	39.2	39.2	39.2	-	-	-	-	-	-
G_PR_1758	PR	4.5	451913	4804213	734	G_05	9609	36.8	37	37.1	37.1	37.1	-	-	-	-	-	-
G_PR_1810	PR	4.5	452797	4799872	431	G_34	5204	39.6	39.9	39.9	39.9	39.9	-	-	-	-	-	-
G_PR_1818	PR	4.5	453469	4800150	588	G_73	5288	39.5	39.7	39.7	39.7	39.7	-	-	-	-	-	-
G_PR_1825	PR	4.5	453507	4800005	538	G_67	5139	40.1	40.3	40.4	40.4	40.4	-	-	-	-	-	-
G_PR_1848	PR	4.5	452856	4797283	435	G_32	2869	40.1	40.3	40.4	40.4	40.4	-	-	-	-	-	-

Point of Reception ID	Class	Height (m)	UTM Coordinates		Distance to Nearest Turbine (m)	Nearest Turbine ID	Distance to Transformer Substation (m)	Calculated Noise Level at Selected Wind Speeds (dBA)					Noise Level Limit (dBA)					Compliant or Non-compliant*
			X (m)	Y (m)				6	7	8	9	10	6	7	8	9	10	
G_VPR_2416	VPR	4.5	438675	4788087	651	G_63	17315	38.8	39	39.1	39.1	39.1	-	-	-	-	-	-
G_VPR_2420	VPR	4.5	438798	4789310	833	G_58	16750	38.1	38.3	38.3	38.3	38.3	-	-	-	-	-	-
G_VPR_2437	VPR	4.5	439057	4790109	804	G_54	16250	38.4	38.6	38.6	38.6	38.6	-	-	-	-	-	-
G_VPR_2438	VPR	4.5	438903	4790183	677	G_84	16375	38.9	39.1	39.1	39.1	39.1	-	-	-	-	-	-
G_VPR_2439	VPR	4.5	439106	4790344	692	G_54	16134	38.6	38.8	38.9	38.9	38.9	-	-	-	-	-	-
G_VPR_2440	VPR	4.5	438938	4790565	534	G_84	16234	39.2	39.4	39.5	39.5	39.5	-	-	-	-	-	-
G_VPR_2564	VPR	4.5	454065	4800249	553	G_67	5297	37.9	38.1	38.1	38.1	38.1	-	-	-	-	-	-
G_VPR_2568	VPR	4.5	454778	4799081	769	G_65	4111	35.2	35.4	35.5	35.5	35.5	-	-	-	-	-	-
G_VPR_2575	VPR	4.5	453290	4796624	799	G_35	2081	37.8	38	38.1	38.1	38.1	-	-	-	-	-	-
G_VPR_2576	VPR	4.5	455253	4795134	536	G_75	710	38.5	38.7	38.7	38.7	38.7	-	-	-	-	-	-
G_VPR_2582	VPR	4.5	454955	4794129	862	G_50	934	37.7	37.9	38	38	38	-	-	-	-	-	-
G_VPR_2598	VPR	4.5	455503	4793828	724	G_50	1485	36.3	36.5	36.6	36.6	36.6	-	-	-	-	-	-
G_VPR_2601	VPR	4.5	453725	4792943	867	G_49	2198	37.7	37.9	38	38	38	-	-	-	-	-	-
G_VPR_2608	VPR	4.5	453806	4791216	620	G_77	3835	36.5	36.7	36.7	36.7	36.7	-	-	-	-	-	-
G_VPR_2613	VPR	4.5	451971	4790619	738	G_46	5068	35.8	36	36.1	36.1	36.1	-	-	-	-	-	-
G_VPR_2614	VPR	4.5	452009	4790468	691	G_46	5180	35.8	36	36.1	36.1	36.1	-	-	-	-	-	-
G_VPR_2618	VPR	4.5	451707	4792467	728	G_47	3800	38.1	38.4	38.4	38.4	38.4	-	-	-	-	-	-
G_VPR_2634	VPR	4.5	452807	4798013	479	G_31	3507	38.8	39	39.1	39.1	39.1	-	-	-	-	-	-
G_VPR_2645	VPR	4.5	451989	4803944	805	G_06	9330	35.7	35.9	36	36	36	-	-	-	-	-	-
G_VPR_2646	VPR	4.5	449959	4804424	715	G_72	10510	38.4	38.6	38.7	38.7	38.7	-	-	-	-	-	-
G_VPR_2649	VPR	4.5	449861	4805296	738	G_04	11340	37.8	38	38.1	38.1	38.1	-	-	-	-	-	-
G_VPR_2672	VPR	4.5	448477	4800353	755	G_15	8120	34.4	34.6	34.7	34.7	34.7	-	-	-	-	-	-
G_VPR_2673	VPR	4.5	448494	4800147	792	G_15	7972	34	34.2	34.2	34.2	34.2	-	-	-	-	-	-
G_VPR_2744	VPR	4.5	449887	4790942	733	G_68	6174	37.2	37.5	37.5	37.5	37.5	-	-	-	-	-	-
G_VPR_2752	VPR	4.5	449605	4791116	722	G_42	6282	37.5	37.7	37.7	37.7	37.7	-	-	-	-	-	-
G_VPR_2759	VPR	4.5	447756	4791074	810	G_78	7844	36.6	36.8	36.9	36.9	36.9	-	-	-	-	-	-
G_VPR_2762	VPR	4.5	447469	4791984	508	G_64	7697	39	39.2	39.2	39.2	39.2	-	-	-	-	-	-
G_VPR_2764	VPR	4.5	447536	4792370	775	G_64	7493	36.8	37	37.1	37.1	37.1	-	-	-	-	-	-
G_VPR_2766	VPR	4.5	449316	4793619	998	G_81	5417	34.2	34.4	34.5	34.5	34.5	-	-	-	-	-	-
G_VPR_2767	VPR	4.5	447579	4793554	434	G_39	7125	39.7	39.9	39.9	39.9	39.9	-	-	-	-	-	-
G_VPR_2795	VPR	4.5	448045	4802358	874	G_13	9847	36.1	36.3	36.4	36.4	36.4	-	-	-	-	-	-
G_VPR_2796	VPR	4.5	447883	4803520	701	G_11	10844	37.7	37.9	38	38	38	-	-	-	-	-	-
G_VPR_2863	VPR	4.5	446968	4795176	783	G_22	7596	38.7	38.9	39	39	39	-	-	-	-	-	-
G_VPR_2864	VPR	4.5	447005	4794947	696	G_66	7556	38.6	38.8	38.9	38.9	38.9	-	-	-	-	-	-
G_VPR_2865	VPR	4.5	447038	4794743	669	G_66	7526	38.4	38.6	38.7	38.7	38.7	-	-	-	-	-	-
G_VPR_2866	VPR	4.5	447076	4794527	711	G_66	7498	38	38.2	38.3	38.3	38.3	-	-	-	-	-	-
G_VPR_2867	VPR	4.5	445146	4794872	636	G_20	9415	38.6	38.9	38.9	38.9	38.9	-	-	-	-	-	-
G_VPR_2868	VPR	4.5	445018	4795341	672	G_20	9550	38.6	38.8	38.9	38.9	38.9	-	-	-	-	-	-
G_VPR_2878	VPR	4.5	447213	4793546	643	G_86	7486	38.3	38.5	38.6	38.6	38.6	-	-	-	-	-	-
G_VPR_2881	VPR	4.5	445181	4794137	666	G_21	9417	38.4	38.6	38.7	38.7	38.7	-	-	-	-	-	-
G_VPR_2885	VPR	4.5	443361	4792560	622	G_17	11457	36.3	36.5	36.6	36.6	36.6	-	-	-	-	-	-
G_VPR_2886	VPR	4.5	444414	4792693	442	G_17	10400	39.1	39.3	39.4	39.4	39.4	-	-	-	-	-	-
G_VPR_2897	VPR	4.5	446572	4790890	433	G_38	8973	41.8	42	42.1	42.1	42.1	-	-	-	-	-	-
G_VPR_2902	VPR	4.5	445437	4791470	846	G_38	9774	36.8	37	37.1	37.1	37.1	-	-	-	-	-	-
G_VPR_2906	VPR	4.5	443374	4792373	670	G_17	11486	35.8	36	36.1	36.1	36.1	-	-	-	-	-	-
G_VPR_2907	VPR	4.5	447627	4790892	624	G_78	8047	37.5	37.7	37.8	37.8	37.8	-	-	-	-	-	-
G_VPR_2913	VPR	4.5	441635	4790205	833	G_53	13778	34.7	34.9	35	35	35	-	-	-	-	-	-
G_VPR_2915	VPR	4.5	441539	4790651	635	G_53	13721	36.8	37	37.1	37.1	37.1	-	-	-	-	-	-
G_VPR_2922	VPR	4.5	443187	4792335	855	G_17	11676	34.6	34.9	34.9	34.9	34.9	-	-	-	-	-	-
G_VPR_2930	VPR	4.5	441419	4790176	998	G_53	13991	34.2	34.4	34.4	34.4	34.4	-	-	-	-	-	-
G_VPR_2945	VPR	4.5	444970	4794218	647	G_16	9621	38.1	38.3	38.4	38.4	38.4	-	-	-	-	-	-
G_VPR_2955	VPR	4.5	447776	4790935	779	G_78	7897	36.5	36.7	36.8	36.8	36.8	-	-	-	-	-	-
G_VPR_3007	VPR	4.5	451623	4792852	685	G_82	3625	38.1	38.3	38.4	38.4	38.4	-	-	-	-	-	-
G_VPR_3069	VPR	4.5	441504	4790133	971	G_53	13926	34.1	34.3	34.4	34.4	34.4	-	-	-	-	-	-
G_VPR_3084	VPR	4.5	448237	4801796	661	G_14	9301	37.4	37.6	37.6	37.6	37.6	-	-	-	-	-	-
G_VPR_9962	VPR	4.5	455460	4794635	822	G_75	961	36	36.2	36.2	36.2	36.2	-	-	-	-	-	-

Notes: POR – Non-participating Point of Reception
VPO – Non-participating Vacant Lot Point of Reception
PR – Participating Point of Reception
VPR – Participating Vacant Lot Point of Reception
C – Compliant
NC – Not Compliant

* The noise impact calculation was limited to source – point of reception distances of 5Km, in such cases the table entries were represented as dashes. Participating receptors are not subject to the MOE noise limits and in these cases the noise limit entries are represented as dashes as well. In either of the above cases assessment of compliance is not required and therefore this entry is also represented as a dash.

9. References

The following references were used in the preparation of this report:

PIBS 4709e, *Noise Guidelines for Wind Farms – Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities*, Ontario Ministry of the Environment, Queens Printer for Ontario, October 2008.

IEC 61400-11, *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*, International Electrotechnical Commission, 2006.

ANSI C57.12.90 (IEEE C57.12.90-1993), *IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and IEEE Guide for Short-Circuit Testing of Distribution and Power Transformers*, Institute of Electrical and Electronics Engineers, Inc., 1993.

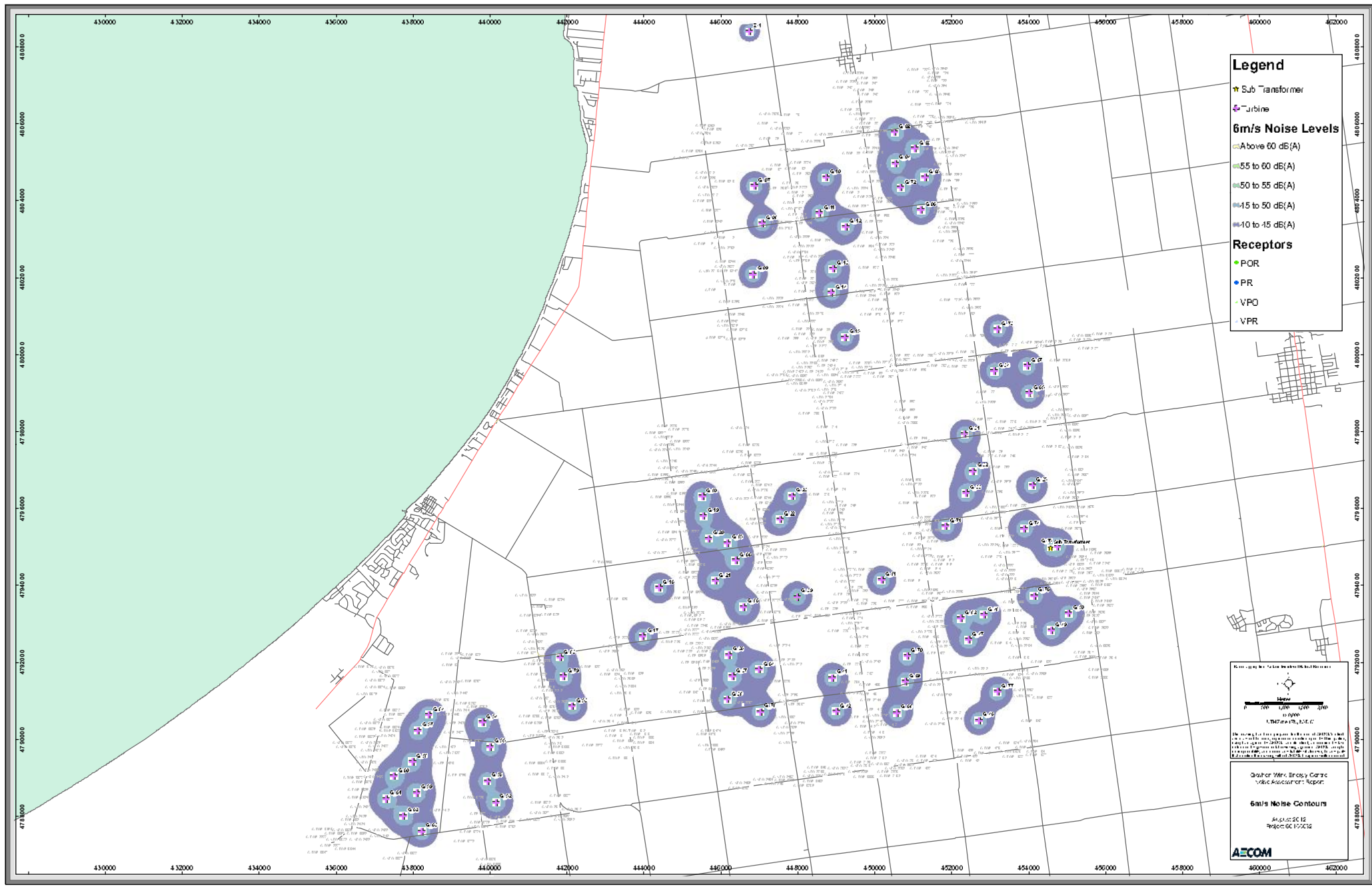
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Appendix A: Site Plan

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Appendix B: Noise Contour Maps

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Legend

- ★ Sub Transformer
- ★ Turbine

6m/s Noise Levels

- Above 60 dB(A)
- 55 to 60 dB(A)
- 50 to 55 dB(A)
- 45 to 50 dB(A)
- 40 to 45 dB(A)

Receptors

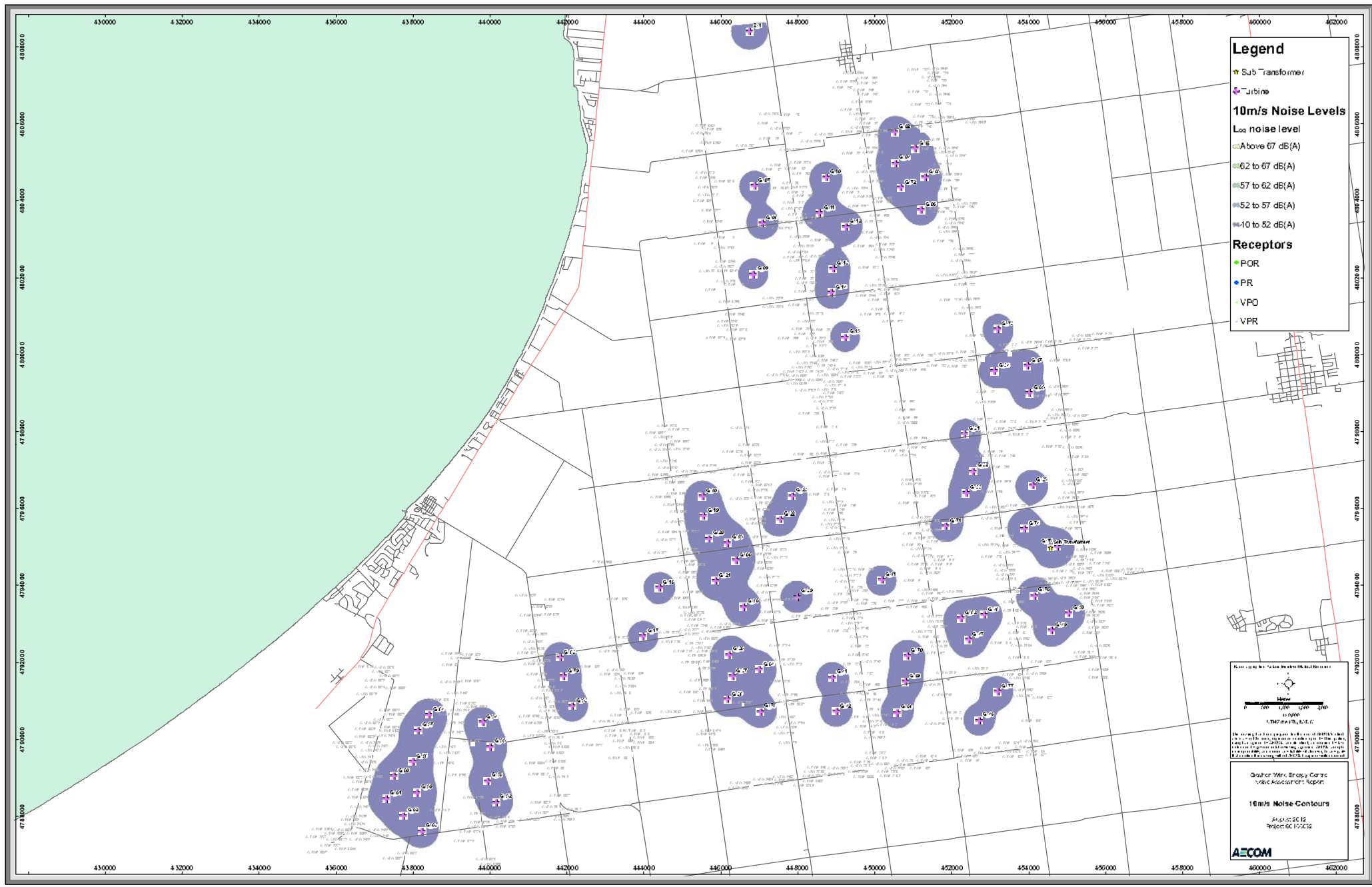
- POR
- PR
- VPO
- VPR

Scale 1:10,000

North Arrow

6m/s Noise Contours

AECOM



Legend

- Sub Transformer
- Turbine
- 10m/s Noise Levels**
- Loa noise level
- Above 67 dB(A)
- 62 to 67 dB(A)
- 57 to 62 dB(A)
- 52 to 57 dB(A)
- 40 to 52 dB(A)
- Receptors**
- POR
- PR
- VPO
- VPR

North arrow and scale bar (0 to 2000 meters).

1:10,000

Greater Merit Energy Centre
Noise Assessment Report

10m/s Noise Contours

AS 6102:2015
Revision 06/12/2012

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Appendix C: Sample Calculations

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Appendix D: Equipment Noise Emission Data

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Technical Description of the 1.56-100 Wind Turbine and Major Components

The wind turbine is a three bladed, upwind, horizontal-axis wind turbine with a rotor diameter of 100 m. The turbine rotor and nacelle are mounted on top of a tubular tower giving a rotor hub height of 80m. The machine employs active yaw control (designed to steer the machine with respect to the wind direction), active blade pitch control (designed to regulate turbine rotor speed), and a generator/power electronic converter system.

The wind turbine features a distributed drive train design wherein the major drive train components including main shaft bearings, gearbox, generator, yaw drives, and control panel are attached to a bedplate (see Figure 1).

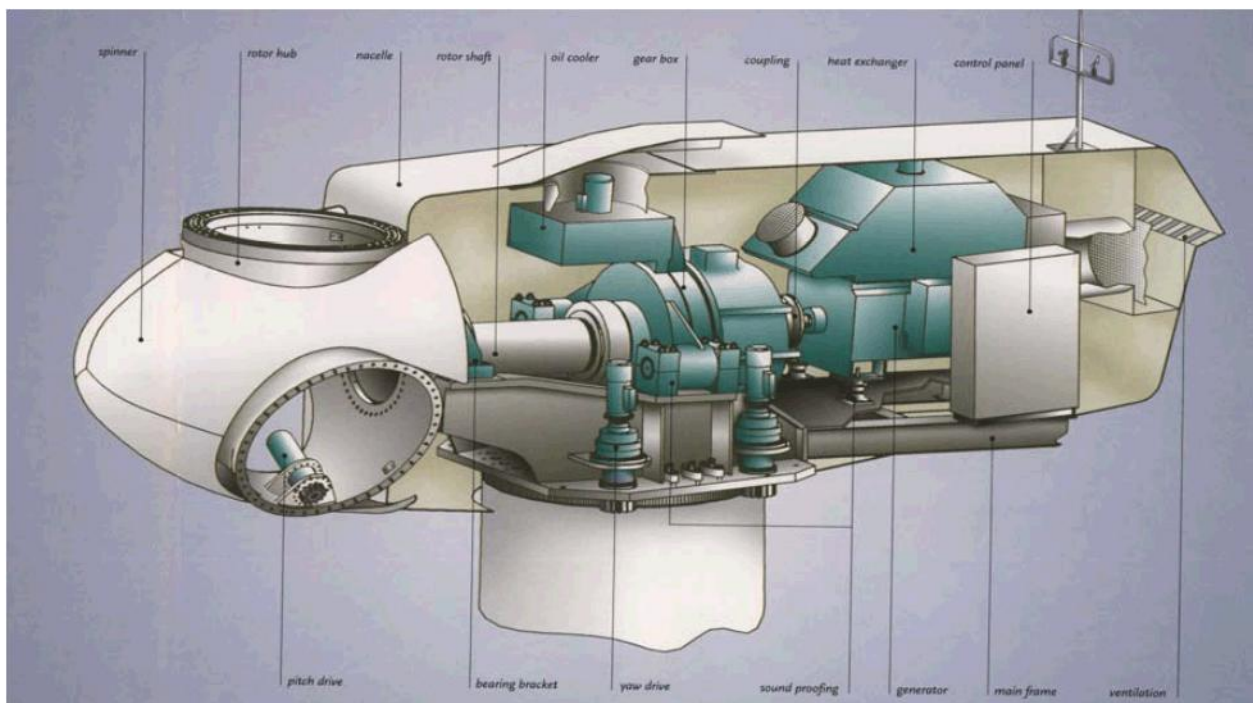


Figure 1: GE Energy 1.56-100 wind turbine nacelle layout

Rotor

The rotor diameter is 100 m, resulting in a swept area of 7,854 m², and is designed to operate between 9.75 and 16.18 revolutions per minute (rpm). Rotor speed is regulated by a combination of blade pitch angle adjustment and generator/converter torque control. The rotor spins in a clockwise direction under normal operating conditions when viewed from an upwind location.

Full blade pitch angle range is approximately 90°, with the 0°-position being with the airfoil chord line flat to the prevailing wind. The blades being pitched to a full feather pitch angle of approximately 90° accomplishes aerodynamic braking of the rotor; whereby the blades "spill" the wind thus limiting rotor speed.

Blades

There are three rotor blades used on each wind turbine. The airfoils transition along the blade span with the thicker airfoils being located in-board towards the blade root (hub) and gradually tapering to thinner cross sections out towards the blade tip.

Blade Pitch Control System

The rotor utilizes three (one for each blade) independent electric pitch motors and controllers to provide adjustment of the blade pitch angle during operation. Blade pitch angle is adjusted by an electric drive that is mounted inside the rotor hub and is coupled to a ring gear mounted to the inner race of the blade pitch bearing (see Figure 1).

GE's active-pitch controller enables the wind turbine rotor to regulate speed, when above rated wind speed, by allowing the blade to "spill" excess aerodynamic lift. Energy from wind gusts below rated wind speed is captured by allowing the rotor to speed up, transforming this gust energy into kinetic which may then be extracted from the rotor.

Three independent back-up units are provided to power each individual blade pitch system to feather the blades and shut down the machine in the event of a grid line outage or other fault. By having all three blades outfitted with independent pitch systems, redundancy of individual blade aerodynamic braking capability is provided.

Hub

The hub is used to connect the three rotor blades to the turbine main shaft. The hub also houses the three electric blade pitch systems and is mounted directly to the main shaft. Access to the inside of the hub is provided through a hatch.

Gearbox

The gearbox in the wind turbine is designed to transmit power between the low-rpm turbine rotor and high-rpm electric generator. The gearbox is a multi-stage planetary/helical gear design. The gearbox is mounted to the machine bedplate. The gearing is designed to transfer torsional power from the wind turbine rotor to the electric generator. A parking brake is mounted on the high-speed shaft of the gearbox.

Bearings

The blade pitch bearing is designed to allow the blade to pitch about a span-wise pitch axis. The inner race of the blade pitch bearing is outfitted with a blade drive gear that enables the blade to be driven in pitch by an electric gear-driven motor/controller.

The main shaft bearing is a roller bearing mounted in a pillow-block housing arrangement. The bearings used inside the gearbox are of the cylindrical, spherical and tapered roller type. These bearings are designed to provide bearing and alignment of the internal gearing shafts and accommodate radial and axial loads.

Brake System

The electrically actuated individual blade pitch systems act as the main braking system for the wind turbine. Braking under normal operating conditions is accomplished by feathering the blades out of the wind. Any single feathered rotor blade is designed to slow the rotor, and each rotor blade has its own back-up to provide power to the electric drive in the event of a grid line loss.

The turbine is also equipped with a mechanical brake located at the output (high-speed) shaft of the gearbox. This brake is only applied as an auxiliary brake to the main aerodynamic brake and to prevent rotation of the machinery as required by certain service activities.

Generator

The generator is a doubly-fed induction type. The generator meets protection class requirements of the International Standard IP 54 (totally enclosed). The generator is mounted to the bedplate and the mounting is designed so as to reduce vibration and noise transfer to the bedplate.

Flexible Coupling

Designed to protect the drive train from excessive torque loads, a flexible coupling is provided between the generator and gearbox output shaft this is equipped with a torque-limiting device sized to keep the maximum allowable torque below the maximum design limit of the drive train.

Yaw System

A roller bearing attached between the nacelle and tower facilitates yaw motion. Planetary yaw drives (with brakes that engage when the drive is disabled) mesh with the outside gear of the yaw bearing and steer the machine to track the wind in yaw. The automatic yaw brakes engage in order to prevent the yaw drives from seeing peak loads from any turbulent wind.

The controller activates the yaw drives to align the nacelle to the average wind direction based on the wind vane sensor mounted on top of the nacelle.

A cable twist sensor provides a record of nacelle yaw position and cable twisting. After the sensor detects excessive rotation in one direction, the controller automatically brings the rotor to a complete stop, untwists the cable by counter yawing of the nacelle, and restarts the wind turbine.

Tower

The wind turbine is mounted on top of a tubular tower. The tubular tower is manufactured in sections from steel plate. Access to the turbine is through a lockable steel door at the base of the tower. Service platforms are provided. Access to the nacelle is provided by a ladder and a fall arresting safety system is included. Interior lights are installed at critical points from the base of the tower to the tower top.

Nacelle

The nacelle houses the main components of the wind turbine generator. Access from the tower into the nacelle is through the bottom of the nacelle. The nacelle is ventilated. It is illuminated with electric light. A hatch at the front end of the nacelle provides access to the blades and hub. The rotor can be secured in place with a rotor lock.

Anemometer, Wind Vane and Lightning Rod

An anemometer, wind vane and lightning rod are mounted on top of the nacelle housing. Access to these sensors is accomplished through a hatch in the nacelle roof.

Lightning Protection

The rotor blades are equipped with a lightning receptors mounted in the blade. The turbine is grounded and shielded to protect against lightning, however, lightning is an unpredictable force of nature, and it is possible that a lightning strike could damage various components notwithstanding the lightning protection deployed in the machine.

Wind Turbine Control System

The wind turbine machine can be controlled automatically or manually from either an interface located inside the nacelle or from a control box at the bottom of the tower. Control signals can also be sent from a remote computer via a Supervisory Control and Data Acquisition System (SCADA), with local lockout capability provided at the turbine controller.

Service switches at the tower top prevent service personnel at the bottom of the tower from operating certain systems of the turbine while service personnel are in the nacelle. To override any machine operation, Emergency-stop buttons located in the tower base and in the nacelle can be activated to stop the turbine in the event of an emergency.

Power Converter

The wind turbine uses a power converter system that consists of a converter on the rotor side, a DC intermediate circuit, and a power inverter on the grid side.

The converter system consists of a power module and the associated electrical equipment. Variable output frequency of the converter allows operation of the generator.

Technical Data for the 1.56-100

Rotor

Diameter	100 m
Number of blades	3
Swept area	7,854 m ²
Rotor speed range	9.75 to 16.18 rpm
Rotational direction	Clockwise looking downwind
Maximum tip speed	84.7 m/s
Orientation	Upwind
Speed regulation	Pitch control
Aerodynamic brakes	Full feathering

Pitch System

Principle	Independent blade pitch control
Actuation	Individual electric drive

Yaw System

Yaw rate	0.5 degree/s
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1.56-100 Calculated Octave Band Spectra – Canada Specific

Table 1 below provides simulated, A-weighted octave band spectra as a function of standardized wind speed at 10 m height, and expressed as apparent sound power levels. The uncertainties for octave sound power levels are generally higher than for total sound power levels. Guidance is given in IEC 61400-11, Annex D.

