

Appendix E

Noise Report

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

GOSFIELD COMBER WIND PROJECT ESSEX, ONTARIO

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Executive Summary

The purpose of this environmental noise impact assessment, prepared for the Gosfield Comber Wind Project (the “Project”), is to fulfill the Brookfield Power Corporation’s requirements under Ontario Regulation 116/01 of the *Environmental Assessment Act* and to provide the basis for the Certificate of Approval – Air [“C of A (Air)”] under Section 9 of the *Environmental Protection Act* (“EPA”). The objective of this assessment is to demonstrate, by means of technical assessment, that the noise impact from the operation of the Project will comply with the Ministry of the Environment’s (“MOE”) environmental noise guidelines for wind turbines.

A baseline ambient noise survey was conducted within the project area to substantiate the regulatory sound level limit requirements for the Project. The noise data collected during the monitoring period was subsequently used to compare the existing ambient noise levels to the sound level limit requirements as defined in the MOE’s *Interpretation for Applying MOE NPC Technical Publications to Wind Turbine Generators (06 July 2004)*.

Building upon the project specific guidelines, noise impact prediction modelling was undertaken. The noise impact from the Project’s wind turbine array and transformers operating at maximum rated power on the nearest points of reception was predicted using an acoustic model, ISO 9613, as required by the MOE. Transformer noise barrier walls were also integrated into and considered within the analysis.

The analysis shows that the noise impact from the Project does not exceed the most restrictive nighttime noise limits that apply for areas with acoustic designation of Class 3 (Rural) as defined by the MOE. Consequently, there is no need for the application of any additional mitigation measures and no further studies are contemplated for environmental noise in relation to the Project.

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ATTACHMENT A

REPRINT OF: *INTERPRETATION FOR APPLYING MOE NPC TECHNICAL PUBLICATIONS TO WIND TURBINE GENERATORS*

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GLOSSARY

agl	above ground level
C of A (Air)	Certificate of Approval – Air
Brookfield	Brookfield Power Corporation
dB(A)	decibel A-weighted
ENIA	Environmental Noise Impact Assessment
EPA	<i>Environmental Protection Act</i>
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
kW	kilowatt
kV	kilovolt
LLA	Licence and Option to Lease Agreement
m	metre
m/s	metres per second
MOE	Ontario Ministry of the Environment
MW	Megawatt
PWL	Sound Power Level

1.0 INTRODUCTION

Brookfield Power Corporation (“Brookfield”) has retained Aercoustics Engineering Limited (“Aercoustics”) to prepare an environmental noise impact assessment (“ENIA”) of the proposed 249.2 mega watt (“MW”) Gosfield Comber Wind Project (“Project”). The Project is situated near Gosfield Comber, in Essex County, Ontario.

The Government of Ontario has made a commitment to the generation of electricity from renewable sources an important part of Ontario’s energy future. Specifically, the Government of Ontario has set targets of having 1,350 MW of new renewable generating capacity in service by 2007 and 2,700 MW in service by 2010. To assist in meeting these targets, Brookfield will be pursuing a renewable energy supply contract from the Ontario Power Authority (OPA) for the project.

The purpose of this ENIA is to fulfill Brookfield’s requirements under Ontario Regulation 116/01 of the *Environmental Assessment Act* and to provide the basis for the Certificate of Approval – Air [“C of A (Air)”] under Section 9 of the *Environmental Protection Act* (“EPA”). Consequently, in fulfilling these requirements, the objective of this assessment is twofold, to:

1. Confirm the sound level limit requirements for the Project by providing an assessment of the existing baseline environmental noise conditions in the vicinity of the Project; and
2. Predict the noise impacts from the Project at the nearest points of reception and to demonstrate, by means of technical assessment, that the noise impact from the operation of the Project will comply with the Ministry of the Environment’s (“MOE”) environmental noise guidelines for wind turbines.

The baseline noise data presented in this assessment have been used to compare the current ambient noise levels to the sound level limit requirements as defined by the MOE in their July 6, 2004 publication: *Interpretation For Applying MOE NPC Technical Publications to Wind Turbine Generators* (“MOE Interpretation”). For continued reference, the MOE Interpretation (ATTACHMENT A) was prepared to assist proponents of wind turbine installations in determining what information should be submitted when applying for a C of A (Air), under the EPA.

2.0 DISCUSSION OF ACOUSTIC TERMINOLOGY

In order to fully understand the analysis presented in this ENIA, a brief discussion of the technical terms utilized throughout the report is included below.

The noise data presented in this report has been given in terms of sound pressure level. Sound pressure levels are measured in decibels (“dB”). It is common practice to sum sound pressure levels over the entire audible spectrum to give an overall sound level.

The MOE requires that instantaneous sound pressure be processed by a special filter (i.e., A-weighting). As human hearing is less sensitive to low frequency sound, the weighting emphasizes the frequencies in the range 500 Hertz (“Hz”) to 4000 Hz; while progressively diminishing the relative contributions at high and low frequencies. This corresponds approximately to the hearing response to humans at normal sound levels (e.g., 50 dB). The resulting “A-weighted” sound level is often used as a criterion to indicate a maximum allowable sound level. In general, low frequencies are weighted higher (e.g., C-weighted).