1.56-100 Octave Band Spectra									
Standard WS at 10m [m/s]	5	5.5	6	6.5	7	8	9	10-Cutout	
Hub Height WS at 100m [m/s]	7.2	7.9	8.6	9.3	10	11.5	12.9	14-Cutout	
Frequency [Hz]	32	71.2	74.2	76.5	78.8	80.9	81.5	81.5	81.5
	63	80.9	83.9	86.2	88.4	90.5	91.2	91.2	91.2
	125	85.4	88.2	90.1	92.1	94.2	94.8	94.9	94.8
	250	89.1	91.6	91.9	92.5	93.9	94.2	94.2	94.2
	500	90.4	93.3	94.6	95.4	95.7	94.6	94.5	94.5
	1000	88.1	91.4	95.2	98.2	99.6	99.1	98.9	98.8
	2000	85.8	87.7	91.3	94.8	97.2	98	98.1	98.2
	4000	81.4	82.8	84.6	86.5	88.4	88.8	89.2	89.5
	8000	65.9	66.5	68	69.6	71.1	71.2	70.7	70.5
	16000	26.8	24.7	25.9	28.2	30.5	31.8	31.1	31.2
Lwa [dBA]	95.5	98.3	100.4	102.5	104	104	104	104	104

Table 1: Octave Spectra for 1.56-100 - hub height wind speeds were calculated based on equation (7) from IEC standard 61400-11:2002, using a representative roughness height of 0.05 m

1.56-100 Normal Operation Calculated Tonal Audibility – Canada Specific

The nominal acoustic performances for 1.56-100, 60 Hz version equipped with 100 m rotor diameter (GE 48.7 type blade) operating in normal operation (NO), specified at reference ground measuring distance Ro measurement point #1 per both IEC 61400-11 and GE's "Machine noise performance test" reference guidelines:

- Tonal audibility $\Delta L_{a,k} \leq 2$ dB.

1.56-100 Testing Uncertainty and Product Variation per IEC/TS 61400-14 Standard

Per IEC/TS 61400-14, $L_{WA,d}$ is the maximum apparent sound power level resulting from n measurements performed according to IEC 61400-11 standard for 95 % confidence level: $L_{WA,d} = \overline{L_{WA}} + K$, where $\overline{L_{WA}}$ is the mean apparent sound power level from n IEC 61400-11 testing reports and $K = 1,645 \cdot \sigma_T$.

The testing standard deviation values σ_T , σ_R and σ_P for measured apparent sound power level are described by IEC/TS 61400-14 where σ_T is the total standard deviation, σ_P is the standard deviation for product variation and σ_R is the standard deviation for test reproducibility.

Assuming $\sigma_R < 0.8$ dB and $\sigma_P < 0.8$ dB typical values, leads to calculated $K < 2$ dB for 95 % confidence level.

IEC 61400-11 and IEC/TS 61400-14 Terminology

- $L_{WA,k}$ is wind turbine apparent sound power level (referenced to 1^{12} W) measured with A-weighting as function of reference wind speed v_{10m} . Derived from multiple measurement reports per IEC 61400-11, it is considered as a mean value.
- σ_P is the product variation i.e. the 1.56-100 unit-to-unit product variation; typically < 0.8 dB
- σ_R is the overall measurement testing reproducibility as defined per IEC 61400-11; typically < 0.8 dB with adequate measurement conditions and sufficient amount of data samples
- σ_T is the total standard deviation combining both σ_P and σ_R

- $K = 1,645 \cdot \sigma_T$ is defined by IEC/TS 61400-14 for 95 % confidence level
- R_0 is the ground measuring distance from the wind turbine tower axis per IEC 61400-11
- $\Delta L_{a,k}$ is the tonal audibility according to IEC 61400-11, described as potentially audible narrow band sound

Technical Description of the 1.6-100 Wind Turbine with Low-Noise Trailing Edges (LNTE's) and Major Components

The wind turbine is a three bladed, upwind, horizontal-axis wind turbine with a rotor diameter of 100 m. The turbine rotor and nacelle are mounted on top of a tubular tower giving a rotor hub height of 80m. The machine employs active yaw control (designed to steer the machine with respect to the wind direction), active blade pitch control (designed to regulate turbine rotor speed), and a generator/power electronic converter system.

The wind turbine features a distributed drive train design wherein the major drive train components including main shaft bearings, gearbox, generator, yaw drives, and control panel are attached to a bedplate (see Figure 1).

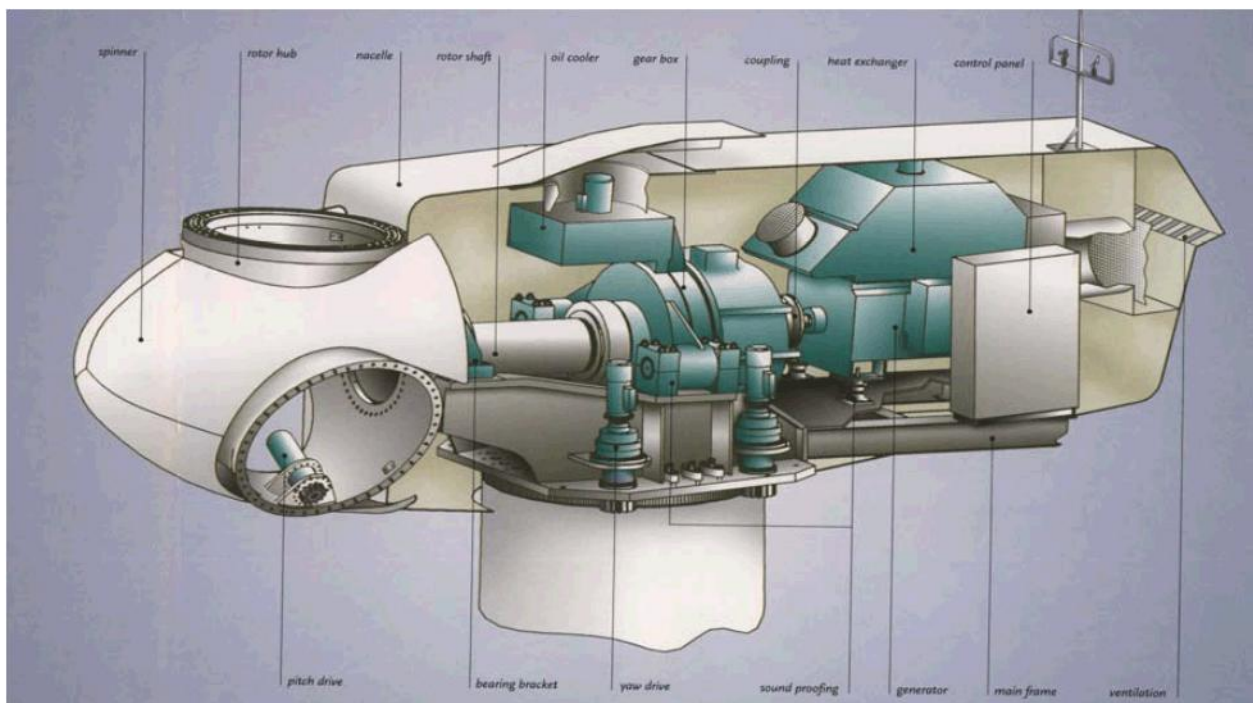


Figure 1: GE Energy 1.6-100 wind turbine nacelle layout

Rotor

The rotor diameter is 100 m, resulting in a swept area of 7,854 m², and is designed to operate between 9.75 and 15.33 revolutions per minute (rpm). Rotor speed is regulated by a combination of blade pitch angle adjustment and generator/converter torque control. The rotor spins in a clock-wise direction under normal operating conditions when viewed from an upwind location.

Full blade pitch angle range is approximately 90°, with the 0°-position being with the airfoil chord line flat to the prevailing wind. The blades being pitched to a full feather pitch angle of approximately 90° accomplishes aerodynamic braking of the rotor; whereby the blades "spill" the wind thus limiting rotor speed.

Blades

There are three rotor blades used on each wind turbine. The airfoils transition along the blade span with the thicker airfoils being located in-board towards the blade root (hub) and gradually tapering to thinner cross sections out towards the blade tip.

Blade Pitch Control System

The rotor utilizes three (one for each blade) independent electric pitch motors and controllers to provide adjustment of the blade pitch angle during operation. Blade pitch angle is adjusted by an electric drive that is mounted inside the rotor hub and is coupled to a ring gear mounted to the inner race of the blade pitch bearing (see Figure 1).

GE's active-pitch controller enables the wind turbine rotor to regulate speed, when above rated wind speed, by allowing the blade to "spill" excess aerodynamic lift. Energy from wind gusts below rated wind speed is captured by allowing the rotor to speed up, transforming this gust energy into kinetic which may then be extracted from the rotor.

Three independent back-up units are provided to power each individual blade pitch system to feather the blades and shut down the machine in the event of a grid line outage or other fault. By having all three blades outfitted with independent pitch systems, redundancy of individual blade aerodynamic braking capability is provided.

Hub

The hub is used to connect the three rotor blades to the turbine main shaft. The hub also houses the three electric blade pitch systems and is mounted directly to the main shaft. Access to the inside of the hub is provided through a hatch.

Gearbox

The gearbox in the wind turbine is designed to transmit power between the low-rpm turbine rotor and high-rpm electric generator. The gearbox is a multi-stage planetary/helical gear design. The gearbox is mounted to the machine bedplate. The gearing is designed to transfer torsional power from the wind turbine rotor to the electric generator. A parking brake is mounted on the high-speed shaft of the gearbox.

Bearings

The blade pitch bearing is designed to allow the blade to pitch about a span-wise pitch axis. The inner race of the blade pitch bearing is outfitted with a blade drive gear that enables the blade to be driven in pitch by an electric gear-driven motor/controller.

The main shaft bearing is a roller bearing mounted in a pillow-block housing arrangement. The bearings used inside the gearbox are of the cylindrical, spherical and tapered roller type. These bearings are designed to provide bearing and alignment of the internal gearing shafts and accommodate radial and axial loads.

Brake System

The electrically actuated individual blade pitch systems act as the main braking system for the wind turbine. Braking under normal operating conditions is accomplished by feathering the blades out of the wind. Any single feathered rotor blade is designed to slow the rotor, and each rotor blade has its own back-up to provide power to the electric drive in the event of a grid line loss.

The turbine is also equipped with a mechanical brake located at the output (high-speed) shaft of the gearbox. This brake is only applied as an auxiliary brake to the main aerodynamic brake and to prevent rotation of the machinery as required by certain service activities.

Generator

The generator is a doubly-fed induction type. The generator meets protection class requirements of the International Standard IP 54 (totally enclosed). The generator is mounted to the bedplate and the mounting is designed so as to reduce vibration and noise transfer to the bedplate.

Flexible Coupling

Designed to protect the drive train from excessive torque loads, a flexible coupling is provided between the generator and gearbox output shaft this is equipped with a torque-limiting device sized to keep the maximum allowable torque below the maximum design limit of the drive train.

Yaw System

A roller bearing attached between the nacelle and tower facilitates yaw motion. Planetary yaw drives (with brakes that engage when the drive is disabled) mesh with the outside gear of the yaw bearing and steer the machine to track the wind in yaw. The automatic yaw brakes engage in order to prevent the yaw drives from seeing peak loads from any turbulent wind.

The controller activates the yaw drives to align the nacelle to the average wind direction based on the wind vane sensor mounted on top of the nacelle.

A cable twist sensor provides a record of nacelle yaw position and cable twisting. After the sensor detects excessive rotation in one direction, the controller automatically brings the rotor to a complete stop, untwists the cable by counter yawing of the nacelle, and restarts the wind turbine.

Tower

The wind turbine is mounted on top of a tubular tower. The tubular tower is manufactured in sections from steel plate. Access to the turbine is through a lockable steel door at the base of the tower. Service platforms are provided. Access to the nacelle is provided by a ladder and a fall arresting safety system is included. Interior lights are installed at critical points from the base of the tower to the tower top.

Nacelle

The nacelle houses the main components of the wind turbine generator. Access from the tower into the nacelle is through the bottom of the nacelle. The nacelle is ventilated. It is illuminated with electric light. A hatch at the front end of the nacelle provides access to the blades and hub. The rotor can be secured in place with a rotor lock.

Anemometer, Wind Vane and Lightning Rod

An anemometer, wind vane and lightning rod are mounted on top of the nacelle housing. Access to these sensors is accomplished through a hatch in the nacelle roof.

Lightning Protection

The rotor blades are equipped with a lightning receptors mounted in the blade. The turbine is grounded and shielded to protect against lightning, however, lightning is an unpredictable force of nature, and it is possible that a lightning strike could damage various components notwithstanding the lightning protection deployed in the machine.

Wind Turbine Control System

The wind turbine machine can be controlled automatically or manually from either an interface located inside the nacelle or from a control box at the bottom of the tower. Control signals can also be sent from a remote computer via a Supervisory Control and Data Acquisition System (SCADA), with local lockout capability provided at the turbine controller.

Service switches at the tower top prevent service personnel at the bottom of the tower from operating certain systems of the turbine while service personnel are in the nacelle. To override any machine operation, Emergency-stop buttons located in the tower base and in the nacelle can be activated to stop the turbine in the event of an emergency.

Power Converter

The wind turbine uses a power converter system that consists of a converter on the rotor side, a DC intermediate circuit, and a power inverter on the grid side.

The converter system consists of a power module and the associated electrical equipment. Variable output frequency of the converter allows operation of the generator.

Technical Data for the 1.6-100 with LNTE

Rotor

Diameter	100 m
Number of blades	3
Swept area	7,854 m ²
Rotor speed range	9.75 to 15.33 rpm
Rotational direction	Clockwise looking downwind
Maximum tip speed	80.3 m/s
Orientation	Upwind
Speed regulation	Pitch control
Aerodynamic brakes	Full feathering

Pitch System

Principle	Independent blade pitch control
Actuation	Individual electric drive

Yaw System

Yaw rate	0.5 degree/s
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1.6-100 with LNTE Calculated 1/3rd Octave Band Apparent Sound Power Level LWA,k

Table 1 provides reference values per IEC 61400-11, based on the total apparent sound power level (A-weighted) defined in the general product acoustic specification for this turbine type. The uncertainties for octave sound power levels are generally higher than for total sound power levels. Guidance is given in IEC 61400-11, Annex D. The third octave-band spectra are for information only.

1.6-100 LNTE with 80 m HH - Normal Operation 1/3 rd Octave Band Spectra									
Standard WS at 10m [m/s]		5.0	5.5	6.0	6.5	7.0	8.0	9.0	10-Cutout
Hub Height WS at 80 m [m/s]		7.0	7.7	8.4	9.1	9.7	11.1	12.5	14-Cutout
Frequency [Hz]	25	61.8	63.9	65.7	67.5	69.2	69.8	69.9	69.8
	32	66.2	68.3	70.1	71.9	73.7	74.2	74.3	74.2
	40	70.2	72.3	74.2	75.9	77.7	78.2	78.3	78.2
	50	73.4	75.5	77.4	79.2	80.9	81.4	81.5	81.4
	63	76.3	78.4	80.4	82.2	84.0	84.4	84.5	84.4
	80	78.6	80.8	82.8	84.7	86.6	87.0	87.0	86.9
	100	80.5	82.7	84.7	86.6	88.4	88.8	88.8	88.7
	125	81.7	83.9	85.9	87.6	89.2	89.6	89.7	89.6
	160	82.8	85.1	87.2	88.4	89.7	90.2	90.3	90.2
	200	84.0	86.3	88.5	89.2	90.1	90.4	90.5	90.5
	250	85.0	87.4	89.7	89.9	90.3	90.4	90.5	90.5
	315	85.6	88.2	90.5	90.5	90.4	90.2	90.3	90.4
	400	85.4	88.1	90.6	90.7	90.8	90.4	90.5	90.7
	500	85.1	87.8	90.5	91.2	91.6	91.3	91.4	91.7
	630	84.0	86.7	89.4	90.9	92.2	92.0	92.1	92.5
	800	82.3	84.8	87.3	89.7	91.9	92.0	92.1	92.5
	1000	81.7	83.8	85.9	88.8	91.6	92.1	92.2	92.5
	1250	82.4	84.3	86.1	88.7	91.4	92.2	92.4	92.4
	1600	82.8	84.8	86.5	88.5	90.7	91.4	91.4	90.9
	2000	83.3	85.4	87.3	88.8	90.3	90.4	90.0	89.4
	2500	83.4	85.6	87.6	88.7	89.7	89.1	88.5	87.9
	3150	81.8	84.2	86.4	86.8	87.3	86.7	86.2	85.3
	4000	77.7	80.6	83.0	82.8	82.9	83.0	82.0	81.4
	5000	72.0	75.1	77.5	77.0	77.3	77.6	76.2	76.0
	6300	63.3	66.5	69.5	69.0	69.4	69.7	68.5	68.4
	8000	51.0	53.9	56.9	57.1	57.9	58.3	57.3	57.0
	10000	36.5	39.1	42.0	42.7	43.9	43.9	43.8	44.1
	12500	18.9	21.5	24.1	25.3	26.5	26.0	26.9	28.8
	16000	-6.1	-3.3	-0.8	0.3	1.2	1.2	3.4	6.4
	20000	-34.1	-30.5	-27.4	-26.9	-26.6	-25.2	-22.4	-18.9
Total apparent sound power level L _{WA,k} [dB]		95.8	98.2	100.5	101.6	102.8	103.0	103.0	103.0

Table 1: Calculated Apparent Third Octave Band Sound Power Level (A-weighted), 1.6-100 LNTE with 80 m hub height as function of Wind Speed v_{10m}

Tonal Audibility

At the reference measuring point R_0 , a ground distance from the turbine tower vertical centerline equal to hub height plus half the rotor diameter (reference IEC 61400-11), the 16-100 turbine has an expected value for tonal audibility of $\Delta L_{a,k} < 2$ dB, irrespective of wind speed, hub height, and grid frequency.

Uncertainty Levels

The apparent sound power levels given above are calculated mean levels. If a wind turbine noise performance test is carried out, it needs to be done in accordance with the regulations of the international standard IEC 61400-11, ed. 2.1: 2006. Uncertainty levels associated with measurements are described in IEC/TS 61400-14.

Per IEC/TS 61400-14, $L_{WA,d}$ is the maximum apparent sound power level resulting from n measurements performed according to IEC 61400-11 standard for 95 % confidence level: $L_{WA,d} = \overline{L_{WA}} + K$, where $\overline{L_{WA}}$ is the mean apparent sound power level from n IEC 61400-11 testing reports and $K = 1.645 \cdot \sigma_T$.

The testing standard deviation values σ_T , σ_R and σ_P for measured apparent sound power level are described by IEC/TS 61400-14 where σ_T is the total standard deviation, σ_P is the standard deviation for product variation and σ_R is the standard deviation for test reproducibility.

Assuming $\sigma_R < 0.8$ dB and $\sigma_P < 0.8$ dB typical values, leads to calculated $K < 2$ dB for 95 % confidence level.

IEC 61400-11 and IEC/TS 61400-14 Terminology

- $L_{WA,k}$ is wind turbine apparent sound power level (referenced to 10^{-12} W) measured with A-weighting as function of reference wind speed v_{10m} . Derived from multiple measurement reports per IEC 61400-11, it is considered as a mean value.
- σ_P is the product variation i.e. the 16-100 with LNTE unit-to-unit product variation; typically < 0.8 dB
- σ_R is the overall measurement testing reproducibility as defined per IEC 61400-11; typically < 0.8 dB with adequate measurement conditions and sufficient amount of data samples
- σ_T is the total standard deviation combining both σ_P and σ_R
- $K = 1.645 \cdot \sigma_T$ is defined by IEC/TS 61400-14 for 95 % confidence level
- R_0 is the ground measuring distance from the wind turbine tower vertical axis per IEC 61400-11
- $\Delta L_{a,k}$ is the tonal audibility according to IEC 61400-11, described as potentially audible narrow band sound

Extract I of test report

Extract 1 Page 1 of 2

Master Information „Noise“, according to “Wind turbine generator systems - Part 11: Acoustic noise measurement techniques.”

IEC 61400-11 ED. 2 from 2002 (published by: Central Office of the IEC, Geneva, Switzerland)

Extract of test report WICO 439SEC04/07 regarding noise emission of wind turbine (WT)
type ENERCON E-48 (Mode I), hub height 75.6 m

General			Technical specifications (manufacturer)	
Manufacturer:	ENERCON GmbH Dreekamp 5 D-26605 AURICH		Rated power (generator):	800 kW
			Rotor diameter:	48,0 m
			Hub height above ground:	75,6 m
Serial number:	48087		Kon. Stahlrohr	Tubular steel tower
WT-location:	WP Holtriem	RW 25.95.228	Pitch	pitch/stall/active-stall
		HW 59.42.988		
Complementations of rotor (manufacturer)			Complementations of gear and generator (manufacturer)	
Manufacturer of rotor blades	ENERCON GmbH		Manufacturer of gear:	No
Type of blades:	E48/1		Type of gear:	No
Pitch angle:	variabel		Manufacturer of generator:	ENERCON GmbH
Number of blades	3		Type of generator:	E-48
Rated speed(s)/speed range:	16 – 29,5 rpm (Mode I)		Rated speed(s):	16 – 29,5 rpm (Mode I)
Report power curve: calculated power curve, date: 31.08.2004				
	Reference		Noise emission parameter	Remarks
	Standardized wind speed at 10 m above ground	Electric power		
Sound power level L_{WA}	5 ms^{-1}	182 kW	94.0* dB(A)	(1)
	6 ms^{-1}	315 kW	97.8 dB(A)	
	7 ms^{-1}	499 kW	100.3 dB(A)	
	8 ms^{-1}	671 kW	101.4 dB(A)	
	8.9 ms^{-1}	760 kW	101.9 dB(A)	(2)
	9 ms^{-1}	765 kW	102.0 dB(A)	
	9.6 ms^{-1}	794 kW	102.1 dB(A)	(3)
	10 ms^{-1}	800 kW	101.9 dB(A)	(4)
Tonal components ΔL_a (near proximity)	5 ms^{-1}	182 kW	No tone	(1)
	6 ms^{-1}	315 kW	No tone	
	7 ms^{-1}	499 kW	No tone	
	8 ms^{-1}	671 kW	No tone	
	8.9 ms^{-1}	760 kW	No tone	(2)
	9 ms^{-1}	765 kW	No tone	
	9.6 ms^{-1}	794 kW	No tone	(3)
	10 ms^{-1}	800 kW	No tone	(4)

One third octave sound power level at reference point $v_{10} = 5$ m/s [dB(A)]

Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA}	67.6	71.2	72.9	74.5	78.0	77.0	79.3	84.2	85.6	84.6	84.2	84.4
L_{WA}	75.8			81.5			88.5			89.2		
Frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA}	82.6	82.0	81.4	79.2	78.5	76.6	75.2	74.8	73.1	72.4	70.9	67.4
L_{WA}	86.8			83.0			79.2			75.5		

One third octave sound power level at reference point $v_{10} = 6$ m/s [dB(A)]

Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA}	71.7	74.2	76.9	77.6	78.8	79.7	80.6	86.1	87.8	87.4	87.4	89.0
L_{WA}	79.5			83.6			90.5			92.8		
Frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA}	88.3	88.1	86.9	84.0	82.4	80.9	79.4	79.0	78.1	77.3	74.9	72.9
L_{WA}	92.6			87.4			83.6			80.2		



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One third octave sound power level at reference point $v_{10} = 7 \text{ m/s}$ [dB(A)]												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA}	72.7	76.1	79.3	80.5	80.9	82.9	84.3	89.2	91.2	90.7	90.5	91.5
L_{WA}	81.6			86.3			93.8			95.7		
Frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA}	90.2	89.7	87.9	85.5	84.1	82.6	81.7	81.6	80.7	80.2	79.2	76.3
L_{WA}	94.1			89.0			86.1			83.6		

One third octave sound power level at reference point $v_{10} = 8 \text{ m/s}$ [dB(A)]												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA}	70.1	74.3	77.3	79.0	81.7	82.3	84.4	90.5	92.7	92.0	91.9	92.9
L_{WA}	79.6			86.0			95.1			97.1		
Frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA}	91.7	90.9	89.1	86.0	83.9	82.1	80.9	81.6	80.6	79.7	79.2	77.3
L_{WA}	95.5			89.1			85.8			83.6		

One third octave sound power level at reference point $v_{10} = 9 \text{ m/s}$ [dB(A)]												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA}	71.8	74.5	77.1	79.4	82.6	84.2	86.6	91.5	93.5	92.6	92.3	93.1
L_{WA}	79.8			87.3			96.1			97.5		
Frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA}	91.4	90.5	88.7	86.2	85.0	84.3	83.9	84.4	83.9	83.7	82.5	80.1
L_{WA}	95.1			90.0			88.8			87.1		

One third octave sound power level at reference point $v_{10} = 9.6 \text{ m/s}$ [dB(A)]												
Frequency	50	63	80	100	125	160	200	250	315	400	500	630
L_{WA}	69.9	73.9	75.9	77.4	80.2	80.7	83.4	88.3	91.0	90.8	91.5	93.4
L_{WA}	78.6			84.4			93.3			96.8		
Frequency	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
L_{WA}	93.2	93.6	92.6	89.9	87.4	85.0	83.2	83.3	82.0	81.1	79.9	77.8
L_{WA}	97.9			92.7			87.6			84.6		

- (1) Because of the signal to noise ratio laying in between 3 dB to 6 dB the sound pressure level was corrected with 1.3 dB.
- (2) Sound power level at 95% of the rated power.
- (3) Wind speed at the maximum sound pressure level minute measured.
- (4) One value was measured in the wind bin of 10 ms^{-1} .

This extract of test report is valid only in connection with the enclosed „Manufacturer's certificate“ from 2004-08-31.

This declaration does not replace above-mentioned report.

measured by: WIND-consult GmbH
Reuterstraße 9
D-18211 Bargeschagen



- pdf - document was signed electronically -

Dipl.-Ing. A. Petersen

Dipl.-Ing. W. Wilke

date: 2006-01-24



DAP-PL-2756.00

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The accreditation is valid for test methods listed in the document.

Appendix E: Glossary of Terms

<i>A-Weighting Network</i>	A frequency weighting network intended to approximate the relative response of the healthy human ear to sounds of different frequencies. Overall sound levels calculated or measured using the A-weighting network are indicated by dBA rather than dB.
<i>Audible</i>	Can be heard with the healthy human ear. The audibility of a noise emission source can vary with ambient noise and distance from the source. When close to a noise source the characteristics of that source are easily distinguishable. If at a practical distance that noise source is masked by other louder sources or is simply quieter than the ambient noise levels then that source is considered to not be audible at the referenced location. This can at times be used as justification for neglecting the noise impact of a specific noise source.
<i>Frequency</i>	Typically the rate in Hertz (Hz) - previously denoted cycles per second, at which an event is repeated. <i>Normal human hearing extends over a range of frequencies from about 15 Hz to about 15 kHz.</i>
<i>L_{EQ} - "Equivalent sound level"</i>	The value of a constant sound pressure level which would result in the same total sound energy as would the measured time-varying sound pressure level if the constant sound pressure level persisted over an equal time duration.
<i>Noise Emissions</i>	The sound energy radiating away from a noise source.
<i>Noise Exposures</i>	The sound pressure generated at a receptor.
<i>Noise Impact</i>	The contribution of a specific sound emission source or group of sound emission sources to the resultant SPL or L _{EQ} as measured or predicted at a nearby noise sensitive receptor.
<i>Octave Band</i>	A band of frequencies where the upper limiting frequency (u.l.f.) is twice the lower limiting frequency (l.l.f.). <i>Octave bands are identified by their centre-frequencies. The octave bands standardized for acoustic measurements include those centered at 31.5, 63, 125, 250, 500, 1000, 2000, 4000, & 8000 Hz.</i>
<i>1/N Octave Band</i>	A band of frequencies integrally divided from an Octave Band. The u.l.f. equals $2^{1/N}$ times the l.l.f. <i>The most commonly used frequency band is the 1/3 octave band.</i>
<i>Point of Reception</i> <i>or</i> <i>Noise Sensitive Receptor</i>	Locations where excessive noise may disrupt the lives or activities of occupants/residents or in general where excessive noise would interfere with the intended use of the location under consideration.
<i>Sound Pressure</i>	The instantaneous difference between the actual pressure and the average barometric pressure at a given location.
<i>Sound Pressure Level (SPL)</i>	A measurement of instantaneous sound pressure and equal to 20 times the logarithm (base 10) of the ratio of the instantaneous sound pressure of a sound divided by the reference sound pressure of 20 µPa (0 dB). Reported and measured in decibels (dB or dBA).
<i>Sound Quality or Characteristic</i>	A descriptive qualifier which describes a sound's variation with either time or frequency. Specific qualifiers are described briefly below.

<i>Cyclic Variation</i>	A sound which has an audible cyclic variation in sound level such as beating or other amplitude modulation.
<i>Tonal</i>	A sound which has a pronounced audible tonal quality such as a whine, screech, buzz, or hum. A majority of the acoustic energy is present in a relatively narrow frequency band. A tonal penalty of 5 dB can be applied to any noise source where the manufacturer data or calculated sound power levels indicated a tonal quality to the sound as per ISO 1996-2:2006(E) – Annex D. This standard states that for a discrete tone to be identified, the time-averaged sound pressure level in the one-third octave band of interest is required to exceed the time-average sound pressure levels of both adjacent one-third octave bands by a defined level difference: • 15 dB in the low frequency bands (25 to 125 Hz) • 8 dB in the middle frequency bands (160 to 400 Hz) • 5 dB in the high frequency bands (500 to 10000 Hz) Although this standard assesses tonality based upon the 1/3 octave band spectrum, the 1/1 octave band spectrum can also be assessed on this basis. Typically sound power level predictions and manufacturer sound data only provide 1/1 octave band values. Typically tonal penalties for sources which were measured are only applied if a tone was observed as audible.
<i>Quasi-Steady Impulsive</i>	A sequence of impulsive sounds emitted from the same source, having a time interval of less than one half second (1/2-sec) between successive impulsive sounds.
<i>Steady</i>	A sound does not vary significantly with time and therefore the measured Sound Pressure Level does not vary significantly with time.
<i>Impulsive</i>	A single pressure pulse or a single burst of pressure pulses, as defined by IEC 179A, First supplement to IEC 1 79, Sections 3.1 and 3.2.

Appendix E: Glossary of Terms

<i>A-Weighting Network</i>	A frequency weighting network intended to approximate the relative response of the healthy human ear to sounds of different frequencies. Overall sound levels calculated or measured using the A-weighting network are indicated by dBA rather than dB.
<i>Acoustically Shielded</i>	A noise emission source from which the sound path to the noise sensitive receptor is blocked by a solid object of sufficient size and mass to consider the noise impact of that source negligible.
<i>Acoustics, Noise and Vibration (ANV)</i>	A unified field of study. Each sub-field is described in a specific context briefly below.
<i>Acoustics</i>	The study of problems where sound is desirable and the quality of the sound is the focus of attention. Examples include conference halls, theatres, classrooms and recording studios.
<i>Noise</i>	The study of problems where sound is undesirable and the reduction of sound is the focus of attention. Examples include noise emissions from industrial facilities and transportation corridors.
<i>Vibration</i>	The study of problems where excessive vibration is undesirable and the reduction of vibration amplitudes or vibration transmission is the focus of attention. Examples include vibration impact of equipment on building structures and the vibration impact of transportation corridors on the occupants of residential dwellings.
<i>Audible</i>	Can be heard with the healthy human ear. The audibility of a noise emission source can vary with ambient noise and distance from the source. When close to a noise source the characteristics of that source are easily distinguishable. If at a practical distance that noise source is masked by other louder sources or is simply quieter than the ambient noise levels then that source is considered to not be audible at the referenced location. This can at times be used as justification for neglecting the noise impact of a specific noise source.
<i>Frequency</i>	Typically the rate in Hertz (Hz) - previously denoted cycles per second, at which an event is repeated. <i>Normal human hearing extends over a range of frequencies from about 15 Hz to about 15 kHz.</i>
<i>Grade/Height References</i>	AG – Above Grade, AR – Above Roof, BG – Below Grade, Grade – Ground level
<i>L_{EQ} - “Equivalent sound level”</i>	The value of a constant sound pressure level which would result in the same total sound energy as would the measured time-varying sound pressure level if the constant sound pressure level persisted over an equal time duration.
<i>L_N - “Nth Exceedance level”</i> <i>where N = 0 to 100</i>	Is the Sound Pressure Level which is exceeded N percent of the time. For a given data sample the N th exceedance value is equal to the (100-N) th percentile of the data sample.
<i>Noise Emissions</i>	The sound energy radiating away from a noise source.
<i>Noise Exposures</i>	The sound pressure generated at a receptor.
<i>Noise Impact</i>	The contribution of a specific sound emission source or group of sound emission sources to the resultant SPL or L _{EQ} as measured or predicted at a nearby noise sensitive receptor.

<i>Non-Negligible Noise Source</i> <i>or equivalently</i> <i>Significant Noise Source</i>	A noise emission source which is determined to have a significant influence on the resultant noise exposures at a noise sensitive receptor. This is typically determined from a combination of site observations, measurements and available sound pressure or power data. Acoustical shielding effects or distance attenuation are often used as justification for excluding sources from this category.
<i>Octave Band</i>	A band of frequencies where the upper limiting frequency (u.l.f.) is twice the lower limiting frequency (l.l.f.). <i>Octave bands are identified by their centre-frequencies. The octave bands standardized for acoustic measurements include those centered at 31.5, 63, 125, 250, 500, 1000, 2000, 4000, & 8000 Hz.</i>
<i>1/N Octave Band</i>	A band of frequencies integrally divided from an Octave Band. The u.l.f. equals $2^{1/N}$ times the l.l.f. <i>The most commonly used frequency band is the 1/3 octave band.</i>
<i>Peak Particle Velocity (PPV)</i>	The maximum instantaneous velocity experienced by the particles of a medium when set into transient vibratory motion.
<i>Point of Reception</i> <i>or</i> <i>Noise Sensitive Receptor</i>	Locations where excessive noise may disrupt the lives or activities of occupants/residents or in general where excessive noise would interfere with the intended use of the location under consideration.
<i>Sound Pressure</i>	The instantaneous difference between the actual pressure and the average barometric pressure at a given location.
<i>Sound Pressure Level (SPL)</i>	A measurement of instantaneous sound pressure and equal to 20 times the logarithm (base 10) of the ratio of the instantaneous sound pressure of a sound divided by the reference sound pressure of 20 μ Pa (0 dB). Reported and measured in decibels (dB or dBA).
<i>Sound Quality or Characteristic</i>	A descriptive qualifier which describes a sound's variation with either time or frequency. Specific qualifiers are described briefly below.
<i>Cyclic Variation</i>	A sound which has an audible cyclic variation in sound level such as beating or other amplitude modulation.

<i>Tonal</i>	A sound which has a pronounced audible tonal quality such as a whine, screech, buzz, or hum. A majority of the acoustic energy is present in a relatively narrow frequency band. A tonal penalty of 5 dB can be applied to any noise source where the manufacturer data or calculated sound power levels indicated a tonal quality to the sound as per ISO 1996-2:2006(E) – Annex D. This standard states that for a discrete tone to be identified, the time-averaged sound pressure level in the one-third octave band of interest is required to exceed the time-average sound pressure levels of both adjacent one-third octave bands by a defined level difference: • 15 dB in the low frequency bands (25 to 125 Hz) • 8 dB in the middle frequency bands (160 to 400 Hz) • 5 dB in the high frequency bands (500 to 10000 Hz) Although this standard assesses tonality based upon the 1/3 octave band spectrum, the 1/1 octave band spectrum can also be assessed on this basis. Typically sound power level predictions and manufacturer sound data only provide 1/1 octave band values. Typically tonal penalties for sources which were measured are only applied if a tone was observed as audible.
<i>Quasi-Steady Impulsive</i>	A sequence of impulsive sounds emitted from the same source, having a time interval of less than one half second (1/2-sec) between successive impulsive sounds.
<i>Steady</i>	A sound does not vary significantly with time and therefore the measured Sound Pressure Level does not vary significantly with time.
<i>Impulsive</i>	A single pressure pulse or a single burst of pressure pulses, as defined by IEC 179A, First supplement to IEC 1 79, Sections 3.1 and 3.2.
<i>Transmission Loss (TL)</i>	The measure of the airborne sound reduction provided by a partition. <i>Expressed in decibels (dB) it is a measure of ratio of the acoustic energy striking the partition relative to the energy which is transmitted through it.</i>
<i>Root Mean Square (RMS) Vibration Velocity</i>	Vibration velocity value obtained when the instantaneous velocity is exponentially averaged in a RMS network with a time constant of one second.
<i>Vibration Sensitive Receptor</i>	Locations where excessive vibration may disrupt the lives or activities of occupants/residents or in general where excessive vibration would interfere with the intended use of the location under consideration.

Appendix B

Site Plan

Table 1. UTM Coordinates of Proposed Goshen Wind Energy Centre Turbines

Turbine Number	Easting	Northing
2	450520	4805782
3	451051	4805361
4	450524	4804972
5	451300	4804616
6	451203	4803770
7	446869	4804385
8	447071	4803417
9	446830	4802090
10	448722	4804602
11	448568	4803670
12	449241	4803328
13	448911	4802237
14	448875	4801624
15	449226	4800450
16	444383	4793947
17	443972	4792675
19	445549	4795811
20	445679	4795219
21	445847	4794126
22	447530	4795721
23	447843	4796331
31	452335	4797930
32	452553	4796971
33	452366	4796399
34	453108	4799573
35	454089	4796605
36	446196	4792203
37	446287	4791638
38	446167	4791042
39	447984	4793710
41	448895	4791606
42	448990	4790737
46	452699	4790500
47	452425	4792588
48	452825	4793244
49	454586	4792838
50	455040	4793271
52	440156	4788373
53	442135	4790871
54	439792	4790436
55	440005	4789811
56	439925	4788922
57	438121	4790232
58	437973	4789428
59	438098	4788616
60	437501	4789050
61	437294	4788459
62	437743	4788017
63	438227	4787615
64	446988	4791822
65	454014	4798992
66	446376	4794650
67	453955	4799707
68	450577	4790696
69	450788	4791504
70	450838	4792170
71	451847	4795547
72	450670	4804345

Turbine Number	Easting	Northing
73	453192	4800669
74	453886	4795484
75	454731	4795014
76	454137	4793736
77	453186	4791237
78	447027	4790721
79	441914	4791634
80	445510	4796315
81	450167	4794140
82	452242	4793145
83	441815	4792131
84	438410	4790647
85	446173	4795111
86	446578	4793447

Note: All co-ordinates are provided in NAD 83 Zone 17.

Table 2. UTM Coordinates of Existing Turbine in the Municipality of Bluewater

Turbine Name	Easting	Northing
Zurich Wind Farm	446741	4808399

Note: All co-ordinates are provided in NAD 83 Zone 17.

Table 3. UTM Coordinates of Receptors within Two Kilometres of Project Location

Receptor ID Number	Receptor Type	Easting	Northing
GSH1000	Non-Participating	4789591	443611
GSH1001	Non-Participating	4789604	443655
GSH1002	Non-Participating	4789780	443808
GSH1003	Non-Participating	4789828	443806
GSH1004	Non-Participating	4789815	443765
GSH1005	Non-Participating	4789873	443625
GSH1006	Non-Participating	4789901	443593
GSH1007	Non-Participating	4789883	443578
GSH1008	Non-Participating	4790095	443690
GSH1009	Non-Participating	4790126	443678
GSH1010	Non-Participating	4790175	443583
GSH1011	Non-Participating	4790177	443570
GSH1012	Non-Participating	4790146	443566
GSH1013	Non-Participating	4790311	443507
GSH1014	Non-Participating	4790297	443543
GSH1015	Non-Participating	4790322	443546
GSH1016	Non-Participating	4790344	443562
GSH1017	Non-Participating	4790531	443458
GSH1018	Non-Participating	4790561	443460
GSH1019	Non-Participating	4790618	443622
GSH1020	Non-Participating	4790648	443618
GSH1021	Non-Participating	4790630	443685
GSH1022	Non-Participating	4790691	443626
GSH1023	Non-Participating	4790733	443644
GSH1024	Non-Participating	4791787	443423
GSH1025	Non-Participating	4791737	443429
GSH1026	Non-Participating	4791729	443447
GSH1027	Non-Participating	4791780	443447
GSH1028	Non-Participating	4791796	442477
GSH1029	Non-Participating	4793567	443303
GSH1087	Participating	4793098	448088
GSH1088	Participating	4793059	448067
GSH1089	Participating	4793007	448078
GSH1090	Participating	4792964	448084
GSH1091	Non-Participating	4793089	448264
GSH1092	Non-Participating	4793131	448333
GSH1093	Non-Participating	4793130	448397
GSH1094	Non-Participating	4793127	448377
GSH1095	Non-Participating	4793090	448368
GSH1096	Non-Participating	4793089	448385
GSH1097	Non-Participating	4793076	448397
GSH1098	Non-Participating	4797345	448082
GSH1099	Non-Participating	4797318	448106
GSH1100	Non-Participating	4797329	448145
GSH1106	Non-Participating	4801750	445928
GSH1107	Non-Participating	4801785	445981
GSH1108	Non-Participating	4801767	445980
GSH1109	Non-Participating	4801793	446025
GSH1110	Non-Participating	4801759	446055
GSH1111	Non-Participating	4801788	446149
GSH1112	Non-Participating	4801767	446168
GSH1113	Non-Participating	4801793	446207
GSH1114	Non-Participating	4802971	445825
GSH1115	Non-Participating	4802981	445863
GSH1116	Non-Participating	4802942	446097
GSH1117	Non-Participating	4802982	446112
GSH1118	Non-Participating	4802976	446156
GSH1119	Non-Participating	4802957	446188
GSH1175	Non-Participating	4806060	447471
GSH1176	Non-Participating	4806100	447502

Receptor ID Number	Receptor Type	Easting	Northing
GSH1177	Non-Participating	4806107	447524
GSH1178	Non-Participating	4806067	447523
GSH1179	Non-Participating	4806137	447791
GSH118	Non-Participating	4791820	436991
GSH1180	Non-Participating	4806078	447817
GSH1181	Non-Participating	4806115	447841
GSH1182	Non-Participating	4805685	447538
GSH1183	Non-Participating	4805657	447570
GSH1184	Non-Participating	4805658	447595
GSH1185	Non-Participating	4805699	447574
GSH1186	Non-Participating	4805710	447863
GSH1187	Non-Participating	4805649	447853
GSH1188	Non-Participating	4805660	447906
GSH1189	Non-Participating	4804827	447561
GSH119	Non-Participating	4791795	437009
GSH1190	Non-Participating	4804867	447593
GSH1191	Non-Participating	4804827	447590
GSH1192	Non-Participating	4804828	447601
GSH1193	Non-Participating	4804821	447636
GSH1194	Non-Participating	4804831	447651
GSH1195	Non-Participating	4804804	447674
GSH1196	Non-Participating	4804870	447631
GSH1197	Non-Participating	4804908	447639
GSH1198	Non-Participating	4804842	447657
GSH1199	Participating	4804485	447751
GSH120	Non-Participating	4791797	437031
GSH1200	Participating	4804428	447755
GSH1201	Participating	4804561	448122
GSH1202	Participating	4804620	448105
GSH1203	Participating	4804607	448134
GSH1204	Participating	4804575	448140
GSH1205	Non-Participating	4804293	447800
GSH1206	Non-Participating	4804186	447788
GSH1207	Non-Participating	4804188	447823
GSH1208	Non-Participating	4804135	447826
GSH1209	Non-Participating	4804104	448077
GSH1210	Non-Participating	4804105	448007
GSH1211	Non-Participating	4804128	447991
GSH1212	Participating	4803552	447994
GSH1213	Participating	4803610	447985
GSH1214	Participating	4803594	448001
GSH1215	Non-Participating	4803622	447911
GSH1216	Non-Participating	4803603	447877
GSH1217	Non-Participating	4803830	447888
GSH1218	Non-Participating	4803865	447891
GSH1219	Participating	4803319	448224
GSH1220	Participating	4803315	448162
GSH1221	Non-Participating	4802795	447949
GSH1222	Non-Participating	4802771	447941
GSH1223	Non-Participating	4802763	447984
GSH1224	Non-Participating	4802884	448327
GSH1225	Non-Participating	4802907	448377
GSH1226	Non-Participating	4802481	448235
GSH1227	Non-Participating	4802484	448206
GSH1228	Participating	4802116	448252
GSH1229	Participating	4802101	448291
GSH1230	Participating	4802066	448252
GSH1231	Non-Participating	4801884	448207
GSH1232	Non-Participating	4801870	448226
GSH1233	Participating	4801778	448440
GSH1234	Participating	4801751	448443
GSH1235	Participating	4801752	448417

Receptor ID Number	Receptor Type	Easting	Northing
GSH1236	Participating	4801681	448440
GSH1237	Participating	4801663	448421
GSH1238	Participating	4801637	448419
GSH1239	Non-Participating	4801561	448154
GSH1240	Non-Participating	4801558	448138
GSH1241	Non-Participating	4801513	448131
GSH1242	Non-Participating	4801514	448142
GSH1243	Non-Participating	4801509	448153
GSH1244	Non-Participating	4801506	448164
GSH1245	Non-Participating	4801530	448174
GSH1246	Non-Participating	4801519	448188
GSH1247	Non-Participating	4801555	448188
GSH1248	Non-Participating	4801557	448172
GSH1249	Non-Participating	4801565	448184
GSH1250	Participating	4801492	448283
GSH1251	Non-Participating	4801383	448338
GSH1252	Non-Participating	4801358	448367
GSH1253	Non-Participating	4801321	448378
GSH1254	Non-Participating	4800584	448148
GSH1255	Non-Participating	4800513	448070
GSH1256	Non-Participating	4800434	448185
GSH1257	Non-Participating	4800415	448165
GSH1258	Non-Participating	4800389	448324
GSH1259	Non-Participating	4800382	448356
GSH1260	Non-Participating	4800491	448511
GSH1261	Non-Participating	4800563	448491
GSH1262	Non-Participating	4800833	448425
GSH1263	Non-Participating	4800813	448457
GSH1264	Non-Participating	4800769	448421
GSH1265	Non-Participating	4799274	447708
GSH1266	Non-Participating	4799238	447708
GSH1267	Non-Participating	4799213	447755
GSH1268	Non-Participating	4799163	447763
GSH1269	Non-Participating	4799222	447789
GSH1270	Non-Participating	4799267	447782
GSH1271	Non-Participating	4799267	447833
GSH1272	Non-Participating	4799283	447893
GSH1273	Non-Participating	4799240	447899
GSH1274	Non-Participating	4799209	447842
GSH1275	Non-Participating	4799271	447935
GSH1276	Non-Participating	4799182	447909
GSH1277	Non-Participating	4799027	447881
GSH1278	Non-Participating	4798984	447888
GSH1286	Non-Participating	4799376	447824
GSH1287	Non-Participating	4799311	447977
GSH1288	Non-Participating	4799664	449573
GSH1289	Non-Participating	4799683	449768
GSH1290	Non-Participating	4799695	449766
GSH1291	Non-Participating	4799708	449756
GSH1292	Non-Participating	4799718	449740
GSH1293	Non-Participating	4799701	449714
GSH1294	Non-Participating	4799744	449689
GSH1295	Non-Participating	4799371	449938
GSH1296	Non-Participating	4799446	449928
GSH1297	Non-Participating	4799463	449917
GSH1298	Non-Participating	4799440	449867
GSH1299	Non-Participating	4798584	448536
GSH1300	Non-Participating	4798579	448601
GSH1301	Non-Participating	4798634	448689
GSH1302	Non-Participating	4799674	449245
GSH1303	Non-Participating	4799633	449247
GSH1304	Non-Participating	4799657	449281

Receptor ID Number	Receptor Type	Easting	Northing
GSH1305	Non-Participating	4799573	449264
GSH1306	Non-Participating	4799411	449264
GSH1307	Non-Participating	4799384	449281
GSH1308	Non-Participating	4799389	449310
GSH1309	Non-Participating	4799442	449298
GSH1310	Non-Participating	4799500	449393
GSH1314	Non-Participating	4798028	448765
GSH1315	Non-Participating	4798031	448781
GSH1316	Non-Participating	4798016	448808
GSH1317	Non-Participating	4798044	448819
GSH1318	Non-Participating	4797540	448993
GSH1319	Non-Participating	4797549	449008
GSH1320	Non-Participating	4797609	449011
GSH1321	Non-Participating	4797553	449030
GSH1322	Non-Participating	4797576	449054
GSH1323	Non-Participating	4797546	449061
GSH1324	Non-Participating	4797535	449065
GSH1325	Non-Participating	4797555	449046
GSH1326	Non-Participating	4797559	449076
GSH1327	Non-Participating	4797205	448962
GSH1328	Non-Participating	4797281	448977
GSH1330	Non-Participating	4796719	448829
GSH1331	Non-Participating	4796745	448858
GSH1332	Non-Participating	4796880	449059
GSH1333	Non-Participating	4796848	449091
GSH1334	Non-Participating	4796816	449086
GSH1335	Non-Participating	4796816	449122
GSH1336	Non-Participating	4796815	449135
GSH1337	Non-Participating	4796875	449240
GSH1338	Non-Participating	4796508	448841
GSH1339	Non-Participating	4796453	448865
GSH1340	Non-Participating	4796436	448838
GSH1341	Non-Participating	4796399	449025
GSH1342	Non-Participating	4796381	449075
GSH1343	Non-Participating	4796418	449094
GSH1344	Non-Participating	4795994	448913
GSH1345	Non-Participating	4796032	448934
GSH1346	Non-Participating	4795875	448959
GSH1347	Non-Participating	4795861	448932
GSH1348	Non-Participating	4795856	448916
GSH1349	Non-Participating	4795794	448875
GSH1350	Non-Participating	4795779	448914
GSH1351	Non-Participating	4794762	449319
GSH1352	Non-Participating	4794761	449380
GSH1353	Non-Participating	4794319	449166
GSH1354	Non-Participating	4794305	449196
GSH1355	Non-Participating	4794316	449450
GSH1356	Non-Participating	4793939	449244
GSH1357	Non-Participating	4793914	449223
GSH1358	Non-Participating	4793897	449225
GSH1359	Participating	4793859	449445
GSH1360	Participating	4793863	449459
GSH1361	Participating	4793906	449489
GSH1362	Participating	4793909	449503
GSH1363	Participating	4793909	449533
GSH1364	Participating	4793369	448815
GSH1365	Participating	4793293	448825
GSH1366	Non-Participating	4793550	449513
GSH1367	Non-Participating	4793520	449485
GSH1368	Non-Participating	4793493	449496
GSH1369	Non-Participating	4793473	449479
GSH1370	Non-Participating	4793526	449433

Receptor ID Number	Receptor Type	Easting	Northing
GSH1371	Non-Participating	4793226	449520
GSH1372	Non-Participating	4793246	449593
GSH1373	Non-Participating	4793198	449573
GSH1374	Non-Participating	4793049	449423
GSH1375	Non-Participating	4793023	449419
GSH1376	Non-Participating	4793490	450461
GSH1377	Non-Participating	4793501	450502
GSH1378	Non-Participating	4792716	449228
GSH1379	Non-Participating	4792691	449285
GSH1380	Non-Participating	4792729	449303
GSH1381	Non-Participating	4792329	449632
GSH1382	Non-Participating	4792345	449660
GSH1383	Non-Participating	4792298	449646
GSH1384	Non-Participating	4792281	449680
GSH1385	Non-Participating	4792097	449520
GSH1386	Non-Participating	4792120	449536
GSH1387	Participating	4791839	449335
GSH1388	Participating	4791819	449356
GSH1389	Participating	4791861	449404
GSH1390	Non-Participating	4791959	449759
GSH1391	Non-Participating	4791974	449773
GSH1392	Participating	4791556	449606
GSH1393	Participating	4791562	449623
GSH1394	Participating	4791574	449644
GSH1395	Participating	4791513	449624
GSH1396	Participating	4791557	449733
GSH1397	Participating	4791592	449766
GSH1398	Participating	4791624	449718
GSH1399	Participating	4791555	449805
GSH1400	Non-Participating	4791323	449776
GSH1401	Participating	4791093	449867
GSH1402	Participating	4791109	449917
GSH1403	Participating	4790672	449727
GSH1404	Participating	4790623	449727
GSH1405	Participating	4790609	449739
GSH1406	Non-Participating	4790609	449899
GSH1407	Non-Participating	4790604	449915
GSH1408	Participating	4790662	449910
GSH1409	Participating	4790662	449895
GSH1410	Participating	4790670	449873
GSH1411	Participating	4790687	449942
GSH1412	Participating	4790684	449975
GSH1413	Non-Participating	4790633	449947
GSH1414	Non-Participating	4790274	449694
GSH1415	Non-Participating	4790275	449722
GSH1416	Non-Participating	4790256	449764
GSH1417	Non-Participating	4790289	450065
GSH1418	Non-Participating	4790292	450000
GSH1419	Non-Participating	4790099	449979
GSH1420	Non-Participating	4789198	449292
GSH1421	Non-Participating	4789153	449317
GSH1422	Non-Participating	4789170	449348
GSH1423	Non-Participating	4789064	449299
GSH1424	Non-Participating	4789465	450681
GSH1425	Non-Participating	4789411	450669
GSH1426	Non-Participating	4789450	450710
GSH1427	Non-Participating	4789376	450683
GSH1428	Non-Participating	4789245	450862
GSH1429	Non-Participating	4789197	450855
GSH1430	Non-Participating	4789560	451320
GSH1431	Non-Participating	4789538	451297
GSH1432	Non-Participating	4789527	451318

Receptor ID Number	Receptor Type	Easting	Northing
GSH1433	Non-Participating	4789531	451353
GSH1434	Non-Participating	4789474	451325
GSH1435	Non-Participating	4789362	451343
GSH1436	Non-Participating	4789296	451338
GSH1437	Non-Participating	4789318	451357
GSH1438	Non-Participating	4789292	451371
GSH1439	Non-Participating	4789313	451387
GSH1440	Non-Participating	4789493	451545
GSH1441	Non-Participating	4789543	451565
GSH1442	Non-Participating	4789540	451532
GSH1443	Non-Participating	4789577	451521
GSH1444	Non-Participating	4789570	451555
GSH1461	Non-Participating	4789465	452178
GSH1462	Non-Participating	4789605	452339
GSH1463	Non-Participating	4789653	452344
GSH1464	Non-Participating	4789652	452386
GSH1465	Non-Participating	4789627	452556
GSH1466	Non-Participating	4789647	452700
GSH1467	Non-Participating	4789688	452689
GSH1468	Non-Participating	4789731	452664
GSH1469	Non-Participating	4789751	452695
GSH1470	Non-Participating	4789726	452719
GSH1471	Non-Participating	4789565	452824
GSH1472	Non-Participating	4789522	452815
GSH1473	Non-Participating	4789492	452796
GSH1474	Non-Participating	4789505	452867
GSH1475	Non-Participating	4789945	453305
GSH1476	Non-Participating	4789861	453291
GSH1477	Non-Participating	4789855	453231
GSH1478	Non-Participating	4789800	453306
GSH1479	Non-Participating	4789759	453316
GSH1480	Participating	4792181	451458
GSH1481	Participating	4792180	451480
GSH1482	Participating	4792195	451536
GSH1483	Participating	4792148	451591
GSH1484	Participating	4792153	451548
GSH1485	Non-Participating	4792376	451270
GSH1486	Non-Participating	4792451	451265
GSH1487	Non-Participating	4792556	451278
GSH1488	Non-Participating	4792553	451354
GSH1489	Non-Participating	4792571	451390
GSH1490	Non-Participating	4792980	451508
GSH1491	Non-Participating	4793025	451490
GSH1492	Non-Participating	4793057	451488
GSH1493	Non-Participating	4793090	451480
GSH1494	Non-Participating	4793154	451473
GSH1495	Participating	4793022	451617
GSH1496	Non-Participating	4793432	451347
GSH1497	Non-Participating	4793406	451390
GSH1498	Non-Participating	4793444	451387
GSH1499	Non-Participating	4793504	451362
GSH1500	Non-Participating	4793534	451396
GSH1501	Non-Participating	4793529	451608
GSH1502	Non-Participating	4793551	451646
GSH1503	Non-Participating	4793510	451668
GSH1504	Non-Participating	4793578	451614
GSH1505	Non-Participating	4793832	451493
GSH1506	Non-Participating	4793696	451405
GSH1507	Non-Participating	4793697	451673
GSH1508	Non-Participating	4793677	451407
GSH1509	Non-Participating	4794206	451255
GSH1510	Non-Participating	4794177	451248

Receptor ID Number	Receptor Type	Easting	Northing
GSH1511	Non-Participating	4794212	451313
GSH1512	Non-Participating	4794318	451440
GSH1513	Non-Participating	4794545	451110
GSH1514	Non-Participating	4794533	451128
GSH1515	Non-Participating	4794636	451423
GSH1516	Non-Participating	4794619	451488
GSH1517	Non-Participating	4794653	451513
GSH1518	Non-Participating	4794971	451063
GSH1519	Non-Participating	4794971	451133
GSH1520	Non-Participating	4795002	451139
GSH1521	Non-Participating	4795140	451281
GSH1522	Non-Participating	4795309	451117
GSH1523	Non-Participating	4795331	451143
GSH1524	Participating	4795453	451250
GSH1525	Participating	4795488	451223
GSH1526	Participating	4795495	451247
GSH1527	Participating	4795490	451272
GSH1528	Participating	4795473	451292
GSH1529	Non-Participating	4795707	451073
GSH1530	Non-Participating	4795721	451124
GSH1531	Non-Participating	4796241	450954
GSH1532	Non-Participating	4796251	451001
GSH1533	Non-Participating	4796211	450989
GSH1534	Non-Participating	4796186	450991
GSH1535	Non-Participating	4796239	451187
GSH1536	Non-Participating	4796263	451209
GSH1537	Non-Participating	4796272	451253
GSH1538	Non-Participating	4796674	450926
GSH1539	Non-Participating	4796645	450942
GSH1540	Non-Participating	4797603	450770
GSH1541	Non-Participating	4797604	450792
GSH1542	Non-Participating	4797565	450824
GSH1543	Non-Participating	4797512	450784
GSH1544	Participating	4797733	451132
GSH1545	Participating	4797770	451140
GSH1546	Participating	4797754	451183
GSH1547	Non-Participating	4798233	450670
GSH1548	Non-Participating	4798219	450696
GSH1549	Non-Participating	4798262	450716
GSH1550	Non-Participating	4798244	450736
GSH1551	Non-Participating	4798279	450884
GSH1552	Non-Participating	4798284	450909
GSH1553	Non-Participating	4798246	450935
GSH1554	Non-Participating	4798271	450972
GSH1555	Non-Participating	4798442	450807
GSH1556	Non-Participating	4798464	450788
GSH1557	Non-Participating	4798723	450799
GSH1558	Non-Participating	4798700	450782
GSH1559	Non-Participating	4798689	450804
GSH1560	Non-Participating	4798920	451171
GSH1561	Non-Participating	4799607	450288
GSH1562	Non-Participating	4799714	450472
GSH1563	Non-Participating	4799604	450531
GSH1564	Non-Participating	4799583	450520
GSH1565	Non-Participating	4799745	450501
GSH1566	Non-Participating	4799948	450651
GSH1567	Non-Participating	4799922	450665
GSH1568	Non-Participating	4799892	450653
GSH1569	Non-Participating	4799522	450826
GSH1570	Non-Participating	4799496	450855
GSH1571	Non-Participating	4799474	450801
GSH1572	Non-Participating	4800722	450253

Receptor ID Number	Receptor Type	Easting	Northing
GSH1573	Non-Participating	4800782	450466
GSH1574	Non-Participating	4800822	450471
GSH1575	Non-Participating	4801109	450121
GSH1576	Non-Participating	4801125	450147
GSH1577	Non-Participating	4801162	450167
GSH1578	Non-Participating	4801119	450196
GSH1579	Non-Participating	4801132	450205
GSH1580	Non-Participating	4801172	450233
GSH1581	Non-Participating	4801079	450182
GSH1582	Non-Participating	4801078	450168
GSH1583	Non-Participating	4801637	449944
GSH1584	Non-Participating	4801592	450063
GSH1585	Non-Participating	4801625	450058
GSH1586	Non-Participating	4801635	450077
GSH1587	Non-Participating	4802321	450158
GSH1588	Non-Participating	4802369	450148
GSH1589	Non-Participating	4802340	450073
GSH1590	Non-Participating	4801516	450399
GSH1591	Non-Participating	4801516	450463
GSH1592	Non-Participating	4801525	450501
GSH1593	Non-Participating	4802746	449945
GSH1594	Non-Participating	4802721	450011
GSH1595	Non-Participating	4802774	450215
GSH1596	Non-Participating	4802750	450260
GSH1597	Non-Participating	4802797	450257
GSH1598	Non-Participating	4803090	449937
GSH1599	Non-Participating	4803517	450121
GSH1600	Non-Participating	4803981	449818
GSH1601	Non-Participating	4803971	449844
GSH1602	Non-Participating	4803978	449854
GSH1603	Non-Participating	4804003	449884
GSH1604	Non-Participating	4803942	449874
GSH1605	Participating	4803990	450244
GSH1606	Participating	4803972	450209
GSH1607	Participating	4803953	450214
GSH1608	Non-Participating	4804277	449658
GSH1609	Non-Participating	4804292	449674
GSH1610	Non-Participating	4804279	449690
GSH1611	Non-Participating	4804304	449731
GSH1612	Non-Participating	4804366	449851
GSH1613	Non-Participating	4804362	449874
GSH1614	Non-Participating	4804762	449710
GSH1615	Non-Participating	4804750	449808
GSH1616	Participating	4804699	449922
GSH1617	Participating	4804757	449931
GSH1618	Participating	4804807	449940
GSH1619	Non-Participating	4805168	449763
GSH1620	Non-Participating	4805228	449737
GSH1621	Non-Participating	4805331	449729
GSH1622	Non-Participating	4805732	449655
GSH1623	Non-Participating	4805712	449629
GSH1624	Non-Participating	4805693	449639
GSH1625	Non-Participating	4805687	449678
GSH1626	Non-Participating	4805693	449665
GSH1627	Participating	4805604	449897
GSH1628	Participating	4805584	449888
GSH1629	Participating	4805565	449911
GSH1630	Non-Participating	4805946	449489
GSH1631	Non-Participating	4805994	449559
GSH1632	Non-Participating	4805990	449537
GSH1633	Non-Participating	4806022	449749
GSH1634	Non-Participating	4806026	449731

Receptor ID Number	Receptor Type	Easting	Northing
GSH1635	Non-Participating	4806028	449714
GSH1636	Non-Participating	4806007	449760
GSH1637	Non-Participating	4806398	449676
GSH1638	Non-Participating	4806454	449687
GSH1639	Non-Participating	4806419	449719
GSH1640	Non-Participating	4806363	449706
GSH1641	Non-Participating	4806369	449728
GSH1642	Non-Participating	4806413	449891
GSH1643	Non-Participating	4806699	449511
GSH1644	Non-Participating	4806740	449497
GSH1645	Non-Participating	4806779	449713
GSH1646	Non-Participating	4806951	449499
GSH1647	Non-Participating	4806956	449577
GSH1648	Non-Participating	4807038	449480
GSH1649	Non-Participating	4807057	449461
GSH1650	Non-Participating	4807079	449472
GSH1651	Non-Participating	4807118	449390
GSH1652	Non-Participating	4807103	449623
GSH1653	Non-Participating	4807060	449648
GSH1654	Non-Participating	4807119	449641
GSH1721	Non-Participating	4807366	451243
GSH1722	Non-Participating	4807339	451215
GSH1723	Non-Participating	4807323	451261
GSH1724	Non-Participating	4807219	451638
GSH1725	Non-Participating	4807026	451646
GSH1726	Non-Participating	4807028	451610
GSH1727	Non-Participating	4806972	451625
GSH1728	Non-Participating	4806938	451440
GSH1729	Non-Participating	4806957	451380
GSH1730	Non-Participating	4806936	451348
GSH1731	Non-Participating	4806968	451349
GSH1732	Non-Participating	4806634	451463
GSH1733	Non-Participating	4806598	451495
GSH1734	Non-Participating	4806428	451719
GSH1735	Non-Participating	4806382	451726
GSH1736	Non-Participating	4806160	451525
GSH1737	Non-Participating	4806151	451487
GSH1738	Non-Participating	4806125	451501
GSH1739	Non-Participating	4806093	451505
GSH1740	Non-Participating	4806112	451536
GSH1741	Non-Participating	4806185	451513
GSH1742	Participating	4805937	451265
GSH1743	Participating	4805829	451257
GSH1744	Participating	4805778	451224
GSH1745	Participating	4805704	451240
GSH1746	Participating	4805489	451427
GSH1747	Participating	4805530	451449
GSH1748	Participating	4805493	451478
GSH1749	Participating	4805462	451473
GSH1750	Non-Participating	4805298	451664
GSH1751	Non-Participating	4805313	451686
GSH1752	Participating	4804847	451756
GSH1753	Participating	4804820	451761
GSH1754	Participating	4804847	451778
GSH1755	Non-Participating	4804437	451933
GSH1756	Participating	4804268	451919
GSH1757	Participating	4804246	451894
GSH1758	Participating	4804213	451913
GSH1759	Non-Participating	4803780	451987
GSH1760	Non-Participating	4803776	452000
GSH1761	Non-Participating	4803792	452107
GSH1762	Non-Participating	4803804	452152

Receptor ID Number	Receptor Type	Easting	Northing
GSH1763	Non-Participating	4803836	452137
GSH1764	Non-Participating	4803455	452018
GSH1765	Non-Participating	4803470	452057
GSH1766	Non-Participating	4803127	452079
GSH1767	Non-Participating	4803089	452062
GSH1768	Non-Participating	4803070	452067
GSH1769	Non-Participating	4803053	452086
GSH1770	Non-Participating	4803040	452074
GSH1771	Non-Participating	4802690	451969
GSH1772	Non-Participating	4802725	451995
GSH1773	Non-Participating	4802752	451990
GSH1774	Non-Participating	4802505	452063
GSH1775	Non-Participating	4802516	452089
GSH1776	Non-Participating	4802506	452128
GSH1777	Non-Participating	4802512	452313
GSH1778	Non-Participating	4802018	452272
GSH1779	Non-Participating	4802059	452283
GSH1780	Non-Participating	4801761	452230
GSH1781	Non-Participating	4801773	452238
GSH1782	Non-Participating	4801738	452262
GSH1783	Non-Participating	4801730	452328
GSH1784	Non-Participating	4801713	452310
GSH1785	Non-Participating	4801509	452466
GSH1786	Non-Participating	4801322	452232
GSH1787	Non-Participating	4801338	452202
GSH1788	Non-Participating	4801342	452185
GSH1789	Non-Participating	4801333	452152
GSH1790	Non-Participating	4801328	452132
GSH1791	Non-Participating	4800956	452261
GSH1792	Non-Participating	4800984	452325
GSH1793	Non-Participating	4800940	452337
GSH1794	Non-Participating	4800455	452627
GSH1795	Non-Participating	4800407	452605
GSH1796	Non-Participating	4800418	452631
GSH1797	Non-Participating	4799947	451481
GSH1798	Non-Participating	4799913	451512
GSH1799	Non-Participating	4799883	451515
GSH1800	Non-Participating	4799880	451496
GSH1801	Non-Participating	4799987	451918
GSH1802	Non-Participating	4799945	451890
GSH1803	Non-Participating	4799802	451915
GSH1804	Non-Participating	4799786	451927
GSH1805	Non-Participating	4799708	451900
GSH1806	Non-Participating	4800017	452341
GSH1807	Non-Participating	4799975	452364
GSH1808	Non-Participating	4799790	452449
GSH1809	Non-Participating	4799757	452465
GSH1810	Participating	4799872	452797
GSH1811	Participating	4799824	452817
GSH1812	Participating	4800195	453441
GSH1813	Participating	4800193	453482
GSH1814	Participating	4800173	453480
GSH1815	Participating	4800151	453489
GSH1816	Participating	4800152	453502
GSH1817	Participating	4800134	453507
GSH1818	Participating	4800150	453469
GSH1819	Participating	4800123	453453
GSH1820	Participating	4800129	453422
GSH1821	Participating	4800166	453423
GSH1822	Participating	4800004	453397
GSH1823	Participating	4799962	453402
GSH1824	Participating	4799977	453475

Receptor ID Number	Receptor Type	Easting	Northing
GSH1825	Participating	4800005	453507
GSH1826	Non-Participating	4798758	452634
GSH1827	Non-Participating	4798782	452652
GSH1828	Non-Participating	4798762	452704
GSH1829	Non-Participating	4798819	452715
GSH1830	Non-Participating	4798768	452751
GSH1831	Non-Participating	4798934	452900
GSH1832	Non-Participating	4798943	452966
GSH1833	Non-Participating	4798324	452780
GSH1834	Non-Participating	4798256	452743
GSH1835	Non-Participating	4798283	452790
GSH1836	Non-Participating	4798294	452799
GSH1837	Non-Participating	4798234	452804
GSH1838	Non-Participating	4798251	452789
GSH1839	Non-Participating	4798162	453407
GSH1840	Non-Participating	4798195	453409
GSH1841	Non-Participating	4798185	453473
GSH1842	Non-Participating	4797977	453619
GSH1843	Non-Participating	4797983	453664
GSH1844	Participating	4797956	452786
GSH1845	Non-Participating	4797983	452978
GSH1846	Non-Participating	4798007	452971
GSH1847	Participating	4797280	452826
GSH1848	Participating	4797283	452856
GSH1849	Non-Participating	4797320	453086
GSH1850	Non-Participating	4797363	453089
GSH1851	Non-Participating	4797378	453105
GSH1852	Non-Participating	4797340	453147
GSH1853	Non-Participating	4797323	453139
GSH1854	Non-Participating	4797291	453118
GSH1855	Non-Participating	4797290	453173
GSH1856	Non-Participating	4796987	453171
GSH1857	Non-Participating	4796957	453218
GSH1858	Non-Participating	4797005	453257
GSH1859	Non-Participating	4796520	453365
GSH1860	Non-Participating	4796519	453431
GSH1861	Non-Participating	4796119	453092
GSH1862	Non-Participating	4796057	453080
GSH1863	Non-Participating	4796051	452978
GSH1864	Non-Participating	4796109	453147
GSH1865	Non-Participating	4795965	453366
GSH1866	Non-Participating	4796010	453392
GSH1867	Non-Participating	4796026	453416
GSH1868	Non-Participating	4795994	453418
GSH1869	Non-Participating	4795498	453254
GSH1870	Non-Participating	4795455	453260
GSH1871	Non-Participating	4795396	453272
GSH1872	Non-Participating	4795415	453246
GSH1873	Participating	4795228	453410
GSH1874	Participating	4795213	453457
GSH1875	Participating	4795191	453443
GSH1876	Participating	4795194	453384
GSH1877	Non-Participating	4794842	453277
GSH1878	Non-Participating	4794861	453305
GSH1879	Non-Participating	4794838	453350
GSH1880	Non-Participating	4794903	453432
GSH1881	Non-Participating	4794935	453471
GSH1882	Non-Participating	4794957	453517
GSH1883	Non-Participating	4794949	453421
GSH1884	Non-Participating	4794481	453528
GSH1885	Non-Participating	4794484	453552
GSH1886	Non-Participating	4794485	453604

Receptor ID Number	Receptor Type	Easting	Northing
GSH1887	Non-Participating	4794361	453623
GSH1888	Non-Participating	4794375	453555
GSH1889	Non-Participating	4794332	453560
GSH1890	Non-Participating	4794302	453581
GSH1891	Non-Participating	4794358	453494
GSH1892	Non-Participating	4793728	453476
GSH1893	Non-Participating	4793687	453481
GSH1894	Non-Participating	4793677	453516
GSH1895	Non-Participating	4793740	453511
GSH1896	Participating	4793798	453744
GSH1897	Participating	4793801	453712
GSH1898	Participating	4793848	453707
GSH1899	Non-Participating	4793499	453652
GSH1900	Non-Participating	4793474	453620
GSH1901	Non-Participating	4793459	453667
GSH1902	Participating	4793249	453485
GSH1903	Participating	4793256	453534
GSH1904	Participating	4793256	453574
GSH1905	Participating	4793195	453498
GSH1906	Participating	4793201	453515
GSH1907	Participating	4793195	453556
GSH1908	Participating	4793134	453525
GSH1909	Non-Participating	4792937	453630
GSH1910	Non-Participating	4792877	453603
GSH1911	Non-Participating	4792690	453737
GSH1912	Non-Participating	4792423	453467
GSH1913	Non-Participating	4792382	453503
GSH1914	Non-Participating	4792409	453550
GSH1915	Non-Participating	4792053	453712
GSH1916	Non-Participating	4792045	453695
GSH1917	Non-Participating	4792024	453690
GSH1918	Non-Participating	4792008	453715
GSH1919	Non-Participating	4792041	453747
GSH1920	Non-Participating	4792026	454332
GSH1921	Non-Participating	4792034	454292
GSH1922	Non-Participating	4791977	454300
GSH1923	Non-Participating	4791934	454327
GSH1924	Non-Participating	4791640	453908
GSH1925	Non-Participating	4791599	453958
GSH1926	Non-Participating	4791632	453991
GSH1927	Non-Participating	4791250	454075
GSH1928	Non-Participating	4791284	454097
GSH1929	Non-Participating	4791272	454030
GSH1930	Non-Participating	4791040	454150
GSH1931	Non-Participating	4791029	454185
GSH1932	Non-Participating	4790995	454200
GSH1933	Non-Participating	4791000	454141
GSH1934	Non-Participating	4789819	453781
GSH1935	Non-Participating	4789826	453808
GSH1936	Non-Participating	4789706	453847
GSH1937	Non-Participating	4789655	453881
GSH1938	Non-Participating	4789661	453904
GSH1939	Non-Participating	4789692	453916
GSH1940	Non-Participating	4789648	453926
GSH1941	Non-Participating	4789720	453894
GSH1942	Non-Participating	4789712	453876
GSH1943	Non-Participating	4790392	454068
GSH1944	Non-Participating	4790376	454092
GSH1945	Non-Participating	4790372	454109
GSH1946	Non-Participating	4790402	454141
GSH1947	Non-Participating	4789891	454224
GSH1948	Non-Participating	4789912	454237

Receptor ID Number	Receptor Type	Easting	Northing
GSH1949	Non-Participating	4789942	454284
GSH1950	Non-Participating	4789942	454331
GSH1951	Non-Participating	4789915	454309
GSH200	Non-Participating	4805812	445477
GSH2000	Non-Participating	4791522	455800
GSH2004	Non-Participating	4791718	455751
GSH2005	Non-Participating	4791726	455807
GSH2006	Non-Participating	4792069	455636
GSH2007	Non-Participating	4792050	455640
GSH2008	Non-Participating	4792051	455698
GSH2009	Non-Participating	4792063	455756
GSH201	Non-Participating	4805823	445500
GSH2010	Non-Participating	4791996	455742
GSH2011	Non-Participating	4791974	455776
GSH2012	Non-Participating	4791967	456019
GSH2013	Non-Participating	4791982	456050
GSH2014	Non-Participating	4792045	456013
GSH2015	Non-Participating	4792400	455690
GSH2016	Non-Participating	4792342	455665
GSH2017	Non-Participating	4792365	455739
GSH2018	Non-Participating	4792318	455710
GSH2019	Non-Participating	4792676	455583
GSH202	Non-Participating	4805856	445601
GSH2020	Non-Participating	4792718	455605
GSH2021	Non-Participating	4792690	455647
GSH2022	Non-Participating	4792813	455810
GSH2023	Non-Participating	4792787	455844
GSH2024	Non-Participating	4792780	455876
GSH2025	Non-Participating	4792809	455776
GSH2026	Participating	4793152	455581
GSH2027	Participating	4793135	455553
GSH2028	Participating	4793122	455615
GSH2029	Non-Participating	4793223	455702
GSH203	Non-Participating	4805850	445629
GSH2030	Non-Participating	4793221	455747
GSH2031	Non-Participating	4793353	455614
GSH2032	Non-Participating	4793377	455625
GSH2033	Non-Participating	4793436	455631
GSH2034	Non-Participating	4793828	455618
GSH2035	Non-Participating	4793823	455654
GSH2036	Non-Participating	4793794	455655
GSH2037	Non-Participating	4793788	455626
GSH2038	Non-Participating	4793766	455628
GSH2039	Non-Participating	4793746	455631
GSH204	Non-Participating	4805372	445566
GSH2040	Non-Participating	4793750	455653
GSH2041	Non-Participating	4793725	455558
GSH2042	Non-Participating	4793712	455535
GSH2043	Non-Participating	4793688	455557
GSH2044	Non-Participating	4793695	455576
GSH2045	Non-Participating	4793625	455548
GSH2046	Non-Participating	4793651	455582
GSH2047	Non-Participating	4793589	455583
GSH2048	Non-Participating	4793534	455748
GSH2049	Non-Participating	4793566	455775
GSH205	Non-Participating	4805338	445555
GSH2050	Non-Participating	4793564	455731
GSH2051	Non-Participating	4793739	455528
GSH2052	Non-Participating	4793673	455521
GSH2053	Non-Participating	4794758	455299
GSH2054	Non-Participating	4794770	455538
GSH2055	Non-Participating	4794774	455566

Receptor ID Number	Receptor Type	Easting	Northing
GSH2056	Non-Participating	4794794	455585
GSH2057	Non-Participating	4794780	455664
GSH2058	Non-Participating	4794761	455569
GSH2059	Non-Participating	4794847	455493
GSH206	Non-Participating	4805399	445738
GSH2060	Non-Participating	4794893	455536
GSH2061	Non-Participating	4795139	455547
GSH2062	Non-Participating	4795177	455556
GSH2063	Non-Participating	4795215	455531
GSH2069	Participating	4795523	455223
GSH207	Non-Participating	4805415	445805
GSH2070	Participating	4795546	455252
GSH2071	Participating	4795533	455292
GSH2072	Non-Participating	4795568	455414
GSH2073	Non-Participating	4795522	455468
GSH2074	Non-Participating	4795511	455450
GSH2075	Non-Participating	4795732	455456
GSH2076	Non-Participating	4795749	455480
GSH2077	Non-Participating	4795778	455482
GSH2078	Non-Participating	4795734	455510
GSH2079	Non-Participating	4795800	455492
GSH208	Non-Participating	4805396	445832
GSH2080	Non-Participating	4795939	455210
GSH2081	Non-Participating	4795901	455178
GSH2082	Non-Participating	4795899	455214
GSH2083	Non-Participating	4795896	455234
GSH2084	Non-Participating	4796111	455035
GSH2085	Non-Participating	4796029	455073
GSH2086	Non-Participating	4796371	455345
GSH2087	Non-Participating	4796410	455382
GSH2088	Non-Participating	4796375	455421
GSH209	Non-Participating	4805404	445870
GSH2095	Non-Participating	4796717	454929
GSH2096	Non-Participating	4796704	454907
GSH2097	Non-Participating	4796786	455276
GSH2098	Non-Participating	4796831	455299
GSH2099	Non-Participating	4796815	455320
GSH210	Non-Participating	4805361	445832
GSH2100	Non-Participating	4796789	455350
GSH2101	Non-Participating	4797133	455008
GSH2102	Non-Participating	4797139	455039
GSH2103	Non-Participating	4797145	454958
GSH2104	Non-Participating	4797249	455276
GSH2105	Non-Participating	4797313	455291
GSH2106	Non-Participating	4797472	454834
GSH2107	Non-Participating	4797483	454861
GSH2108	Non-Participating	4797509	454897
GSH2109	Non-Participating	4797535	454906
GSH2110	Non-Participating	4797527	454843
GSH2111	Non-Participating	4797549	454778
GSH2112	Non-Participating	4797716	455095
GSH2113	Non-Participating	4797757	455128
GSH2114	Non-Participating	4797794	455090
GSH2115	Non-Participating	4797752	455087
GSH2116	Non-Participating	4798015	453965
GSH2117	Non-Participating	4798022	454023
GSH2118	Non-Participating	4798011	454045
GSH2119	Non-Participating	4798172	454350
GSH2120	Non-Participating	4798169	454401
GSH2121	Non-Participating	4798430	455028
GSH2122	Non-Participating	4798480	455062
GSH2123	Non-Participating	4798867	454513

Receptor ID Number	Receptor Type	Easting	Northing
GSH2124	Non-Participating	4798827	454529
GSH2125	Non-Participating	4798816	454554
GSH2126	Non-Participating	4800297	454274
GSH2127	Non-Participating	4800250	454284
GSH2128	Non-Participating	4800236	454293
GSH2129	Non-Participating	4800243	454384
GSH2130	Non-Participating	4800254	454387
GSH2131	Non-Participating	4800122	454456
GSH2132	Non-Participating	4800100	454468
GSH2133	Non-Participating	4800278	455415
GSH2134	Non-Participating	4800477	455638
GSH2135	Non-Participating	4800480	455668
GSH2136	Non-Participating	4800444	455650
GSH2137	Non-Participating	4800248	455854
GSH214	Non-Participating	4805020	445000
GSH215	Non-Participating	4805014	445022
GSH216	Non-Participating	4804541	445901
GSH217	Non-Participating	4804490	445847
GSH218	Non-Participating	4804531	445828
GSH219	Non-Participating	4804521	445798
GSH220	Non-Participating	4804500	445613
GSH221	Non-Participating	4804501	445572
GSH2216	Non-Participating	4791258	441306
GSH2217	Non-Participating	4791275	441441
GSH2218	Non-Participating	4791281	441461
GSH2219	Non-Participating	4791275	441421
GSH222	Non-Participating	4804291	445671
GSH2220	Participating	4791733	445750
GSH2221	Participating	4791713	445753
GSH2222	Participating	4791697	445755
GSH2223	Participating	4791749	445784
GSH2224	Participating	4791749	445754
GSH2225	Participating	4791758	445640
GSH2226	Non-Participating	4800293	455854
GSH2227	Non-Participating	4800259	454394
GSH2228	Non-Participating	4799641	450504
GSH2229	Non-Participating	4799596	450491
GSH223	Non-Participating	4804260	445676
GSH2230	Non-Participating	4799490	449351
GSH2236	Non-Participating	4796692	444159
GSH2237	Non-Participating	4796941	446154
GSH2238	Non-Participating	4796971	446156
GSH2239	Non-Participating	4796983	446175
GSH224	Non-Participating	4804239	445697
GSH2240	Non-Participating	4797962	453621
GSH2241	Non-Participating	4801760	450209
GSH2242	Non-Participating	4801634	450081
GSH2243	Non-Participating	4801625	450055
GSH2244	Non-Participating	4801634	450076
GSH2245	Non-Participating	4801592	450067
GSH2246	Non-Participating	4801636	449945
GSH2247	Non-Participating	4800960	446464
GSH2248	Non-Participating	4800968	446502
GSH2249	Non-Participating	4800946	446372
GSH225	Non-Participating	4804229	445714
GSH2250	Non-Participating	4800946	446416
GSH2255	Non-Participating	4804534	452015
GSH2256	Non-Participating	4804591	451980
GSH2257	Non-Participating	4804617	451967
GSH226	Non-Participating	4804193	445721
GSH2269	Non-Participating	4792170	439152
GSH227	Non-Participating	4804092	445861

Receptor ID Number	Receptor Type	Easting	Northing
GSH2270	Non-Participating	4792138	439137
GSH2273	Non-Participating	4789760	442659
GSH2274	Non-Participating	4791299	449803
GSH2275	Non-Participating	4791680	455724
GSH2279	Non-Participating	4789179	449234
GSH228	Non-Participating	4804115	445866
GSH2280	Non-Participating	4791469	437426
GSH2281	Non-Participating	4790648	437209
GSH2282	Non-Participating	4790195	437065
GSH2283	Non-Participating	4789037	436707
GSH2284	Non-Participating	4787693	436332
GSH2285	Non-Participating	4787426	436167
GSH2286	Non-Participating	4787376	436135
GSH2287	Non-Participating	4787352	436153
GSH2288	Non-Participating	4787385	435638
GSH2289	Non-Participating	4787145	435895
GSH229	Non-Participating	4804095	445881
GSH2290	Non-Participating	4786491	440027
GSH2291	Non-Participating	4786523	440052
GSH2292	Non-Participating	4786538	439927
GSH2293	Non-Participating	4786510	439880
GSH2294	Non-Participating	4786478	439852
GSH2295	Non-Participating	4786818	439980
GSH2296	Non-Participating	4786844	440018
GSH2302	Non-Participating	4798406	455070
GSH2303	Non-Participating	4799714	454798
GSH2304	Non-Participating	4799727	454765
GSH2305	Non-Participating	4799768	454802
GSH2306	Non-Participating	4804512	445570
GSH2307	Non-Participating	4803665	445684
GSH2323	Non-Participating	4794518	445115
GSH2324	Non-Participating	4793322	445170
GSH2334	Non-Participating	4804904	448073
GSH2335	Non-Participating	4804940	448073
GSH2336	Non-Participating	4804251	447835
GSH2337	Non-Participating	4804242	447838
GSH2338	Non-Participating	4804184	447752
GSH2339	Non-Participating	4800570	448089
GSH2340	Non-Participating	4798605	448568
GSH2341	Non-Participating	4794840	449179
GSH2342	Non-Participating	4794359	449460
GSH2343	Non-Participating	4792102	449583
GSH2344	Non-Participating	4792795	455909
GSH2345	Non-Participating	4793776	455651
GSH2346	Participating	4793448	453637
GSH2347	Non-Participating	4795412	453270
GSH2348	Non-Participating	4795421	453261
GSH2349	Non-Participating	4802656	451989
GSH2350	Non-Participating	4803433	452069
GSH2352	Non-Participating	4807202	449581
GSH2353	Non-Participating	4807186	449593
GSH2354	Non-Participating	4807236	449450
GSH2355	Non-Participating	4806769	449492
GSH2356	Non-Participating	4806476	449669
GSH2357	Non-Participating	4803948	449883
GSH2358	Non-Participating	4804018	449878
GSH2359	Non-Participating	4799511	450888
GSH236	Non-Participating	4803661	445723
GSH2360	Non-Participating	4801557	450444
GSH2361	Non-Participating	4802770	450291
GSH2362	Participating	4803374	449977
GSH2363	Non-Participating	4797594	450858

Receptor ID Number	Receptor Type	Easting	Northing
GSH2364	Non-Participating	4797518	450787
GSH2365	Non-Participating	4793067	451477
GSH2366	Non-Participating	4792959	451486
GSH2367	Non-Participating	4794608	451399
GSH2368	Non-Participating	4794622	451483
GSH2369	Non-Participating	4794657	451510
GSH237	Non-Participating	4803670	445756
GSH2370	Non-Participating	4794638	451423
GSH2371	Non-Participating	4795103	451311
GSH2372	Non-Participating	4795146	451284
GSH2373	Non-Participating	4798141	451005
GSH2374	Non-Participating	4799404	447817
GSH2379	Non-Participating	4798034	444593
GSH238	Non-Participating	4803669	445785
GSH2380	Non-Participating	4798053	444605
GSH2381	Non-Participating	4796605	446807
GSH2382	Non-Participating	4796596	446757
GSH2383	Non-Participating	4796107	446852
GSH2384	Non-Participating	4790142	447095
GSH2385	Non-Participating	4793830	447323
GSH2386	Non-Participating	4794884	447145
GSH2387	Non-Participating	4794912	447144
GSH2388	Non-Participating	4794911	447127
GSH239	Non-Participating	4803318	445742
GSH2391	Vacant Lot Non-Participating	4789350	450432
GSH2392	Vacant Lot Non-Participating	4789282	450236
GSH2393	Vacant Lot Non-Participating	4789307	450089
GSH2394	Vacant Lot Non-Participating	4789394	450046
GSH2395	Vacant Lot Non-Participating	4789235	449858
GSH2396	Vacant Lot Non-Participating	4789251	449587
GSH2398	Vacant Lot Non-Participating	4789131	448686
GSH2399	Vacant Lot Non-Participating	4789090	448425
GSH240	Non-Participating	4803339	445758
GSH2401	Vacant Lot Non-Participating	4788770	447410
GSH2403	Vacant Lot Non-Participating	4788963	447575
GSH2404	Vacant Lot Non-Participating	4788893	447107
GSH2405	Vacant Lot Non-Participating	4788802	446524
GSH241	Non-Participating	4803374	445766
GSH2412	Vacant Lot Non-Participating	4788961	441787
GSH2413	Vacant Lot Non-Participating	4787971	440712
GSH2414	Vacant Lot Participating	4787905	440232
GSH2416	Vacant Lot Participating	4788087	438675
GSH242	Non-Participating	4803380	445800
GSH2420	Vacant Lot Participating	4789310	438798
GSH2421	Vacant Lot Non-Participating	4787431	437122
GSH2422	Vacant Lot Non-Participating	4787494	436905
GSH2423	Vacant Lot Non-Participating	4787754	436604
GSH2424	Vacant Lot Non-Participating	4787726	436477
GSH2425	Vacant Lot Non-Participating	4787936	436520
GSH2426	Vacant Lot Non-Participating	4787575	437084
GSH2427	Vacant Lot Non-Participating	4788178	436628
GSH2428	Vacant Lot Non-Participating	4788946	436831
GSH2429	Vacant Lot Non-Participating	4789121	436867
GSH243	Non-Participating	4802403	445976
GSH2430	Vacant Lot Non-Participating	4789342	436800
GSH2431	Vacant Lot Non-Participating	4789605	437052
GSH2432	Vacant Lot Non-Participating	4789636	436916
GSH2433	Vacant Lot Non-Participating	4789801	436817
GSH2434	Vacant Lot Non-Participating	4790022	436993
GSH2435	Vacant Lot Non-Participating	4789846	436905
GSH2436	Vacant Lot Non-Participating	4789724	438851
GSH2437	Vacant Lot Participating	4790109	439057

Receptor ID Number	Receptor Type	Easting	Northing
GSH2438	Vacant Lot Participating	4790183	438903
GSH2439	Vacant Lot Participating	4790344	439106
GSH244	Non-Participating	4802319	446129
GSH2440	Vacant Lot Participating	4790565	438938
GSH2441	Vacant Lot Non-Participating	4790782	438956
GSH2442	Vacant Lot Non-Participating	4791413	439022
GSH2443	Vacant Lot Non-Participating	4791115	439163
GSH2445	Vacant Lot Non-Participating	4792030	439254
GSH245	Non-Participating	4802283	446147
GSH246	Participating	4802137	446192
GSH247	Participating	4802093	446217
GSH248	Participating	4802101	446257
GSH249	Non-Participating	4801337	446222
GSH250	Non-Participating	4801292	446226
GSH2500	Vacant Lot Non-Participating	4794545	442919
GSH251	Non-Participating	4801309	446247
GSH252	Non-Participating	4801309	446267
GSH253	Non-Participating	4801307	446309
GSH254	Non-Participating	4801331	446308
GSH2540	Vacant Lot Non-Participating	4806697	451691
GSH2541	Vacant Lot Non-Participating	4806914	451648
GSH2542	Vacant Lot Non-Participating	4807347	451634
GSH2545	Vacant Lot Non-Participating	4806049	452321
GSH2546	Vacant Lot Non-Participating	4806042	452205
GSH2547	Vacant Lot Non-Participating	4805986	451802
GSH2548	Vacant Lot Non-Participating	4805301	451917
GSH255	Non-Participating	4801340	446269
GSH2550	Vacant Lot Non-Participating	4805181	451938
GSH2556	Vacant Lot Non-Participating	4803964	452105
GSH2557	Vacant Lot Non-Participating	4802067	452381
GSH2558	Vacant Lot Non-Participating	4803373	452191
GSH2559	Vacant Lot Non-Participating	4803272	452214
GSH256	Non-Participating	4800903	446007
GSH2560	Vacant Lot Non-Participating	4802676	452292
GSH2561	Vacant Lot Non-Participating	4801940	452395
GSH2562	Vacant Lot Non-Participating	4801361	452473
GSH2563	Vacant Lot Non-Participating	4801149	452514
GSH2564	Vacant Lot Participating	4800249	454065
GSH2565	Vacant Lot Non-Participating	4798693	452883
GSH2566	Vacant Lot Non-Participating	4798479	454850
GSH2567	Vacant Lot Non-Participating	4798889	454801
GSH2568	Vacant Lot Participating	4799081	454778
GSH2569	Vacant Lot Non-Participating	4797885	452996
GSH257	Non-Participating	4800885	446024
GSH2570	Vacant Lot Non-Participating	4798136	454895
GSH2571	Vacant Lot Non-Participating	4796548	455137
GSH2572	Vacant Lot Non-Participating	4796333	455169
GSH2573	Vacant Lot Non-Participating	4795823	453320
GSH2574	Vacant Lot Non-Participating	4795718	455250
GSH2575	Vacant Lot Participating	4796624	453290
GSH2576	Vacant Lot Participating	4795134	455253
GSH2577	Vacant Lot Non-Participating	4794785	453502
GSH2579	Vacant Lot Non-Participating	4794079	454588
GSH258	Non-Participating	4800862	446014
GSH2580	Vacant Lot Non-Participating	4794092	454684
GSH2581	Vacant Lot Non-Participating	4794125	454907
GSH2582	Vacant Lot Participating	4794129	454955
GSH2583	Vacant Lot Non-Participating	4794217	454986
GSH2584	Vacant Lot Non-Participating	4794136	455065
GSH2585	Vacant Lot Non-Participating	4794313	455345
GSH2586	Vacant Lot Non-Participating	4794370	455404
GSH2587	Vacant Lot Non-Participating	4794173	455393

Receptor ID Number	Receptor Type	Easting	Northing
GSH2588	Vacant Lot Non-Participating	4794295	455388
GSH2589	Vacant Lot Non-Participating	4794219	455400
GSH259	Non-Participating	4800875	446061
GSH2590	Vacant Lot Non-Participating	4794179	455413
GSH2592	Vacant Lot Non-Participating	4793954	455546
GSH2593	Vacant Lot Non-Participating	4794074	455529
GSH2594	Vacant Lot Non-Participating	4794092	455535
GSH2595	Vacant Lot Non-Participating	4794109	455533
GSH2596	Vacant Lot Non-Participating	4794120	455536
GSH2597	Vacant Lot Non-Participating	4794193	455304
GSH2598	Vacant Lot Participating	4793828	455503
GSH260	Non-Participating	4800948	446375
GSH2601	Vacant Lot Participating	4792943	453725
GSH2603	Vacant Lot Non-Participating	4792539	453773
GSH2604	Vacant Lot Non-Participating	4792360	453810
GSH2605	Vacant Lot Non-Participating	4791743	453907
GSH2607	Vacant Lot Non-Participating	4791066	453831
GSH2608	Vacant Lot Participating	4791216	453806
GSH2609	Vacant Lot Non-Participating	4791520	453768
GSH261	Non-Participating	4800955	446413
GSH2610	Vacant Lot Non-Participating	4791724	453739
GSH2611	Vacant Lot Non-Participating	4791611	452687
GSH2612	Vacant Lot Non-Participating	4791502	451833
GSH2613	Vacant Lot Participating	4790619	451971
GSH2614	Vacant Lot Participating	4790468	452009
GSH2615	Vacant Lot Non-Participating	4791670	451847
GSH2616	Vacant Lot Non-Participating	4791769	452687
GSH2617	Vacant Lot Non-Participating	4792343	451721
GSH2618	Vacant Lot Participating	4792467	451707
GSH2619	Vacant Lot Non-Participating	4794103	453425
GSH262	Non-Participating	4800992	446413
GSH2620	Vacant Lot Non-Participating	4793756	452021
GSH2621	Vacant Lot Non-Participating	4794207	453421
GSH2622	Vacant Lot Non-Participating	4794327	453396
GSH2623	Vacant Lot Non-Participating	4794456	453361
GSH2624	Vacant Lot Non-Participating	4795134	453236
GSH2625	Vacant Lot Non-Participating	4795821	453153
GSH2626	Vacant Lot Non-Participating	4795364	451263
GSH2627	Vacant Lot Non-Participating	4794906	451333
GSH2628	Vacant Lot Non-Participating	4795697	451209
GSH263	Non-Participating	4800649	446135
GSH2630	Vacant Lot Non-Participating	4796335	451132
GSH2631	Vacant Lot Non-Participating	4796663	451070
GSH2632	Vacant Lot Non-Participating	4797600	450932
GSH2634	Vacant Lot Participating	4798013	452807
GSH2635	Vacant Lot Non-Participating	4799781	452250
GSH2637	Vacant Lot Non-Participating	4801702	450324
GSH2638	Vacant Lot Non-Participating	4801996	451863
GSH2639	Vacant Lot Non-Participating	4801885	450341
GSH264	Non-Participating	4800620	446106
GSH2640	Vacant Lot Non-Participating	4802451	450278
GSH2641	Vacant Lot Non-Participating	4802963	450141
GSH2642	Vacant Lot Non-Participating	4802655	450245
GSH2643	Vacant Lot Non-Participating	4803349	452076
GSH2644	Vacant Lot Non-Participating	4802364	452225
GSH2645	Vacant Lot Participating	4803944	451989
GSH2646	Vacant Lot Participating	4804424	449959
GSH2647	Vacant Lot Non-Participating	4805104	451822
GSH2648	Vacant Lot Non-Participating	4805188	451817
GSH2649	Vacant Lot Participating	4805296	449861
GSH265	Non-Participating	4800590	446123
GSH2650	Vacant Lot Non-Participating	4805861	449778

Receptor ID Number	Receptor Type	Easting	Northing
GSH2651	Vacant Lot Non-Participating	4807140	451491
GSH2657	Vacant Lot Non-Participating	4806177	449599
GSH2658	Vacant Lot Non-Participating	4805824	449630
GSH2659	Vacant Lot Non-Participating	4805340	447767
GSH266	Non-Participating	4800604	446148
GSH2660	Vacant Lot Non-Participating	4805613	448632
GSH2661	Vacant Lot Non-Participating	4805649	448704
GSH2662	Vacant Lot Non-Participating	4805247	447805
GSH2663	Vacant Lot Non-Participating	4804663	449791
GSH2664	Vacant Lot Non-Participating	4804415	449849
GSH2665	Vacant Lot Non-Participating	4802988	448061
GSH2666	Vacant Lot Non-Participating	4802750	448157
GSH2667	Vacant Lot Non-Participating	4802576	448170
GSH2669	Vacant Lot Non-Participating	4801727	450021
GSH267	Non-Participating	4800652	446397
GSH2670	Vacant Lot Non-Participating	4800983	448403
GSH2672	Vacant Lot Participating	4800353	448477
GSH2673	Vacant Lot Participating	4800147	448494
GSH2674	Vacant Lot Non-Participating	4799743	449954
GSH2675	Vacant Lot Non-Participating	4799946	451784
GSH2676	Vacant Lot Non-Participating	4799736	450328
GSH2677	Vacant Lot Non-Participating	4799556	449209
GSH2678	Vacant Lot Non-Participating	4799535	449143
GSH2679	Vacant Lot Non-Participating	4799452	449101
GSH268	Non-Participating	4800629	446391
GSH2681	Vacant Lot Non-Participating	4800796	448266
GSH2683	Vacant Lot Non-Participating	4801353	448161
GSH2684	Vacant Lot Non-Participating	4801316	447655
GSH2685	Vacant Lot Non-Participating	4801388	447364
GSH2686	Vacant Lot Non-Participating	4800142	448336
GSH2687	Vacant Lot Non-Participating	4799793	448319
GSH2689	Vacant Lot Non-Participating	4799719	448388
GSH269	Non-Participating	4800609	446395
GSH2690	Vacant Lot Non-Participating	4799707	448283
GSH2691	Vacant Lot Non-Participating	4799689	448163
GSH2692	Vacant Lot Non-Participating	4799663	448028
GSH2693	Vacant Lot Non-Participating	4799602	448118
GSH2694	Vacant Lot Non-Participating	4799557	448349
GSH2695	Vacant Lot Non-Participating	4799542	448393
GSH2696	Vacant Lot Non-Participating	4799518	448151
GSH2697	Vacant Lot Non-Participating	4799320	448093
GSH2698	Vacant Lot Non-Participating	4799345	448140
GSH2699	Vacant Lot Non-Participating	4799308	448141
GSH270	Non-Participating	4800560	446423
GSH2700	Vacant Lot Non-Participating	4799229	448128
GSH2701	Vacant Lot Non-Participating	4799068	448496
GSH2702	Vacant Lot Non-Participating	4799145	448486
GSH2703	Vacant Lot Non-Participating	4798883	448624
GSH2704	Vacant Lot Non-Participating	4798826	448650
GSH2705	Vacant Lot Non-Participating	4798793	448650
GSH2706	Vacant Lot Non-Participating	4799364	448870
GSH2707	Vacant Lot Non-Participating	4799444	448967
GSH2708	Vacant Lot Non-Participating	4799444	449006
GSH2709	Vacant Lot Non-Participating	4799460	449026
GSH271	Non-Participating	4800365	446073
GSH2710	Vacant Lot Non-Participating	4799482	448362
GSH2711	Vacant Lot Non-Participating	4799238	448216
GSH2712	Vacant Lot Non-Participating	4799332	448346
GSH2713	Vacant Lot Non-Participating	4799327	448325
GSH2714	Vacant Lot Non-Participating	4799254	448690
GSH2715	Vacant Lot Non-Participating	4799558	448749
GSH2716	Vacant Lot Non-Participating	4799529	449047

Receptor ID Number	Receptor Type	Easting	Northing
GSH2717	Vacant Lot Non-Participating	4799563	448638
GSH2718	Vacant Lot Non-Participating	4799685	448560
GSH2719	Vacant Lot Non-Participating	4798890	448532
GSH272	Non-Participating	4800322	446073
GSH2722	Vacant Lot Non-Participating	4798529	448744
GSH2723	Vacant Lot Non-Participating	4798715	448677
GSH2724	Vacant Lot Non-Participating	4797318	450803
GSH2726	Vacant Lot Non-Participating	4796559	450951
GSH2728	Vacant Lot Non-Participating	4795671	449158
GSH273	Non-Participating	4800363	446115
GSH2730	Vacant Lot Non-Participating	4795060	449309
GSH2734	Vacant Lot Non-Participating	4794881	451195
GSH2735	Vacant Lot Non-Participating	4794705	451229
GSH2736	Vacant Lot Non-Participating	4794188	449374
GSH2737	Vacant Lot Non-Participating	4794348	449197
GSH2738	Vacant Lot Non-Participating	4793121	451489
GSH2739	Vacant Lot Non-Participating	4792874	451509
GSH274	Non-Participating	4800361	446152
GSH2740	Vacant Lot Non-Participating	4792805	449577
GSH2741	Vacant Lot Non-Participating	4792596	449614
GSH2742	Vacant Lot Non-Participating	4791946	449708
GSH2744	Vacant Lot Participating	4790942	449887
GSH2745	Vacant Lot Non-Participating	4791494	451687
GSH2746	Vacant Lot Non-Participating	4791072	451741
GSH2747	Vacant Lot Non-Participating	4790551	449937
GSH2748	Vacant Lot Non-Participating	4790401	449954
GSH2749	Vacant Lot Non-Participating	4790478	451850
GSH275	Non-Participating	4800302	446400
GSH2751	Vacant Lot Non-Participating	4789844	447779
GSH2752	Vacant Lot Participating	4791116	449605
GSH2753	Vacant Lot Non-Participating	4790428	447900
GSH2754	Vacant Lot Non-Participating	4790347	447924
GSH2755	Vacant Lot Non-Participating	4790235	447937
GSH2756	Vacant Lot Non-Participating	4793200	449372
GSH2757	Vacant Lot Non-Participating	4792937	449397
GSH2759	Vacant Lot Participating	4791074	447756
GSH276	Non-Participating	4800274	446442
GSH2761	Vacant Lot Non-Participating	4791982	447604
GSH2762	Vacant Lot Participating	4791984	447469
GSH2763	Vacant Lot Non-Participating	4792077	447589
GSH2764	Vacant Lot Participating	4792370	447536
GSH2766	Vacant Lot Participating	4793619	449316
GSH2767	Vacant Lot Participating	4793554	447579
GSH2768	Vacant Lot Non-Participating	4794036	449232
GSH277	Non-Participating	4800297	446455
GSH2770	Vacant Lot Non-Participating	4795145	449090
GSH2771	Vacant Lot Non-Participating	4795268	449064
GSH2772	Vacant Lot Non-Participating	4794729	447181
GSH2773	Vacant Lot Non-Participating	4794151	447272
GSH2774	Vacant Lot Non-Participating	4795421	448993
GSH2775	Vacant Lot Non-Participating	4795634	448956
GSH2776	Vacant Lot Non-Participating	4796099	448910
GSH2777	Vacant Lot Non-Participating	4796861	448814
GSH2778	Vacant Lot Non-Participating	4797264	448761
GSH278	Non-Participating	4800296	446484
GSH2780	Vacant Lot Non-Participating	4796403	446976
GSH2781	Vacant Lot Non-Participating	4797659	448735
GSH279	Non-Participating	4800262	446473
GSH2790	Vacant Lot Non-Participating	4799402	447587
GSH2791	Vacant Lot Non-Participating	4801841	446169
GSH2792	Vacant Lot Non-Participating	4802709	446102
GSH2793	Vacant Lot Non-Participating	4803358	447891

Receptor ID Number	Receptor Type	Easting	Northing
GSH2794	Vacant Lot Non-Participating	4802577	448013
GSH2795	Vacant Lot Participating	4802358	448045
GSH2796	Vacant Lot Participating	4803520	447883
GSH2797	Vacant Lot Non-Participating	4803711	447849
GSH2798	Vacant Lot Non-Participating	4804722	445795
GSH280	Non-Participating	4800235	446509
GSH2806	Vacant Lot Non-Participating	4805795	447550
GSH281	Non-Participating	4800194	446515
GSH2811	Vacant Lot Non-Participating	4805017	445017
GSH2812	Vacant Lot Non-Participating	4804655	445603
GSH2813	Vacant Lot Non-Participating	4804077	445682
GSH2815	Vacant Lot Non-Participating	4803092	445828
GSH2819	Vacant Lot Non-Participating	4802260	445989
GSH2841	Vacant Lot Non-Participating	4798024	446536
GSH2844	Vacant Lot Non-Participating	4797044	445682
GSH2845	Vacant Lot Non-Participating	4796944	444817
GSH2846	Vacant Lot Non-Participating	4797460	444726
GSH2847	Vacant Lot Non-Participating	4797597	444688
GSH2848	Vacant Lot Non-Participating	4796977	444622
GSH2849	Vacant Lot Non-Participating	4797164	444592
GSH2850	Vacant Lot Non-Participating	4797580	444530
GSH2851	Vacant Lot Non-Participating	4797772	444522
GSH2857	Vacant Lot Non-Participating	4797019	446701
GSH2858	Vacant Lot Non-Participating	4796748	444676
GSH2859	Vacant Lot Non-Participating	4796698	444380
GSH2861	Vacant Lot Non-Participating	4796332	446814
GSH2862	Vacant Lot Non-Participating	4795546	446926
GSH2863	Vacant Lot Participating	4795176	446968
GSH2864	Vacant Lot Participating	4794947	447005
GSH2865	Vacant Lot Participating	4794743	447038
GSH2866	Vacant Lot Participating	4794527	447076
GSH2867	Vacant Lot Participating	4794872	445146
GSH2868	Vacant Lot Participating	4795341	445018
GSH2870	Vacant Lot Non-Participating	4794847	444900
GSH2871	Vacant Lot Non-Participating	4794785	444376
GSH2873	Vacant Lot Non-Participating	4795276	444871
GSH2874	Vacant Lot Non-Participating	4795587	444821
GSH2877	Vacant Lot Non-Participating	4793737	447192
GSH2878	Vacant Lot Participating	4793546	447213
GSH2879	Vacant Lot Non-Participating	4792930	446247
GSH2880	Vacant Lot Non-Participating	4793244	445300
GSH2881	Vacant Lot Participating	4794137	445181
GSH2885	Vacant Lot Participating	4792560	443361
GSH2886	Vacant Lot Participating	4792693	444414
GSH2887	Vacant Lot Non-Participating	4792776	445038
GSH2888	Vacant Lot Non-Participating	4792647	445096
GSH2889	Vacant Lot Non-Participating	4792655	445225
GSH2890	Vacant Lot Participating	4792472	445416
GSH2891	Vacant Lot Non-Participating	4792572	445416
GSH2892	Vacant Lot Non-Participating	4792618	445391
GSH2893	Vacant Lot Non-Participating	4792664	445374
GSH2894	Vacant Lot Non-Participating	4792714	445749
GSH2895	Vacant Lot Non-Participating	4792710	445406
GSH2896	Vacant Lot Non-Participating	4792824	445378
GSH2897	Vacant Lot Participating	4790890	446572
GSH2898	Vacant Lot Non-Participating	4792335	445212
GSH2902	Vacant Lot Participating	4791470	445437
GSH2903	Vacant Lot Non-Participating	4790638	444701
GSH2904	Vacant Lot Non-Participating	4791308	443528
GSH2905	Vacant Lot Non-Participating	4791507	443503
GSH2906	Vacant Lot Participating	4792373	443374
GSH2907	Vacant Lot Participating	4790892	447627

Receptor ID Number	Receptor Type	Easting	Northing
GSH2908	Vacant Lot Non-Participating	4790500	447675
GSH2909	Vacant Lot Non-Participating	4789766	445677
GSH2910	Vacant Lot Non-Participating	4789697	443618
GSH2911	Vacant Lot Non-Participating	4789831	441685
GSH2912	Vacant Lot Non-Participating	4789981	441656
GSH2913	Vacant Lot Participating	4790205	441635
GSH2914	Vacant Lot Non-Participating	4790393	442954
GSH2915	Vacant Lot Participating	4790651	441539
GSH2916	Vacant Lot Non-Participating	4788189	441865
GSH2917	Vacant Lot Non-Participating	4788169	441868
GSH2918	Vacant Lot Non-Participating	4788111	442118
GSH2919	Vacant Lot Non-Participating	4791133	443390
GSH2921	Vacant Lot Non-Participating	4791736	443291
GSH2922	Vacant Lot Participating	4792335	443187
GSH2923	Vacant Lot Non-Participating	4791004	441502
GSH2926	Vacant Lot Non-Participating	4793674	440936
GSH2928	Vacant Lot Non-Participating	4792468	441119
GSH2929	Vacant Lot Non-Participating	4792285	441153
GSH2930	Vacant Lot Participating	4790176	441419
GSH2931	Vacant Lot Non-Participating	4790996	441315
GSH2932	Vacant Lot Non-Participating	4792654	441235
GSH2934	Vacant Lot Non-Participating	4805667	445492
GSH2937	Vacant Lot Non-Participating	4799803	450657
GSH2938	Vacant Lot Non-Participating	4802214	446113
GSH2941	Vacant Lot Non-Participating	4789879	454021
GSH2945	Vacant Lot Participating	4794218	444970
GSH2947	Vacant Lot Non-Participating	4796643	455120
GSH2948	Vacant Lot Non-Participating	4798358	454876
GSH2949	Vacant Lot Non-Participating	4797688	451542
GSH2950	Vacant Lot Non-Participating	4793821	451374
GSH2951	Vacant Lot Non-Participating	4799506	450539
GSH2952	Vacant Lot Non-Participating	4787953	441637
GSH2953	Vacant Lot Non-Participating	4787934	441542
GSH2955	Vacant Lot Participating	4790935	447776
GSH2956	Vacant Lot Non-Participating	4789981	449997
GSH2957	Vacant Lot Non-Participating	4798017	453892
GSH2958	Vacant Lot Non-Participating	4799216	448696
GSH2959	Vacant Lot Non-Participating	4806090	451792
GSH2963	Vacant Lot Non-Participating	4794253	451445
GSH2966	Vacant Lot Non-Participating	4796108	455190
GSH2967	Vacant Lot Non-Participating	4794098	454736
GSH2968	Vacant Lot Non-Participating	4794104	454781
GSH2969	Vacant Lot Non-Participating	4794104	454824
GSH2970	Vacant Lot Non-Participating	4794114	454871
GSH2971	Vacant Lot Non-Participating	4794130	455001
GSH2972	Vacant Lot Non-Participating	4794143	455133
GSH2973	Vacant Lot Non-Participating	4794154	455234
GSH2974	Vacant Lot Non-Participating	4794157	455276
GSH2975	Vacant Lot Non-Participating	4794165	455313
GSH2976	Vacant Lot Non-Participating	4794223	455345
GSH2977	Vacant Lot Non-Participating	4794543	455467
GSH2978	Vacant Lot Non-Participating	4794421	455487
GSH2979	Vacant Lot Non-Participating	4794392	455492
GSH2980	Vacant Lot Non-Participating	4794365	455498
GSH2981	Vacant Lot Non-Participating	4794349	455500
GSH2982	Vacant Lot Non-Participating	4794323	455504
GSH2983	Vacant Lot Non-Participating	4794299	455505
GSH2984	Vacant Lot Non-Participating	4794277	455509
GSH2985	Vacant Lot Non-Participating	4794261	455512
GSH2986	Vacant Lot Non-Participating	4794241	455513
GSH2987	Vacant Lot Non-Participating	4794183	455525
GSH2988	Vacant Lot Non-Participating	4794176	455480

Receptor ID Number	Receptor Type	Easting	Northing
GSH2989	Vacant Lot Non-Participating	4794175	455463
GSH2990	Vacant Lot Non-Participating	4794172	455446
GSH2991	Vacant Lot Non-Participating	4794245	455433
GSH2992	Vacant Lot Non-Participating	4794269	455432
GSH2993	Vacant Lot Non-Participating	4794304	455427
GSH2994	Vacant Lot Non-Participating	4794133	455505
GSH2995	Vacant Lot Non-Participating	4794060	455543
GSH2996	Vacant Lot Non-Participating	4794037	455547
GSH2997	Vacant Lot Non-Participating	4794014	455551
GSH2998	Vacant Lot Non-Participating	4793986	455555
GSH2999	Vacant Lot Non-Participating	4794134	455490
GSH3000	Vacant Lot Non-Participating	4794133	455470
GSH3001	Vacant Lot Non-Participating	4794126	455420
GSH3002	Vacant Lot Non-Participating	4794122	455380
GSH3003	Vacant Lot Non-Participating	4794118	455351
GSH3004	Vacant Lot Non-Participating	4794106	455321
GSH3005	Vacant Lot Non-Participating	4794101	455297
GSH3006	Vacant Lot Non-Participating	4794096	455272
GSH3007	Vacant Lot Participating	4792852	451623
GSH3008	Vacant Lot Non-Participating	4795962	453149
GSH3009	Vacant Lot Non-Participating	4798145	450855
GSH3010	Vacant Lot Non-Participating	4799796	451808
GSH3011	Vacant Lot Non-Participating	4789373	450831
GSH3012	Vacant Lot Non-Participating	4789310	450148
GSH3013	Vacant Lot Non-Participating	4789434	450047
GSH3014	Vacant Lot Non-Participating	4789470	450039
GSH3015	Vacant Lot Non-Participating	4789521	450032
GSH3016	Vacant Lot Non-Participating	4789254	450006
GSH3017	Vacant Lot Non-Participating	4789249	449974
GSH3018	Vacant Lot Non-Participating	4789242	449942
GSH3019	Vacant Lot Non-Participating	4789238	449913
GSH3020	Vacant Lot Non-Participating	4789295	450003
GSH3021	Vacant Lot Non-Participating	4789222	449794
GSH3022	Vacant Lot Non-Participating	4792982	451509
GSH3023	Vacant Lot Non-Participating	4789175	449300
GSH3025	Vacant Lot Non-Participating	4790250	447720
GSH3026	Vacant Lot Non-Participating	4792695	445619
GSH3027	Vacant Lot Non-Participating	4792725	445540
GSH3028	Vacant Lot Non-Participating	4792721	445482
GSH3029	Vacant Lot Non-Participating	4792721	445435
GSH3030	Vacant Lot Non-Participating	4792800	445559
GSH3031	Vacant Lot Non-Participating	4792796	445514
GSH3032	Vacant Lot Non-Participating	4792790	445483
GSH3033	Vacant Lot Non-Participating	4792783	445444
GSH3034	Vacant Lot Non-Participating	4792771	445381
GSH3035	Vacant Lot Non-Participating	4792759	445339
GSH3036	Vacant Lot Non-Participating	4792814	445331
GSH3037	Vacant Lot Non-Participating	4792810	445279
GSH3038	Vacant Lot Non-Participating	4792752	445291
GSH3039	Vacant Lot Non-Participating	4792738	445187
GSH3040	Vacant Lot Non-Participating	4792735	445103
GSH3041	Vacant Lot Non-Participating	4792656	445033
GSH3042	Vacant Lot Non-Participating	4792673	445141
GSH3043	Vacant Lot Non-Participating	4792699	445298
GSH3044	Vacant Lot Non-Participating	4792625	445309
GSH3045	Vacant Lot Non-Participating	4792536	445321
GSH3046	Vacant Lot Non-Participating	4792459	445333
GSH3047	Vacant Lot Non-Participating	4792354	445350
GSH3048	Vacant Lot Non-Participating	4792327	445353
GSH3049	Vacant Lot Non-Participating	4792383	445401
GSH3050	Vacant Lot Non-Participating	4792881	445326
GSH3051	Vacant Lot Non-Participating	4796960	446180

Receptor ID Number	Receptor Type	Easting	Northing
GSH3067	Vacant Lot Non-Participating	4788022	441275
GSH3068	Vacant Lot Non-Participating	4789583	438962
GSH3069	Vacant Lot Participating	4790133	441504
GSH3080	Vacant Lot Non-Participating	4806178	447537
GSH3081	Vacant Lot Non-Participating	4805364	446661
GSH3082	Vacant Lot Non-Participating	4804277	445662
GSH3084	Vacant Lot Participating	4801796	448237
GSH3085	Vacant Lot Non-Participating	4800680	446184
GSH3087	Vacant Lot Non-Participating	4799428	448035
GSH326	Non-Participating	4797589	446560
GSH327	Non-Participating	4797569	446565
GSH328	Non-Participating	4797603	446594
GSH329	Non-Participating	4797579	446629
GSH330	Non-Participating	4797565	446745
GSH331	Non-Participating	4797613	446740
GSH332	Non-Participating	4797288	446791
GSH333	Non-Participating	4797357	446849
GSH334	Non-Participating	4797357	446815
GSH335	Non-Participating	4797100	446801
GSH336	Non-Participating	4797002	446925
GSH337	Non-Participating	4796983	446917
GSH338	Non-Participating	4796957	446947
GSH339	Non-Participating	4796894	446928
GSH340	Non-Participating	4796927	446924
GSH341	Non-Participating	4796612	446730
GSH342	Non-Participating	4796597	446758
GSH343	Non-Participating	4796152	446797
GSH344	Non-Participating	4796191	446860
GSH345	Participating	4796071	447175
GSH346	Participating	4796114	447211
GSH347	Participating	4796046	447126
GSH348	Non-Participating	4795693	446890
GSH349	Non-Participating	4795666	446887
GSH350	Non-Participating	4795634	446911
GSH351	Participating	4795831	447041
GSH352	Participating	4795818	447056
GSH353	Participating	4795841	447052
GSH354	Participating	4795874	447050
GSH355	Participating	4794713	445808
GSH356	Non-Participating	4794335	447079
GSH357	Non-Participating	4794327	447104
GSH358	Non-Participating	4794355	447121
GSH359	Participating	4794180	447126
GSH360	Participating	4794164	447156
GSH361	Non-Participating	4793914	447132
GSH362	Non-Participating	4793917	447174
GSH363	Non-Participating	4793881	447156
GSH364	Non-Participating	4793848	447199
GSH365	Non-Participating	4793902	447206
GSH366	Non-Participating	4793656	447368
GSH367	Non-Participating	4793197	447210
GSH368	Non-Participating	4793185	447237
GSH369	Non-Participating	4793216	447245
GSH370	Non-Participating	4793224	447294
GSH371	Non-Participating	4792987	447223
GSH372	Non-Participating	4792956	447240
GSH373	Non-Participating	4792902	447221
GSH374	Non-Participating	4792889	447251
GSH375	Non-Participating	4792490	447260
GSH376	Non-Participating	4792507	447327
GSH377	Non-Participating	4791437	447478
GSH378	Non-Participating	4791405	447482

Receptor ID Number	Receptor Type	Easting	Northing
GSH379	Non-Participating	4791418	447523
GSH380	Non-Participating	4791410	447548
GSH381	Non-Participating	4791381	447539
GSH382	Non-Participating	4791043	447606
GSH383	Non-Participating	4791028	447565
GSH384	Non-Participating	4791040	447573
GSH385	Non-Participating	4790558	447885
GSH386	Non-Participating	4790538	447930
GSH387	Non-Participating	4788974	447384
GSH388	Non-Participating	4788916	447354
GSH389	Non-Participating	4788935	447411
GSH39	Non-Participating	4787095	435873
GSH393	Non-Participating	4788826	446788
GSH394	Non-Participating	4788864	446801
GSH395	Non-Participating	4788902	448464
GSH396	Non-Participating	4788870	448456
GSH397	Non-Participating	4788869	448504
GSH398	Non-Participating	4788840	448500
GSH399	Non-Participating	4789252	448784
GSH40	Non-Participating	4787124	435859
GSH400	Non-Participating	4789207	448781
GSH401	Non-Participating	4789182	448821
GSH402	Non-Participating	4789013	448706
GSH403	Non-Participating	4788967	448740
GSH404	Non-Participating	4788983	448781
GSH41	Non-Participating	4787135	435875
GSH42	Non-Participating	4787164	435880
GSH43	Non-Participating	4787195	435890
GSH44	Non-Participating	4787234	435919
GSH45	Non-Participating	4787183	435811
GSH456	Non-Participating	4789646	445858
GSH457	Non-Participating	4789675	445868
GSH458	Non-Participating	4789690	445866
GSH459	Non-Participating	4789721	445873
GSH46	Non-Participating	4787168	435811
GSH460	Non-Participating	4789714	445914
GSH461	Non-Participating	4789730	445910
GSH462	Non-Participating	4789747	445907
GSH463	Non-Participating	4789762	445905
GSH464	Non-Participating	4789994	445492
GSH465	Non-Participating	4790013	445539
GSH466	Non-Participating	4790030	445513
GSH467	Non-Participating	4790064	445535
GSH468	Non-Participating	4790111	445531
GSH469	Non-Participating	4790061	445600
GSH47	Non-Participating	4787163	435823
GSH470	Non-Participating	4790039	445625
GSH471	Non-Participating	4790092	445775
GSH472	Non-Participating	4790110	445766
GSH473	Non-Participating	4790126	445791
GSH474	Non-Participating	4790142	445741
GSH475	Non-Participating	4790613	445532
GSH476	Non-Participating	4790654	445515
GSH477	Non-Participating	4790924	445489
GSH478	Non-Participating	4790901	445473
GSH479	Non-Participating	4790920	445542
GSH48	Non-Participating	4787258	435924
GSH480	Non-Participating	4791300	445424
GSH481	Non-Participating	4791311	445500
GSH482	Participating	4791230	445658
GSH483	Participating	4791234	445682
GSH484	Participating	4791214	445705

Receptor ID Number	Receptor Type	Easting	Northing
GSH485	Participating	4791244	445737
GSH486	Participating	4791269	445711
GSH487	Participating	4791261	445681
GSH488	Participating	4791278	445727
GSH489	Participating	4791705	444912
GSH49	Non-Participating	4787291	435954
GSH490	Participating	4791728	444952
GSH491	Participating	4791677	444970
GSH492	Participating	4791633	444890
GSH493	Participating	4791653	444879
GSH494	Participating	4791672	444877
GSH495	Non-Participating	4791940	445487
GSH496	Non-Participating	4791981	445490
GSH497	Participating	4792062	445495
GSH498	Participating	4792068	445515
GSH499	Participating	4792077	445626
GSH50	Non-Participating	4787584	435804
GSH500	Participating	4792106	445533
GSH501	Participating	4792130	445541
GSH502	Participating	4792133	445576
GSH503	Participating	4792116	445561
GSH504	Participating	4792102	445476
GSH505	Participating	4792094	445370
GSH506	Participating	4792052	445336
GSH507	Non-Participating	4792202	445354
GSH508	Non-Participating	4792198	445321
GSH509	Non-Participating	4792822	445698
GSH51	Non-Participating	4787456	435974
GSH510	Non-Participating	4792839	445700
GSH511	Participating	4792910	445205
GSH512	Non-Participating	4793124	445216
GSH513	Non-Participating	4793008	445320
GSH514	Non-Participating	4793002	445379
GSH515	Non-Participating	4793006	445395
GSH516	Non-Participating	4793028	445384
GSH517	Non-Participating	4793044	445349
GSH518	Non-Participating	4792994	445368
GSH519	Non-Participating	4793319	445141
GSH52	Non-Participating	4787481	435980
GSH520	Non-Participating	4793365	445122
GSH521	Non-Participating	4793358	445162
GSH522	Non-Participating	4793796	445102
GSH523	Non-Participating	4793778	445244
GSH524	Non-Participating	4793737	445268
GSH525	Non-Participating	4793784	445273
GSH526	Non-Participating	4793771	445293
GSH527	Non-Participating	4793770	445338
GSH528	Non-Participating	4793800	445334
GSH529	Non-Participating	4793802	445320
GSH53	Non-Participating	4787656	436078
GSH530	Participating	4794499	444368
GSH531	Participating	4794564	444408
GSH532	Participating	4794579	444404
GSH533	Non-Participating	4794251	445158
GSH534	Non-Participating	4794254	445190
GSH535	Non-Participating	4794286	445204
GSH536	Non-Participating	4794553	445186
GSH537	Non-Participating	4794547	445127
GSH538	Non-Participating	4794483	445005
GSH539	Non-Participating	4794507	445006
GSH54	Non-Participating	4787567	436116
GSH540	Non-Participating	4794535	444958

Receptor ID Number	Receptor Type	Easting	Northing
GSH541	Non-Participating	4795496	444946
GSH542	Non-Participating	4795508	444994
GSH543	Non-Participating	4796000	444739
GSH544	Non-Participating	4796014	444765
GSH545	Non-Participating	4795961	444759
GSH546	Non-Participating	4795964	444778
GSH547	Non-Participating	4795919	444727
GSH548	Non-Participating	4795990	444807
GSH549	Participating	4795827	444903
GSH55	Non-Participating	4787603	436195
GSH550	Non-Participating	4796385	444751
GSH551	Non-Participating	4796357	444766
GSH552	Non-Participating	4796278	444898
GSH553	Non-Participating	4796297	444852
GSH554	Non-Participating	4796293	444828
GSH555	Non-Participating	4796276	444873
GSH556	Non-Participating	4796584	444800
GSH557	Non-Participating	4796571	444835
GSH558	Non-Participating	4796611	444866
GSH559	Non-Participating	4796896	444673
GSH56	Non-Participating	4787609	436220
GSH560	Non-Participating	4796876	445376
GSH561	Non-Participating	4796853	445397
GSH562	Non-Participating	4796829	445369
GSH563	Non-Participating	4796844	445345
GSH564	Non-Participating	4797953	444506
GSH565	Non-Participating	4798017	444600
GSH566	Non-Participating	4798011	444612
GSH567	Non-Participating	4798053	444605
GSH568	Non-Participating	4797735	444626
GSH569	Non-Participating	4797740	444645
GSH57	Non-Participating	4787656	436266
GSH570	Non-Participating	4797729	444646
GSH58	Non-Participating	4787695	436295
GSH59	Non-Participating	4787732	436325
GSH60	Non-Participating	4787803	436364
GSH61	Non-Participating	4787821	436378
GSH62	Non-Participating	4788419	436507
GSH63	Non-Participating	4788439	436535
GSH64	Non-Participating	4788408	436562
GSH65	Non-Participating	4788596	436572
GSH66	Non-Participating	4788657	436562
GSH67	Non-Participating	4788628	436544
GSH68	Non-Participating	4788801	436556
GSH69	Non-Participating	4788805	436632
GSH70	Non-Participating	4788807	436664
GSH71	Non-Participating	4789108	436718
GSH72	Non-Participating	4789147	436705
GSH73	Non-Participating	4789096	436756
GSH74	Non-Participating	4789537	436812
GSH75	Non-Participating	4789559	436813
GSH757	Participating	4789026	439156
GSH758	Participating	4789001	439200
GSH759	Participating	4788974	439153
GSH76	Non-Participating	4789585	436839
GSH760	Participating	4789008	439120
GSH761	Non-Participating	4789407	439208
GSH762	Non-Participating	4789459	439271
GSH763	Non-Participating	4789483	439279
GSH764	Non-Participating	4789459	439295
GSH765	Non-Participating	4789435	439291
GSH766	Non-Participating	4788410	439465

Receptor ID Number	Receptor Type	Easting	Northing
GSH767	Non-Participating	4788382	439476
GSH768	Non-Participating	4788418	439509
GSH769	Non-Participating	4788402	439554
GSH77	Non-Participating	4789554	436868
GSH770	Participating	4788041	439643
GSH771	Participating	4787986	439692
GSH772	Non-Participating	4787271	439315
GSH773	Non-Participating	4787218	439334
GSH774	Non-Participating	4787195	439276
GSH775	Non-Participating	4787160	439287
GSH776	Non-Participating	4787163	439316
GSH777	Non-Participating	4787170	439343
GSH778	Non-Participating	4787178	439366
GSH779	Non-Participating	4787815	439671
GSH78	Non-Participating	4789928	436577
GSH780	Non-Participating	4787796	439659
GSH781	Non-Participating	4787816	439704
GSH782	Non-Participating	4787786	439723
GSH783	Non-Participating	4787670	439608
GSH784	Non-Participating	4787697	439779
GSH785	Non-Participating	4787833	440033
GSH786	Non-Participating	4787698	440000
GSH787	Non-Participating	4787705	439942
GSH788	Non-Participating	4787694	440040
GSH789	Non-Participating	4787779	440354
GSH79	Non-Participating	4790044	436959
GSH790	Non-Participating	4787741	440376
GSH791	Non-Participating	4787786	440415
GSH792	Non-Participating	4787826	440700
GSH793	Non-Participating	4787775	440679
GSH794	Non-Participating	4787759	440716
GSH795	Participating	4789798	439537
GSH796	Participating	4789835	439575
GSH797	Participating	4789871	439548
GSH798	Non-Participating	4791090	438943
GSH799	Non-Participating	4791126	438975
GSH80	Non-Participating	4790112	436999
GSH800	Non-Participating	4791090	439001
GSH801	Non-Participating	4791109	439036
GSH802	Non-Participating	4790837	439353
GSH803	Non-Participating	4790850	439378
GSH804	Non-Participating	4791397	439554
GSH805	Non-Participating	4791361	439505
GSH806	Non-Participating	4791320	439535
GSH807	Non-Participating	4791426	439500
GSH808	Non-Participating	4791893	438967
GSH809	Non-Participating	4791876	438955
GSH81	Non-Participating	4790052	437009
GSH810	Non-Participating	4791840	438972
GSH811	Non-Participating	4791841	439014
GSH812	Non-Participating	4791814	438964
GSH813	Non-Participating	4792096	439060
GSH814	Non-Participating	4792133	439071
GSH815	Non-Participating	4792132	439093
GSH816	Non-Participating	4792102	439097
GSH817	Non-Participating	4792080	439117
GSH818	Non-Participating	4792138	439134
GSH819	Non-Participating	4792137	439114
GSH82	Non-Participating	4790173	437059
GSH820	Non-Participating	4792161	439527
GSH821	Non-Participating	4792115	439541
GSH83	Non-Participating	4790318	437095

Receptor ID Number	Receptor Type	Easting	Northing
GSH84	Non-Participating	4790351	437088
GSH847	Non-Participating	4793512	441191
GSH848	Non-Participating	4793475	441190
GSH849	Non-Participating	4793459	441359
GSH85	Non-Participating	4790357	437079
GSH850	Non-Participating	4793449	441458
GSH851	Non-Participating	4793142	441384
GSH852	Non-Participating	4793170	441399
GSH853	Non-Participating	4793128	441415
GSH854	Non-Participating	4793130	441042
GSH855	Non-Participating	4793221	441428
GSH856	Non-Participating	4792981	441415
GSH857	Non-Participating	4793091	441604
GSH858	Non-Participating	4793181	441603
GSH859	Non-Participating	4793306	441677
GSH86	Non-Participating	4790593	437199
GSH860	Non-Participating	4793652	441647
GSH861	Non-Participating	4793585	441655
GSH862	Non-Participating	4793563	441673
GSH863	Non-Participating	4793559	441693
GSH864	Non-Participating	4793548	441678
GSH865	Non-Participating	4792734	440955
GSH866	Non-Participating	4792751	440984
GSH867	Non-Participating	4792785	441470
GSH868	Non-Participating	4792764	441447
GSH869	Non-Participating	4792687	441446
GSH87	Non-Participating	4790664	437216
GSH870	Non-Participating	4792623	441241
GSH871	Non-Participating	4792345	441292
GSH872	Non-Participating	4792361	441314
GSH873	Non-Participating	4792357	441388
GSH874	Non-Participating	4792035	441208
GSH875	Non-Participating	4792060	441184
GSH876	Non-Participating	4791847	441114
GSH877	Non-Participating	4791813	441077
GSH878	Non-Participating	4791860	441144
GSH879	Non-Participating	4791860	441161
GSH88	Non-Participating	4790656	437402
GSH880	Participating	4791958	441343
GSH881	Participating	4791969	441388
GSH882	Participating	4791978	441417
GSH883	Non-Participating	4791605	441158
GSH884	Non-Participating	4791567	441172
GSH885	Non-Participating	4791607	441225
GSH886	Participating	4791469	441552
GSH887	Participating	4791417	441480
GSH888	Participating	4791444	441465
GSH889	Non-Participating	4790698	441229
GSH89	Non-Participating	4790674	437194
GSH890	Non-Participating	4790705	441332
GSH891	Participating	4790753	441507
GSH892	Participating	4790763	441535
GSH893	Participating	4790753	441566
GSH894	Non-Participating	4790553	441430
GSH895	Non-Participating	4790518	441394
GSH896	Non-Participating	4790457	441587
GSH897	Non-Participating	4790476	441620
GSH898	Non-Participating	4790069	441597
GSH899	Non-Participating	4790066	441634
GSH90	Non-Participating	4790999	437275
GSH900	Non-Participating	4789804	441483
GSH901	Non-Participating	4789783	441408

Receptor ID Number	Receptor Type	Easting	Northing
GSH902	Non-Participating	4789427	441401
GSH903	Non-Participating	4789474	441416
GSH904	Non-Participating	4789473	441473
GSH905	Non-Participating	4789437	441447
GSH906	Non-Participating	4789566	441663
GSH907	Non-Participating	4789584	441686
GSH908	Non-Participating	4789588	441697
GSH909	Non-Participating	4789334	441705
GSH91	Non-Participating	4791206	437481
GSH910	Non-Participating	4789333	441734
GSH911	Non-Participating	4789162	441754
GSH912	Non-Participating	4789191	441784
GSH913	Non-Participating	4789163	441806
GSH914	Non-Participating	4789183	441824
GSH915	Non-Participating	4789017	441259
GSH916	Non-Participating	4788971	441265
GSH917	Non-Participating	4789013	441301
GSH918	Non-Participating	4788992	441334
GSH919	Non-Participating	4788976	441887
GSH92	Non-Participating	4791235	437475
GSH920	Non-Participating	4788983	441861
GSH921	Non-Participating	4788028	441030
GSH922	Non-Participating	4787987	441043
GSH923	Non-Participating	4787856	441069
GSH924	Non-Participating	4787995	441106
GSH925	Non-Participating	4787604	441082
GSH926	Non-Participating	4787653	441086
GSH927	Non-Participating	4787681	441078
GSH935	Non-Participating	4788464	441577
GSH936	Non-Participating	4788459	441612
GSH937	Non-Participating	4788441	441825
GSH938	Non-Participating	4788418	441849
GSH939	Non-Participating	4788393	441848

Note: All co-ordinates are provided in NAD 83 Zone 17

Appendix C

Parcel Boundary Setback Reduction Analysis



NextEra Energy Canada, ULC

GOSHEN WIND ENERGY CENTRE - PARCEL BOUNDARY SETBACK REDUCTION ANALYSIS

JUSTIFICATION REPORT

AUGUST 2012



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1. INTRODUCTION

1.1 Purpose

The purpose of this report is to provide an assessment of proposed wind turbine locations within the Goshen Wind Energy Centre that do not meet the required setback of “turbine height minus blades” from the base of the wind turbine to the boundary of parcels of land on which the turbine is located.

IBI Group was retained by NextEra Energy Canada, ULC to undertake an analysis of Sixteen (16) turbines within the Goshen Wind Energy Centre. The analysis will look at what impacts the reduced setback may have on nearby business, infrastructure, properties or land use activities, and will describe any required preventative measures to be used to address any adverse impacts.

From an agricultural planning perspective, it is generally considered advantageous to farmers to have turbines located as close as possible to lot lines (or fence lines located between fields), in order to cause the least amount of disruption to farming practices, in particular field crop planting and harvesting. This coincides with traditional locations for farm access roads along fence lines, which in turn are preferred locations for new or improved turbine access roads.

1.2 Legislation

Ontario Regulation 359/09 outlines the regulations for the development and approval of renewable energy projects within the Province of Ontario. Section 53 of the regulation outlines setback requirements for Class 3, 4, and 5 wind facilities, with the Goshen Wind Energy Centre being a Class 4 wind facility. It states in subsection 53 (1) (b) that no person shall erect a Class 4 wind facility unless:

the distance between the base of the wind turbine and all boundaries of the parcel of land on which the wind turbine is constructed, installed or expanded is equivalent to, at a minimum, the height of the wind turbine, excluding the length of any blades.

And furthermore under subsection 53 (3), states that clause 53 (1) (b) does not apply if the distance from the base of the turbine to the property boundary is at least blade length plus 10 metres and:

as part of an application for the issue of a renewable energy approval or a certificate of approval in respect of the construction, installation or expansion of the wind turbine, the person who is constructing, installing or expanding the wind turbine submits a written assessment,

(i) demonstrating that the proposed location of the wind turbine will not result in adverse impacts on nearby business, infrastructure, properties or land use activities, and

(ii) describing any preventative measures that are required to be implemented to address the possibility of any adverse impacts mentioned in subclause (i).

This report is intended to fulfill the above requirements of subsection 53 (3) of Ontario Regulation 359/09.

1.3 Project Description

The proposed Goshen Wind Energy centre is located in south-western Ontario, in the Municipality of Bluewater and Municipality of South Huron, of Huron County, Ontario. More specifically, the area being studied for the wind farm components is located generally east of Klondyke Road, south of Rogerville Road, west of Parr Line and north of Mount Carmel Drive. Project components will be installed on privately-owned agricultural lots within this area. It is anticipated that the Project's collection system may be partially located on public Rights of Way.

The wind turbine technology proposed for the Project is the GE 1.6-100 Wind Turbine and the GE 1.56-100 Wind Turbine. With a total nameplate capacity of 102 MW, the Project is categorized as a Class 4 facility. Although NextEra is seeking a Renewable Energy Approval (REA) for up to 72 wind turbines, only 63 will be constructed for the Project. These turbines have a hub height of 80 metres, with a blade length of 50 metres. Based on this turbine model the absolute minimum setback from a property boundary would be 60 metres (blade length + 10 metres). However, in the event that the turbines are sited closer than 60 metres, an agreement is required which would allow for a setback less than 60 metres (blade length + 10 metres).

For this project there are Sixteen (16) turbines which require justification for the reduced property boundary setback.

TURBINE NO.	Host Land Parcel		Turbine Distance from Lot Line (metres)	Direction of Neighbouring Land Parcel from Turbine	Neighbouring Land Parcel		Notes
	Lot	Concession			Lot	Concession	
4	Pt Lot 13	12	76	north	Pt Lot 14	10	Assessment Conducted
8	Pt Lot 11	13	73.4	north	Lot 11 & 12, Pt Lot 11	14, 13	Assessment Conducted
17	Pt Lot 11	18	79.3	north	Pt 11	18	Assessment Conducted
21	15, Pt Lot 15	16	62.7	south	13	16	Assessment Conducted
35	17	8	73.2	east	18	7	Assessment Conducted
37	8	16	17.9	south	7 & W1/2 Lot 6	16	Assessment Conducted /Agreement will be in place as per Section 52(2) (b)
38	E1/2 Lot 6	16	64	west	7 & W1/2 Lot 6	16	Assessment Conducted
41	7	13	37.6	south	E1/2 Lot 6, 6	14, 13	Assessment Conducted /Agreement will be in place as per Section 52(2) (b)
46	3	10	64	south	Pt Lot 18	S Boundary	Assessment Conducted
49	Pt Lot 8	8	78.8	south	Pt Lot 7	8	Assessment Conducted
53	N1/2 Lot 7	20	65.4	south	Pt 6	20	Assessment Conducted
56	Pt Lot 16	22	22.9	south	Pt Lot 16, Pt Lot 17 & Pt Lot 22	22, 22 & S Boundary	Assessment Conducted /Agreement will be in place as per Section 52(2) (b)
65	23 & Pt Lot 13	7, 7	75.7	south	Pt Lot 22	7	Assessment Conducted
69	6 & 7	11	53.7	west	6 & Pt Lot 7	12	Assessment Conducted /Agreement will be in place as per Section 52(2) (b)
71	Pt Lot 15	10	46.6	south	Pt Lot 14 & Pt Lot 15	12	Assessment Conducted /Agreement will be in place as per Section 52(2) (b)
84	12	River Aux Sauble	70	north	S1/2 Lot 11	River Aux Sauble	Assessment Conducted

2. ANALYSIS

The methodology for this report was to identify turbines that were less than 80 metres from a lot line; undertake an analysis of the local surrounding land use characteristics; determine the potential impacts of the wind turbine on the surrounding land uses; and discuss what if any preventative measures should be employed to mitigate such impacts.

2.1 Turbine 4 – Part Lot 13, Con 10

2.1.1 DESCRIPTION

Turbine 4 is located 76.0 metres from the closest lot line (north side lot line) which is 4.0 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are almost entirely used for field crop purposes with no buildings, structures, or infrastructure located on the lands. A small tributary is located approximately 300 metres northwest of the turbine, while a small woodlot lot is located approximately 400 metres northeast of the turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 4 Map in Appendix 1).

2.1.2 POTENTIAL IMPACTS

Impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not changed by a reduction of 4.0 metres. There is no adverse impact on nearby properties or land use activities.

2.1.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include design certification of the wind turbine by professional engineers; regular maintenance and ongoing monitoring of the wind turbine by operations staff; and turbine shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.2 Turbine 8 – Pt Lot 11, Con 13

2.2.1 DESCRIPTION

Turbine 4 is located 73.4 metres from the closest lot line (north side lot line) which is 6.6 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are almost entirely used for field crop purposes with no buildings, structures, or infrastructure located on the lands. A small tributary is located approximately 300 metres northwest of the

turbine, while a small woodlot lot is located approximately 250 metres northeast of the turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 8 Map in Appendix 1).

2.2.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 6.6 metres. There is no adverse impact on nearby properties or land use activities.

2.2.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.3 Turbine 17 –Part Lot 11, Con 18

2.3.1 DESCRIPTION

Turbine 17 is located 79.3 metres from the closest lot line (north side lot line) which is 0.7 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are characterized almost entirely as woodlot with a small area used for cultivating crops. Land use within the vicinity of the proposed turbine would be limited to the area used seasonally for cultivating crops (See Turbine 17 Map in Appendix 1).

2.3.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel to the north from the reduced setback may include damage to trees and/or crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 0.7 metres. There is no adverse impact on nearby properties or land use activities.

2.3.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring trees and crops, and reduce risk to human safety include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of

these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.4 Turbine 21 – Lot 14 & Pt Lot 15, Con 16

2.4.1 DESCRIPTION

Turbine 21 is located 62.7 metres from the closest lot line (south side lot line) which is 17.3 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are characterized almost entirely as cultivatable field with a small area woodlot located approximately 250 metres southeast of the turbine. A farm dwelling and farm related buildings are located approximately 600 metres southwest of the turbine. Land use within the vicinity of the proposed turbine would be limited to the area used seasonally for cultivating crops (See Turbine 21 Map in Appendix 1).

2.4.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel to the north from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 17.3 metres. There is no adverse impact on nearby properties or land use activities.

2.4.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops, and reduce risk to human safety include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.5 Turbine 35 – Lot 17, Con 8

2.5.1 DESCRIPTION

Turbine 35 is located 73.2 metres from the closest lot line (easterly rear lot line) which exceeds the absolute minimum requirement of blade length plus 10 metres (60 metres) and is only 6.8 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are characterized as almost entirely cultivable farm fields. A small woodlot is located approximately 100 metres from the turbine. The closest farm dwelling or building is located approximately 800 metres to the east. Land use within the vicinity of the proposed turbine would be limited to the area used seasonally for cultivating crops (See Turbine 35 Map in Appendix 1).

2.5.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to trees and/or crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 6.8 metres. There is no adverse impact on nearby properties or land use activities.

2.5.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring trees and crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.6 Turbine 37 – Lot 8, Con 16

2.6.1 DESCRIPTION

This turbine is located 17.9 metres from the closest lot line (southerly side lot line) which exceeds the absolute minimum requirement of blade length plus 10 metres (60 metres) and is 62.1 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are characterized as mostly cultivatable fields with a small woodlot located approximately 100 metres east of the turbine. In addition, the closest building is located over 700 metres to the southwest. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 37 Map in Appendix 1). Despite requiring an agreement for a reduced setback, further analysis is also required.

2.6.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops and/or trees as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 62.1 metres. There is no adverse impact on nearby properties or land use activities.

2.6.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.7 Turbine 38 – E 1/2 Lot 6, Con 16

2.7.1 DESCRIPTION

This turbine is located 64 metres from the closest lot line (westerly rear lot line) which is 16 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are characterized as mostly cultivatable fields with a small woodlot located approximately 350 metres east of the turbine. In addition, the closest building is located over 500 metres to the northwest. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 38 Map in Appendix 1).

2.7.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 16 metres. There is no adverse impact on nearby properties or land use activities.

2.7.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops and/or trees include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.8 Turbine 41 – Lot 7, Con 13

2.8.1 DESCRIPTION

This turbine is located 37.6 metres from the closest lot line (southerly side lot line) which is 42.4 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are characterized as mostly cultivatable fields with a small woodlot located approximately 450 metres west of the turbine. In addition, the closest building is located over 750 metres to the southeast. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 41 Map in Appendix 1). Despite requiring an agreement for a reduced setback, further analysis is also required.

2.8.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops and/or trees as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 42.4 metres. There is no adverse impact on nearby properties or land use activities.

2.8.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.9 Turbine 46 – Part Lot 3, Con 10

2.9.1 DESCRIPTION

This turbine is located 64 metres from the closest lot line (southerly side lot line) which is 16 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes with buildings located greater than 700 metres south of the proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 46 Map in Appendix 1).

2.9.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 16 metres. There is no adverse impact on nearby properties or land use activities.

2.9.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.10 Turbine 49 – Part Lot 8, Con 8

2.10.1 DESCRIPTION

This turbine is located 78.8 metres from the closest lot line (southerly side lot line) which is 1.2 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes with buildings located greater than 1000 metres west of the proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 49 Map in Appendix 1).

2.10.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 1.2 metres. There is no adverse impact on nearby properties or land use activities.

2.10.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.11 Turbine 53 – N ½ Lot 7, Con 20

2.11.1 DESCRIPTION

This turbine is located 65.4 metres from the closest lot line (southerly side lot line) which is 14.6 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes with buildings located greater than 600 metres of the proposed turbine. A woodlot is located greater than 100 metres east of the proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 53 Map in Appendix 1).

2.11.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops and/or trees as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 14.6 metres. There is no adverse impact on nearby properties or land use activities.

2.11.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops and trees include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.12 Turbine 56 – Part Lot 16, Con 22

2.12.1 DESCRIPTION

This turbine is located 22.9 metres from the closest lot lines (southerly side lot lines) which is 57.1 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes with buildings located greater than a kilometre south of the proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 56 Map in Appendix 1). Despite requiring an agreement for a reduced setback, further analysis is also required.

2.12.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 57.1 metres. There is no adverse impact on nearby properties or land use activities.

2.12.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.13 Turbine 65 – Lot 23, Con 7; Part Lot 22, Con 7

2.13.1 DESCRIPTION

This turbine is located 75.7 metres from the closest lot line (southerly side lot line) which is 4.3 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes. Buildings are located greater than 500 metres southeast of the

proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 65 Map in Appendix 1).

2.13.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 4.3 metres. There is no adverse impact on nearby properties or land use activities.

2.13.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.14 Turbine 69 – Lot 6 & 7, Con 11

2.14.1 DESCRIPTION

Turbine 69 is located 53.7 metres from the closest lot line (westerly rear lot line) which is 26.3 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes with buildings located greater than a kilometre west of the proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 69 Map in Appendix 1). Despite requiring an agreement for a reduced setback, further analysis is also required.

2.14.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 26.3 metres. There is no adverse impact on nearby properties or land use activities.

2.14.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather

instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.15 Turbine 71 – Part Lot 15, Con 10

2.15.1 DESCRIPTION

Turbine 71 is located 46.6 metres from the closest lot line (southerly side lot line) which is less than the minimum requirement of blade length plus 10 metres (60 metres) and is 33.3 metres less than required as the standard setback without undertaking any further analysis. The adjacent lands are used for field crop purposes with buildings and structures located to the southeast at an approximate distance of 700 metres. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 71 Map in Appendix 1). Despite requiring an agreement for a reduced setback, further analysis is also required.

2.15.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 33.3 metres. There is no adverse impact on nearby properties or land use activities.

2.15.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

2.16 Turbine 84 – Lot 12, Con River Aux Sauble

2.16.1 DESCRIPTION

This turbine is located 70 metres from the closest lot line (northerly side lot line) which is 10 metres less than required as the standard setback without undertaking any further analysis. The land is used for field crop purposes with buildings located greater than 700 metres north of the proposed turbine. Land use within the vicinity of the proposed turbine would be restricted to seasonal farming activities with otherwise minimal human activities (See Turbine 84 Map in Appendix 1).

2.16.2 POTENTIAL IMPACTS

Adverse impacts to the neighbouring parcel from the reduced setback may include damage to crops as a result of turbine failure. However, this impact is already present at an 80 metre setback and is not enhanced significantly by requesting a reduction of 10 metres. There is no adverse impact on nearby properties or land use activities.

2.16.3 PREVENTATIVE MEASURES

Preventative measures to address potential damage to neighbouring crops include certification of the wind turbine by professional engineers; ongoing regular maintenance and monitoring of the wind turbine by operations staff; and shutdown mechanisms and protocols in extreme weather instances to prevent damage to wind turbines. All of these measures are standard best practices and no additional preventative measures are required for the change in setback.

3. CONCLUSION

Based on the preceding analysis of the proposed sixteen (16) turbine locations considered for reduced setbacks from property boundaries, it is our opinion that there would be no adverse impacts as a result of the setback reductions, and that standard preventative measures implemented through best practices address any change in impacts that may be encountered.

Appendix 1 – Individual Map Schedules

Goshen Wind Energy Centre

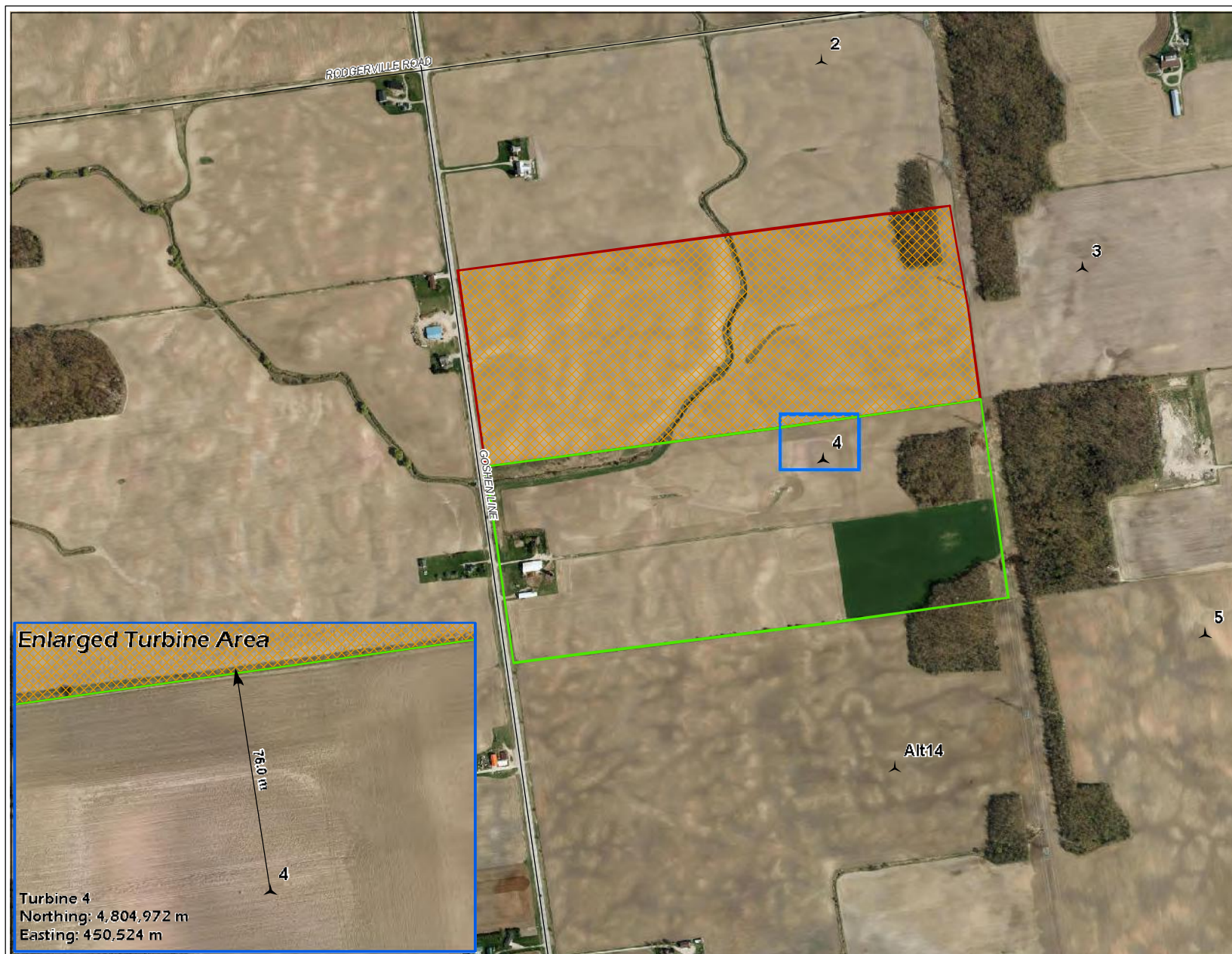
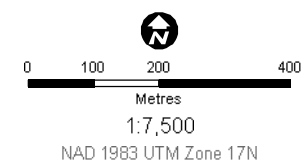
Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

Legend

-  Turbine Location
-  Host Land Parcel
Pt Lot 13, Con 10
-  Neighbouring Land Parcel
Pt Lot 14, Con 10
-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 4



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

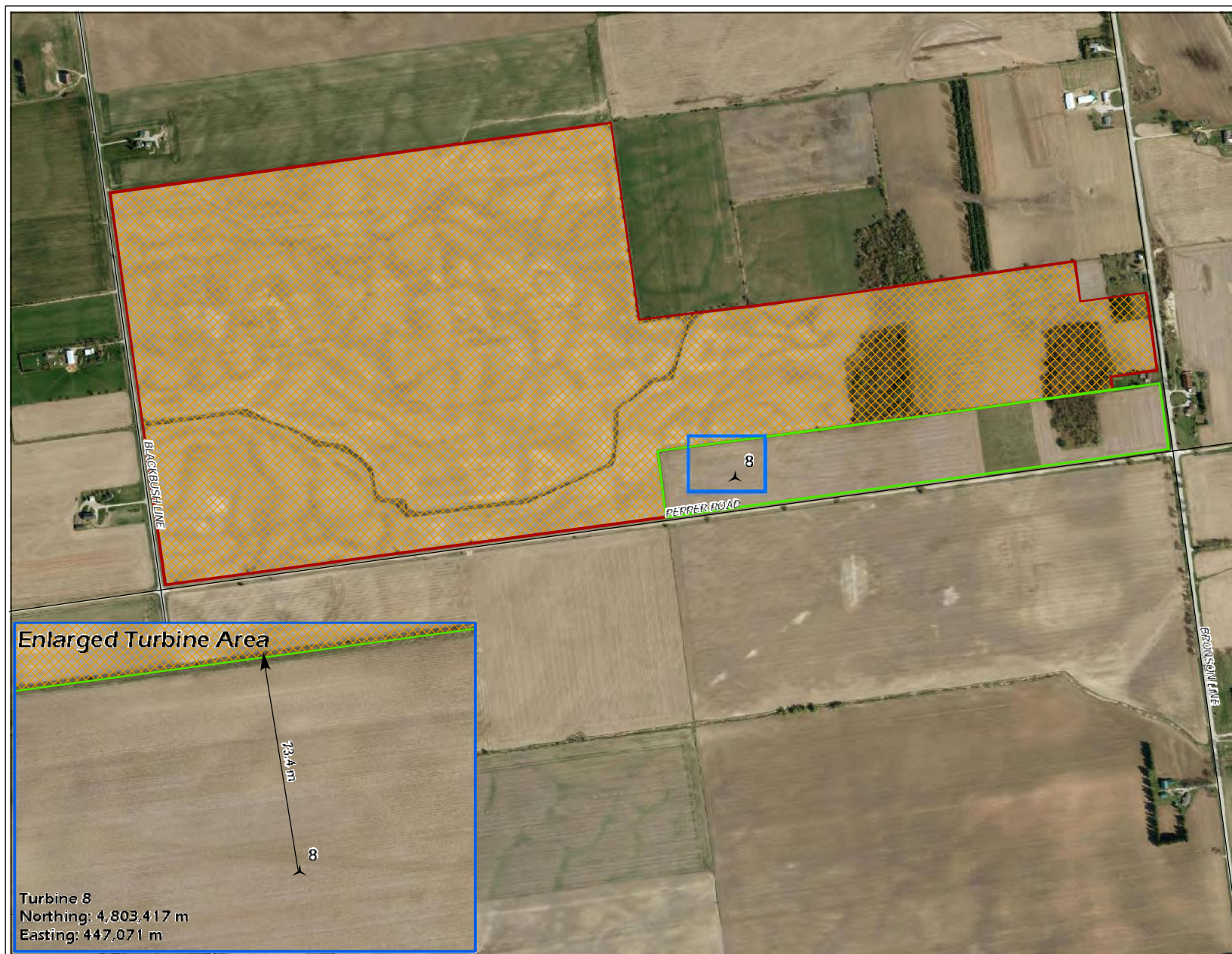
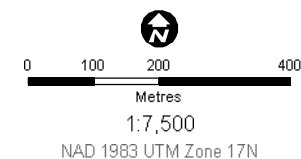
Legend

-  Turbine Location
-  Host Land Parcel
Pt Lot 11, Con 13
-  Neighbouring Land Parcel
Lot 11 & 12, Con 14, Pt Lot 11,
Con 13

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 8



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

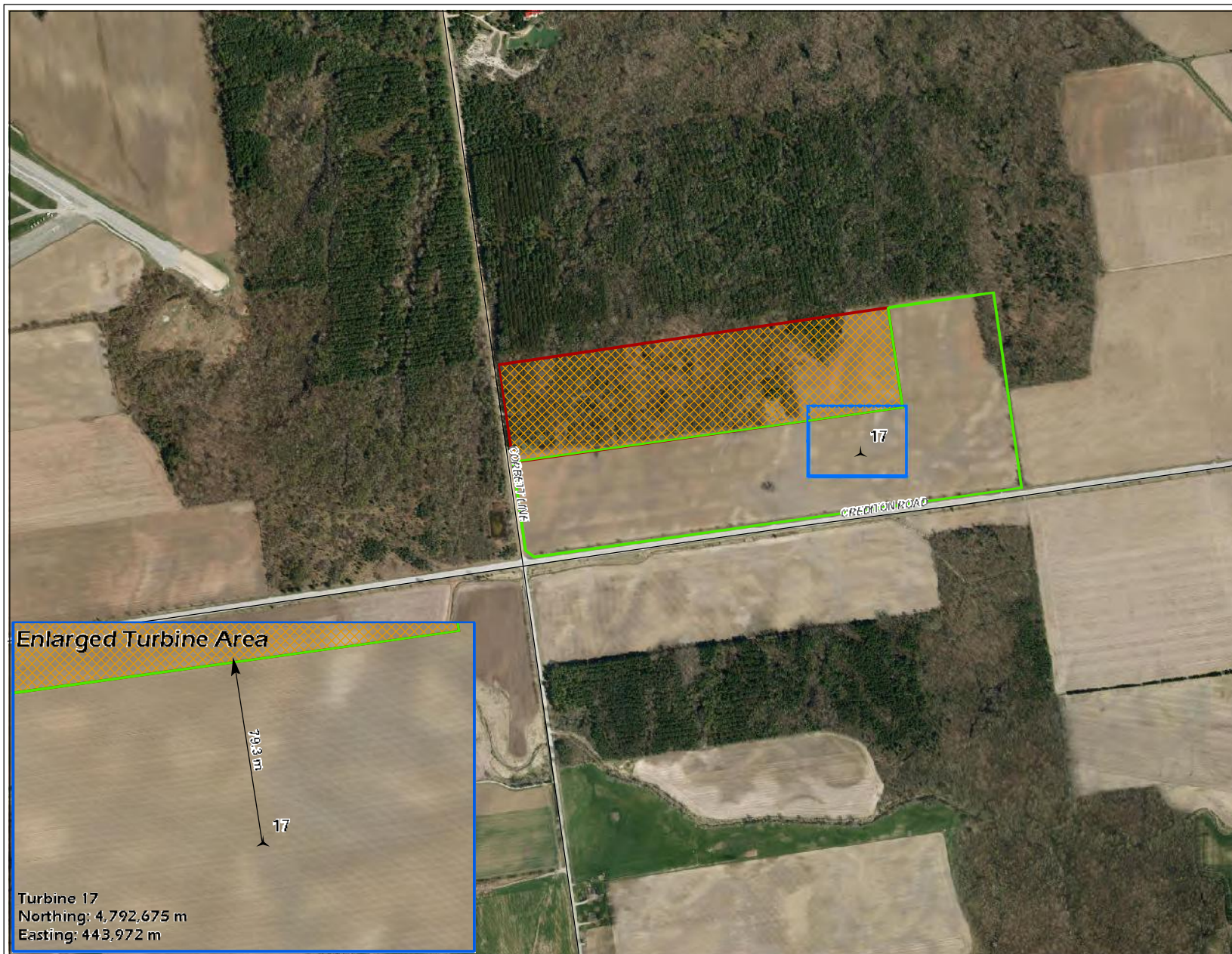
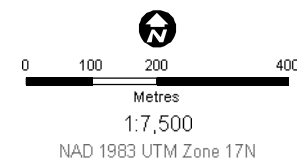
Legend

-  Turbine Location
-  Host Land Parcel
Pt Lot 11, Con 18
-  Neighbouring Land Parcel
Pt Lot 11, Con 18

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 17





Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

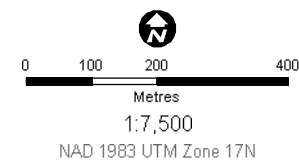
Legend

- Turbine Location
- Host Land Parcel
Lot 14 & Pt Lot 15, Con 16
- Neighbouring Land Parcel
Lot 13, Con 16

Required Lotline Setback

- Agreement Will Be in Place
With Assessment - No Setback
Required
- No Agreement - 60m Setback
With Assessment

Turbine 21



Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

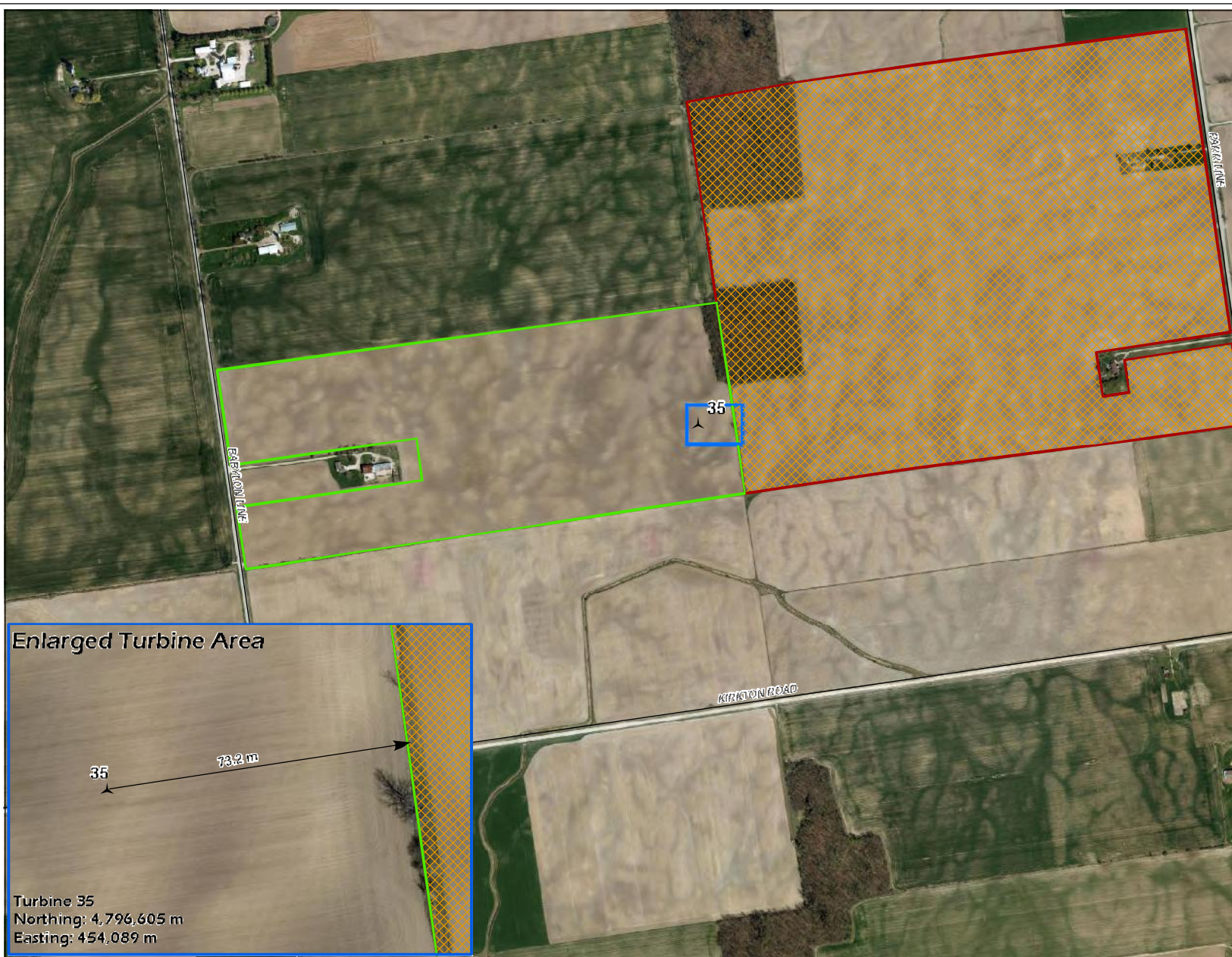
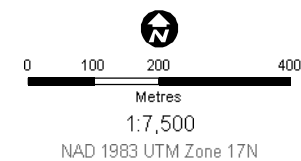
Legend

-  Turbine Location
-  Host Land Parcel
Lot 17, Con 8
-  Neighbouring Land Parcel
Lot 18, Con 7

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 35



Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

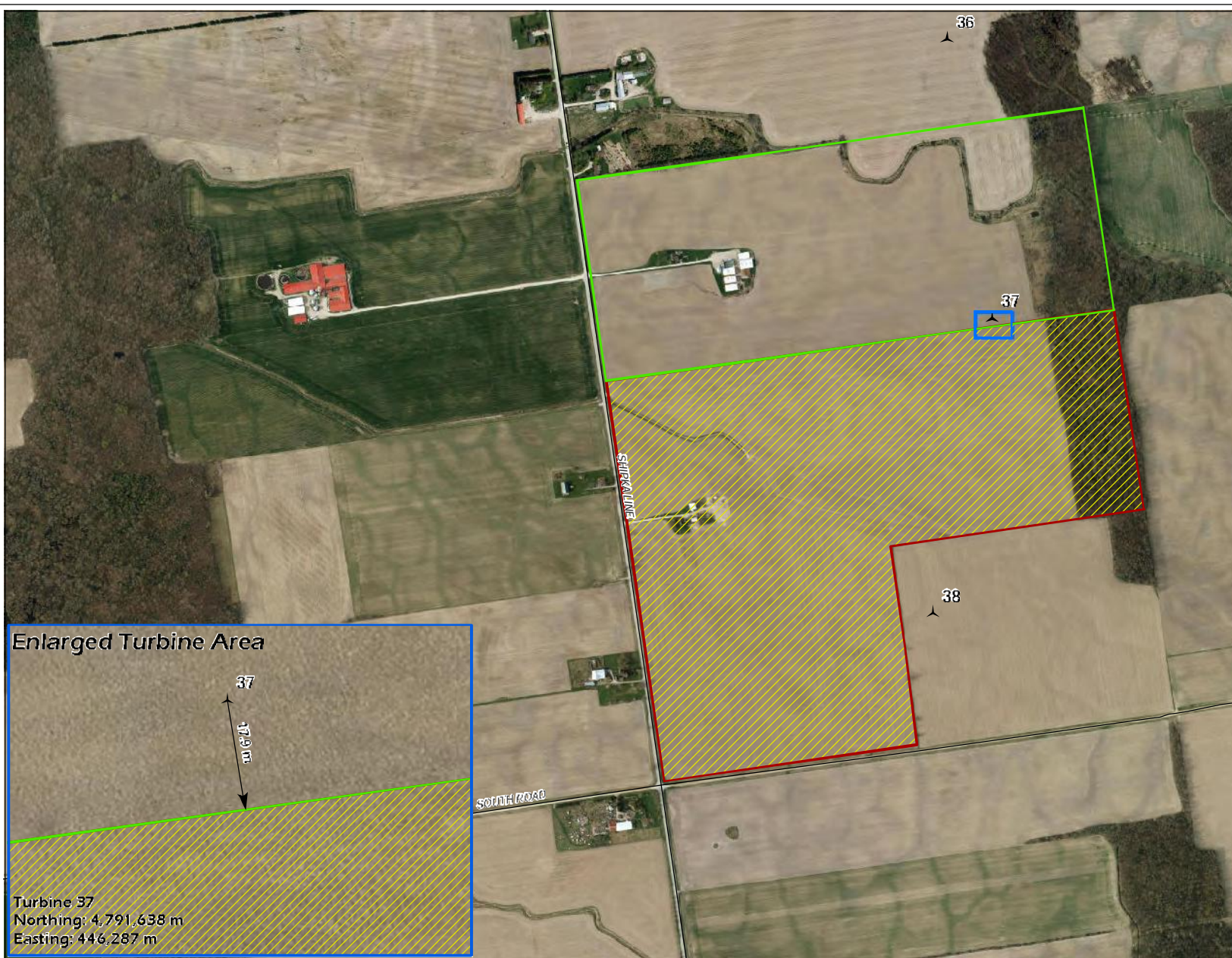
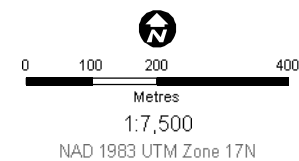
Legend

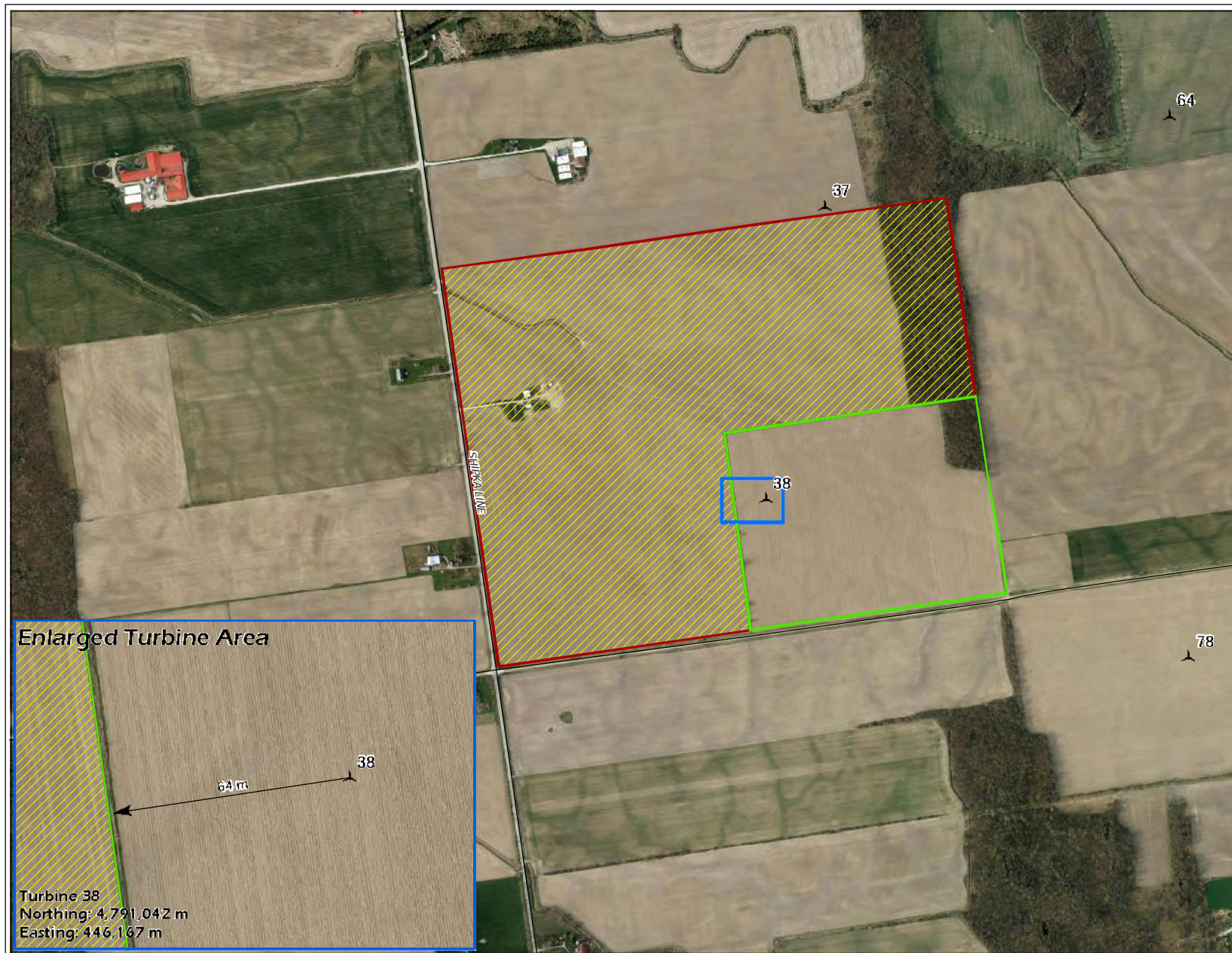
-  Turbine Location
-  Host Land Parcel
Lot 8, Con 16
-  Neighbouring Land Parcel
Lot 7 & W 1/2 of Lot 6, Con 16

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 37





Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

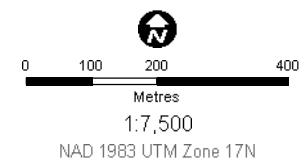
Legend

-  Turbine Location
-  Host Land Parcel
E 1/2 Lot 6 , Con 16
-  Neighbouring Land Parcel
Lot 7 & W 1/2 of Lot 6 , Con 16

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 38



Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

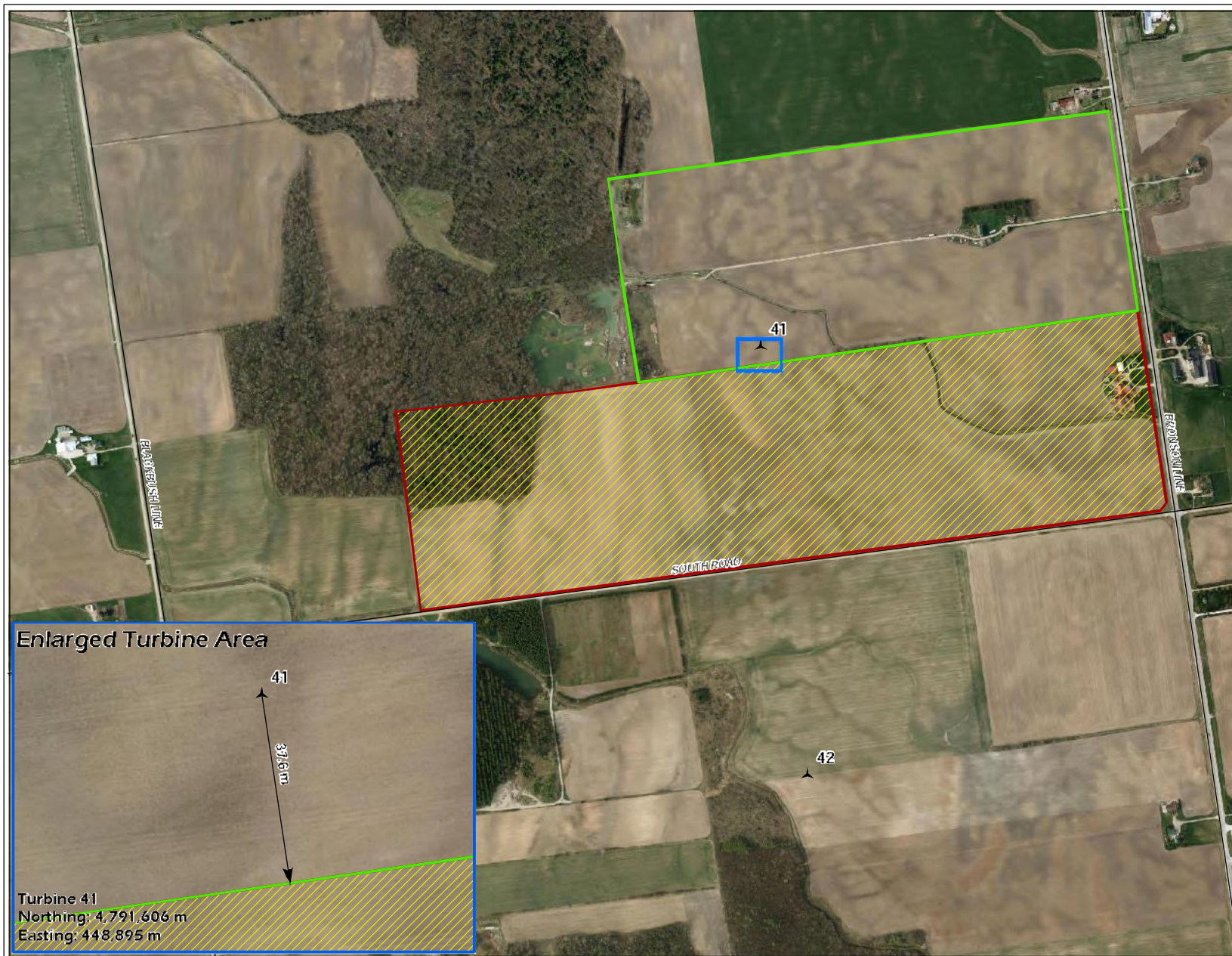
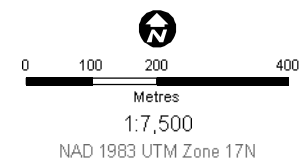
Legend

-  Turbine Location
-  Host Land Parcel
Lot 7, Con 13
-  Neighbouring Land Parcel
E 1/2 of Lot 6, Con 14; Lot 6,
Con 13

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 41



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

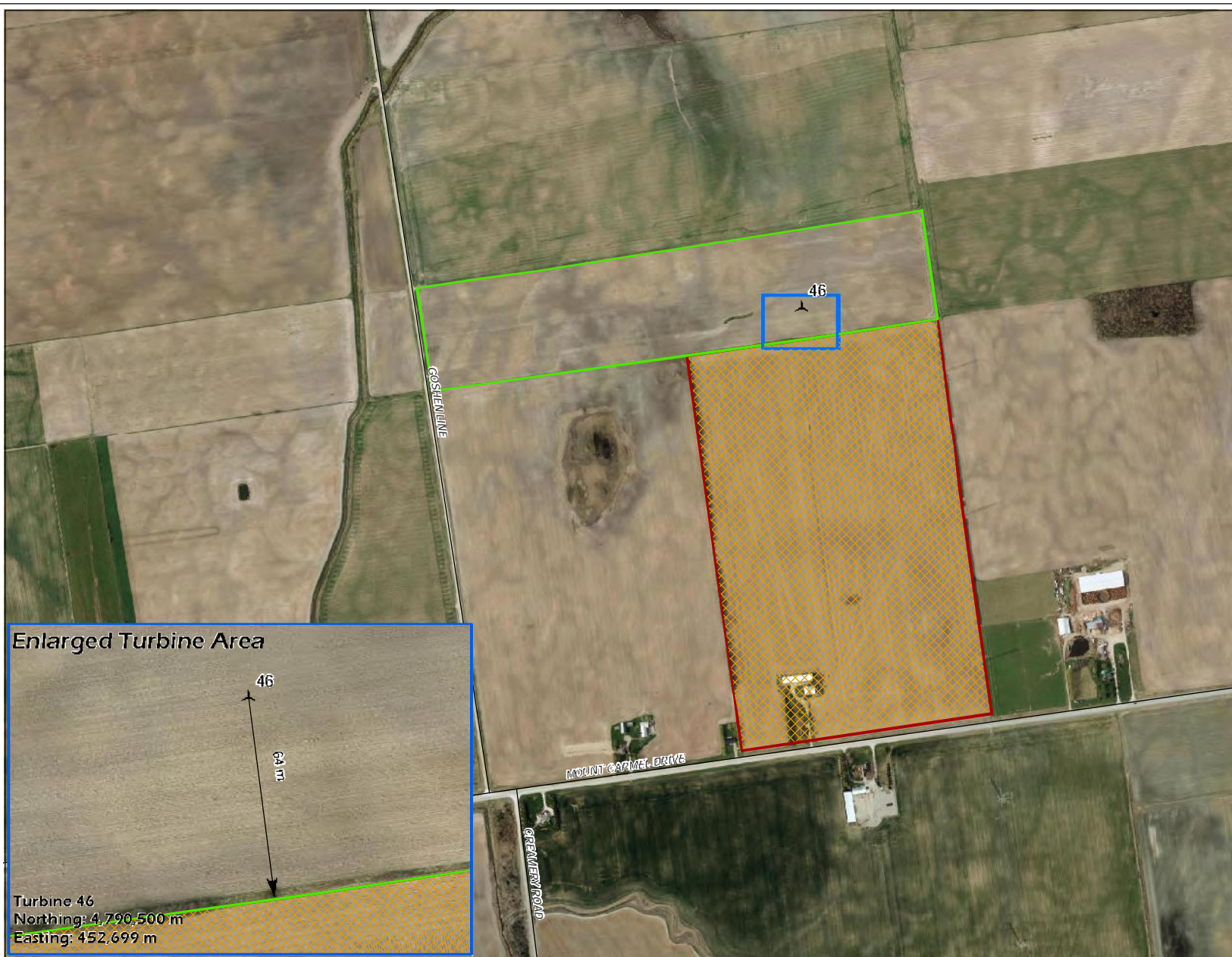
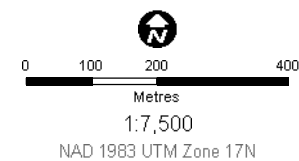
Legend

-  Turbine Location
-  Host Land Parcel
Pt Lot 3, Con 10
-  Neighbouring Land Parcel
Pt Lot 18, Con S Boundary

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 46



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

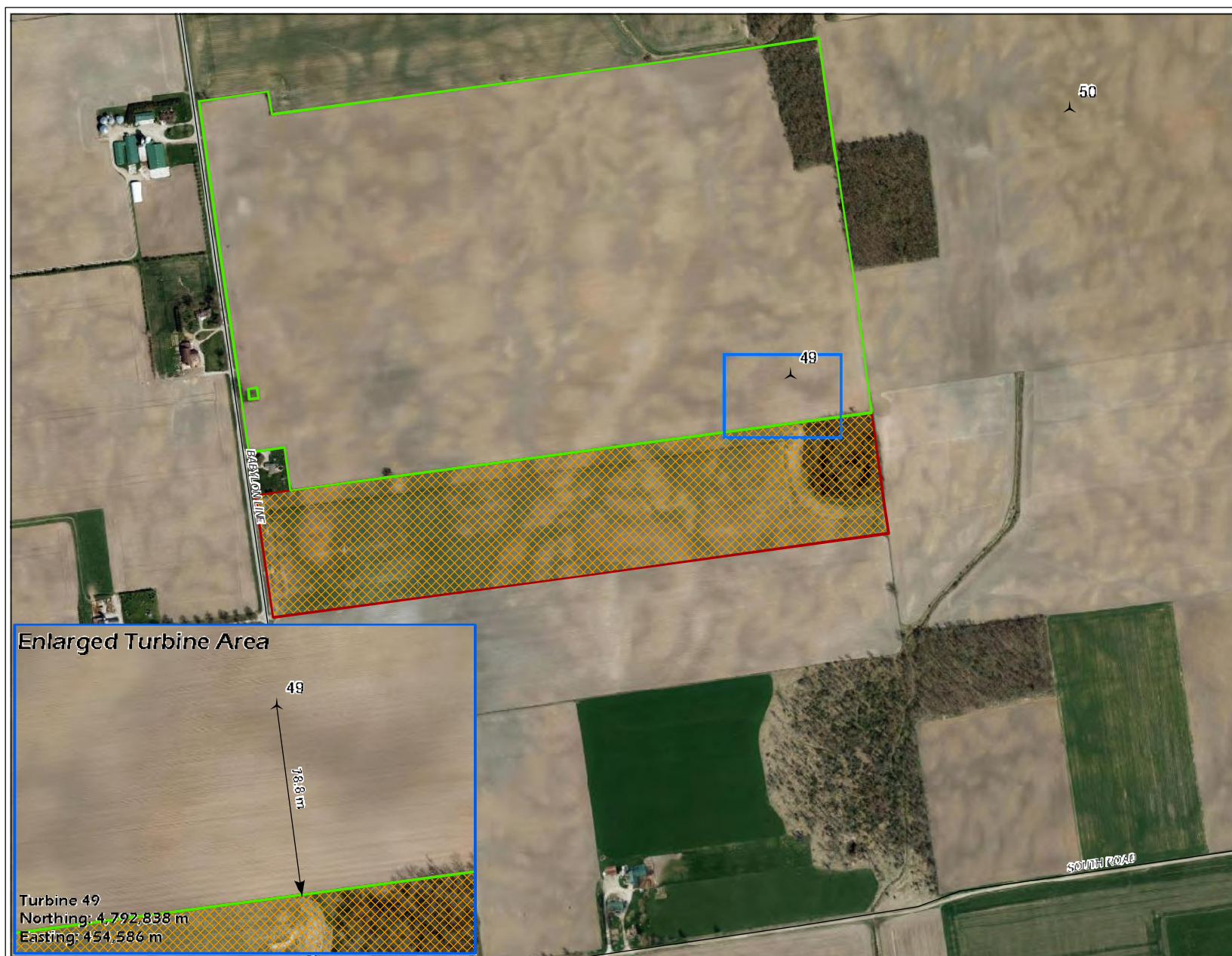
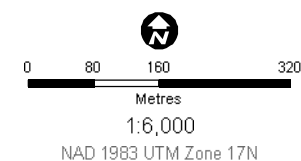
Legend

-  Turbine Location
-  Host Land Parcel
Pt Lot 8, Con 8
-  Neighbouring Land Parcel
Pt Lot 7, Con 8

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 49



Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

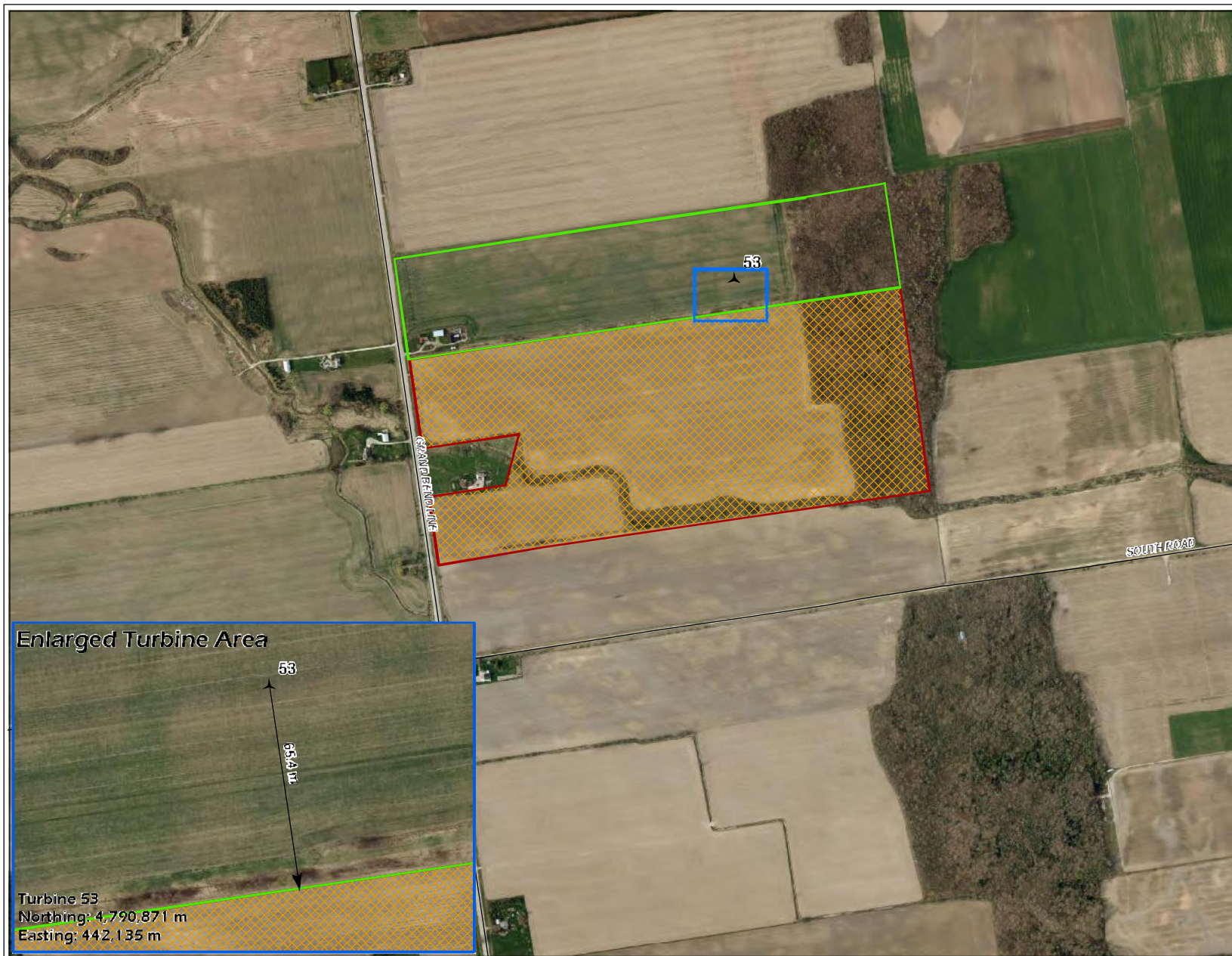
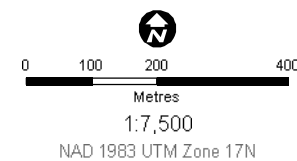
Legend

-  Turbine Location
-  Host Land Parcel
N 1/2 Lot 7, Con 20
-  Neighbouring Land Parcel
Pt Lot 6, Con 20

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 53



Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

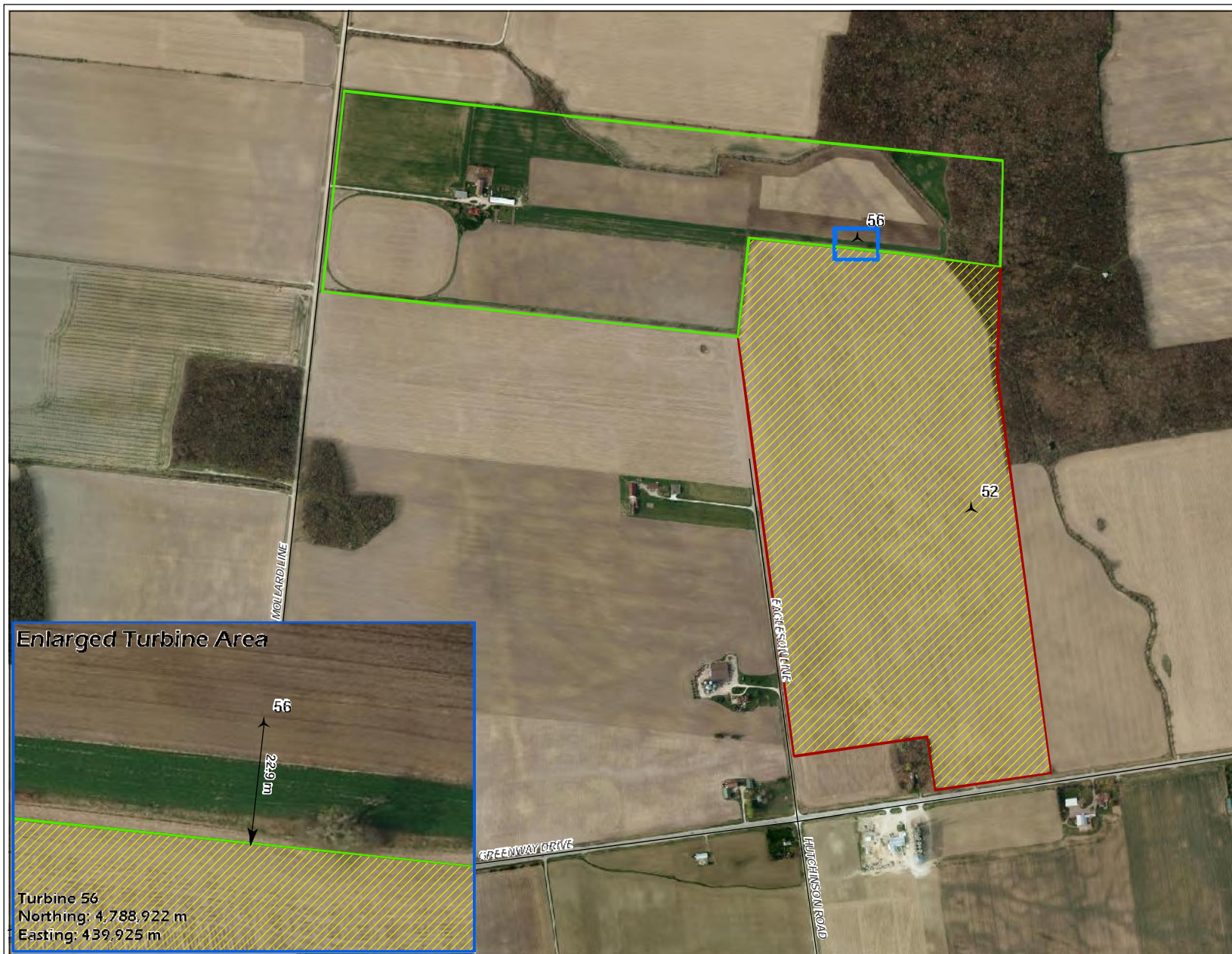
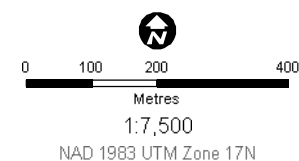
Legend

-  Turbine Location
-  Host Land Parcel
Pt Lot 16, Con 22
-  Neighbouring Land Parcel
Pt Lot 16, Con 22; Pt Lot 17,
Con 22; Pt Lot 43, Con S Bdry

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 56



Goshen Wind Energy Centre

Huron County, Ontario

Parcel Boundary Setback Reduction Analysis

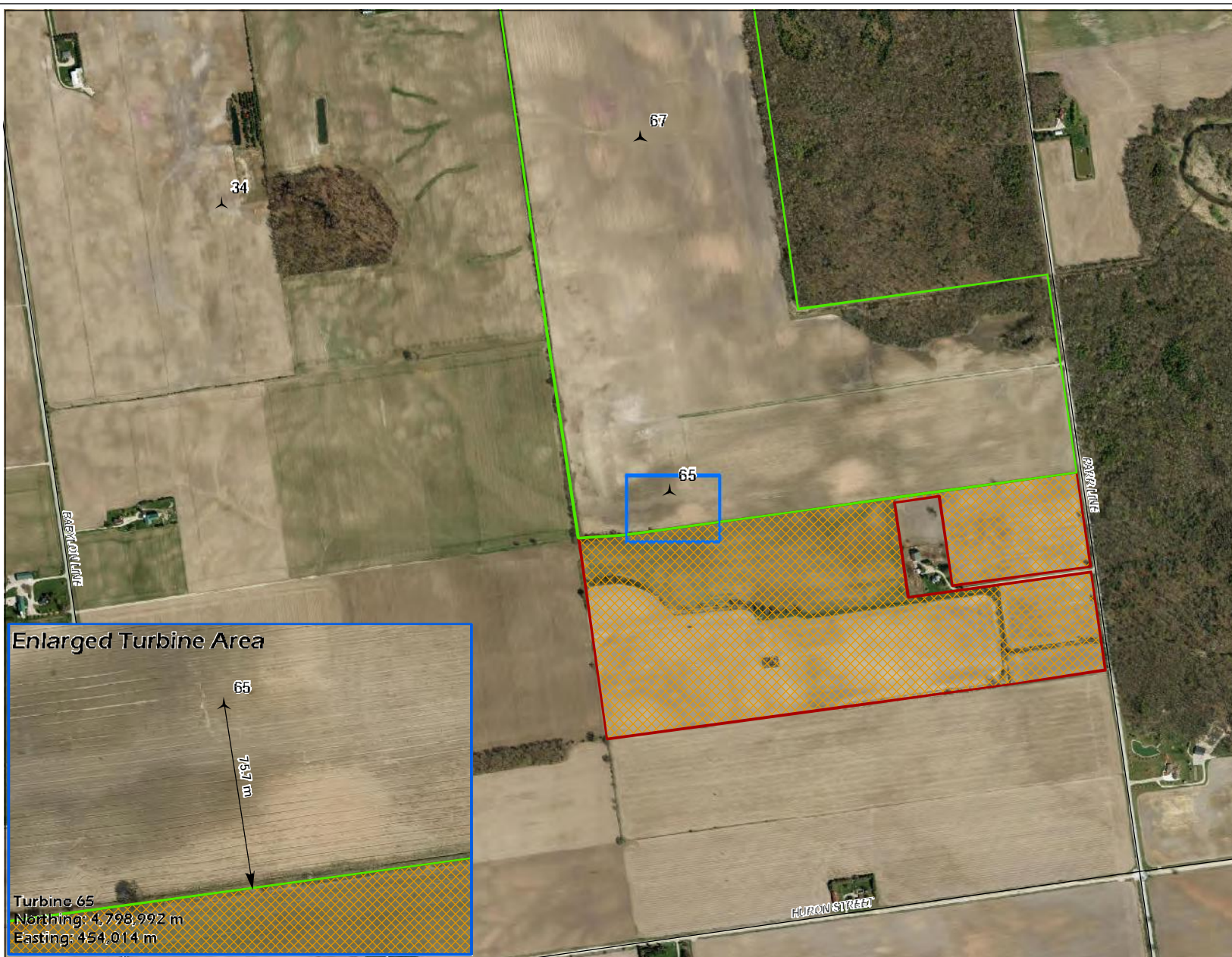
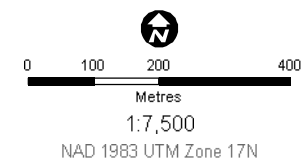
Legend

-  Turbine Location
-  Host Land Parcel
Lot 23, Con 7; Pt Lot 13,
Con N Bdry
-  Neighbouring Land Parcel
Pt Lot 22, Con 7

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 65



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

Legend

▲ Turbine Location

Host Land Parcel
Lot 6 & 7, Con 11

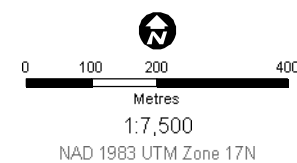
Neighbouring Land Parcel
Lot 6 & Pt Lot 7, Con 12

Required Lotline Setback

Agreement Will Be in Place
With Assessment - No Setback
Required

No Agreement - 60m Setback
With Assessment

Turbine 69



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

Legend

▲ Turbine Location

Host Land Parcel
Pt Lot 15, Con 10

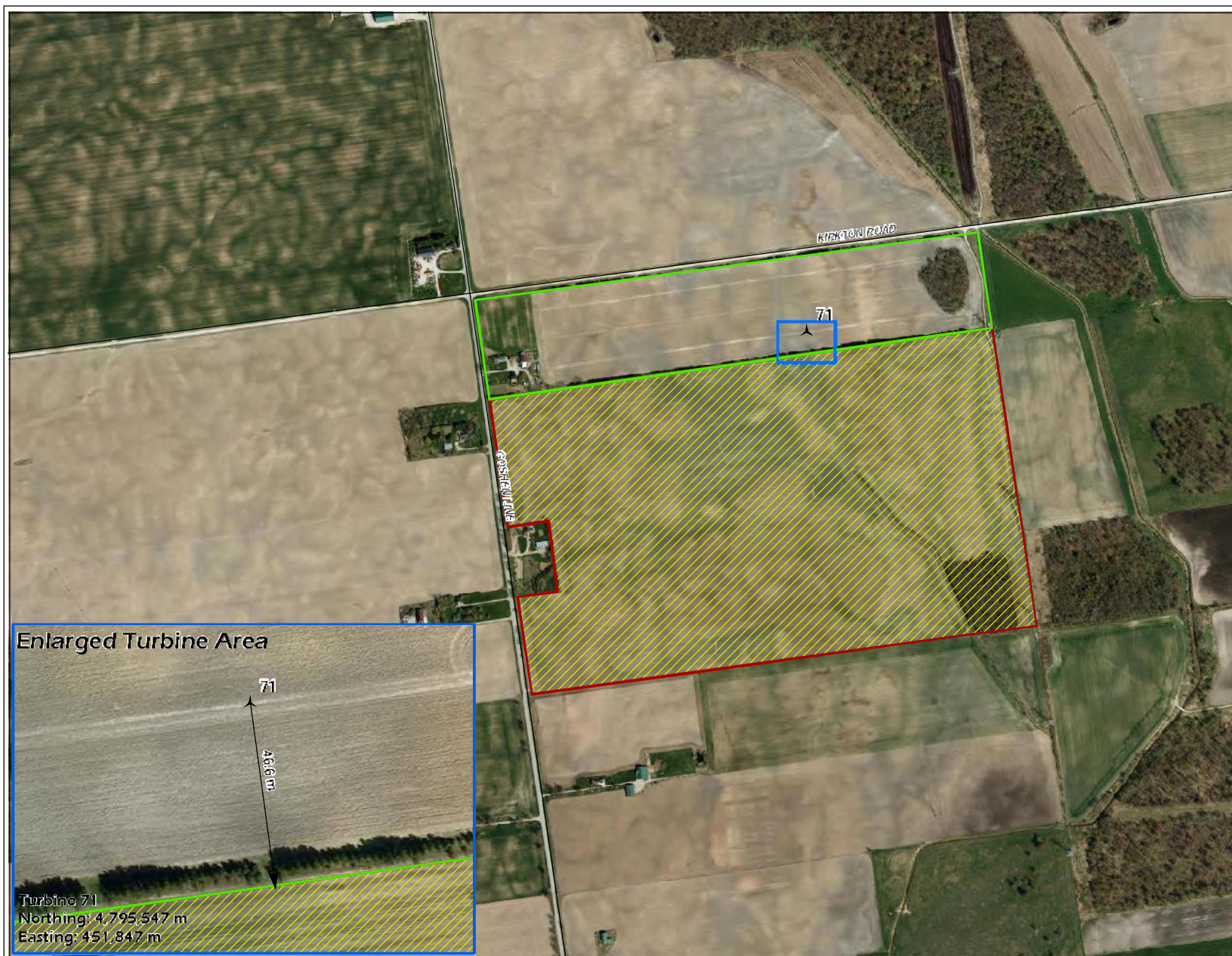
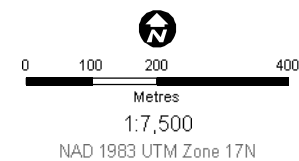
Neighbouring Land Parcel
Pt Lot 14 & Pt Lot 15, Con 12

Required Lotline Setback

Agreement Will Be in Place
With Assessment - No Setback
Required

No Agreement - 60m Setback
With Assessment

Turbine 71



Goshen
Wind Energy Centre
Huron County, Ontario

**Parcel Boundary Setback
Reduction Analysis**

Legend

-  Turbine Location
-  Host Land Parcel
Lot 12, Con River Aux Sauble
-  Neighbouring Land Parcel
S 1/2 Lot 11, Con River Aux
Sauble

Required Lotline Setback

-  Agreement Will Be in Place
With Assessment - No Setback
Required
-  No Agreement - 60m Setback
With Assessment

Turbine 84