Additional terms used to describe overall sound levels include the L_{eq} , L_{max} , L_{min} , as well as other statistical indices. The L_{eq} is defined as the equivalent continuous sound level, which, in a stated time and at a stated location, has the same energy as the time varying signal. It is common acoustical practice to measure L_{eq} sound levels, typically over a 1-hour duration, in order to obtain a representative average sound level. The L_{max} and L_{min} can be respectively defined as the maximum and minimum sound levels that occur over the same stated time and location as the L_{eq} .

Statistical indices, the most common of which is the L_{90} , can also be used to describe the distribution of sound levels within a community. The L_{90} is defined as the sound level exceeded 90% of the time and is used as a typical indicator of the “ambient” or “background” noise level in a given area or at a point of reception.

The MOE defines a “point of reception” as any point on the premises of a person within 30 m of a dwelling or camping area, where sound or vibration originating from other than those premises is received. The MOE designates points of reception into three classes:

- Class 1 refers to an acoustical environment typical of a major population centre where the background noise is dominated by the urban hum. These areas are highly urbanized and have moderate to high noise levels throughout the day and night.
- Class 2 means an area with an acoustic environment that has low ambient sound levels between 19:00 hours and 07:00 hours; where the evening and night-time levels are defined by natural sounds and infrequent human activity and there are no clearly audible sounds from stationary sources (e.g., industrial, commercial, etc.).
- Class 3 refers to areas that are rural and/or small communities with a population of less than 1,000 with an acoustic environment that is dominated by natural sounds and has little or no road traffic during the night-time period.

3.0 DESCRIPTION OF WIND TURBINE SITE AND SURROUNDS

The Project is located near Gosfield and Comber, County of Essex, Ontario. The closest communities in the vicinity of the Project are the Town of Comber and the Village of Cottam. The dominant environmental feature in the vicinity of the Project is Lake Erie, located south of the study area and Lake St. Clair north of the study area (Figure 1).

Consistent with the dominant land-use pattern apparent in the Township as a whole, the majority of forest cover has been removed during the process of settlement for rural and agricultural production. Forest cover within the area is limited to natural features and other localized areas that are not suited to agricultural production. Field crop production and modern livestock production dominate the turbine site locations and surrounding landscape.

As noted above, the wind plant will be designed to generate 249.2 MW of renewable electricity. One hundred and fifty one 1.65 MW wind turbines, along with one 34.5 kV / 230 kV transformer at a substation near Gosfield, and two 34.5 kV/230 kV transformers at a substation near Comber will be placed strategically over the study area as shown in Figure 2.

Within this agricultural / rural area, the main sources of ambient sound that currently exist include:

1. Vehicular traffic noise from provincial Highway 77 and 401 in the study area.
2. Vehicular traffic on County and Concession roads.
3. Sounds due to human activity as well as agricultural and rural activities.
4. Sounds due to human domestic activities such as property maintenance and recreation.
5. Natural sounds from wind noise, insects, wildlife, atmospheric effects, etc.

The acoustic classification of the area is generally Class 3 (rural).

3.1 Description of Receptors

Noise receptors have been selected for this analysis based on two criteria: i) their spatial proximity to the Project (i.e., receptors within 1,000 metres of a wind turbine); and ii) level of benefit derived from the Project (e.g., participating or non-participating receptors). A total of 691 non participating receptors are located within 1,000 metres of a proposed wind turbine and have been included for assessment.

All receptors in the study area were identified by Brookfield through site visits and interpretation of high resolution aerial photography flown in 2006 specifically for the Project. Each receptor has been assigned a unique identifier for modelling and reporting purposes. Their locations relative to the wind turbines and transformer station are shown in Figure 2. The zoning and property boundaries are shown in Figure 2 and Attachment F.

For the purposes of this ENIA, points of reception have been inspected to verify which dwellings are either two-story residences or single storey residences.

3.2 MOE Environmental Noise Limits

The sound limit requirements for a wind turbine or an array of such units, termed a “wind plant”, have been established in accordance with the existing MOE publications (NPC-205/232/233) as well as the wind induced background noise level. The specific definition of sound limits, expressed as a function of wind speed and ambient noise levels, as outlined in the MOE Interpretation, includes the following:

3.2.1 *Wind Turbine Installations in Class 1 & 2 Areas (Urban): Wind Speeds Below 8m/s*

The lowest sound level limit at a Point of Reception in Class 1 and 2 Areas (Urban), under conditions of average wind speed up to 8 m/s (i.e., 29km/h), expressed in terms of the hourly L_{eq} is 45 dB(A) or the minimum hourly background sound level established in accordance with requirements in Publications NPC-205/NPC-233, whichever is higher.

3.2.2 *Wind Turbine Installations In Class 3 Areas (Rural): Wind Speeds Below 6m/s*

The lowest sound level limit at a Point of Reception in Class 3 Areas (Rural), under conditions of average wind speed up to 6 m/s (i.e., 22km/h), expressed in terms of the hourly L_{eq} is 40 dB(A) or the minimum hourly background sound level established in accordance with requirements in Publications NPC-232/NPC-233, whichever is higher.

3.2.3 Wind Turbine Installations In Class 1 & 2 and Class 3 Areas: Wind Speeds Above 8m/s and 6m/s Respectively

The sound level limit at a Point of Reception in Class Areas 1 & 2 (Urban) or in Class 3 Areas (Rural), under conditions of average wind speed above 8 m/s and 6m/s respectively, expressed in terms of the hourly L_{eq} , is the wind induced background sound level, expressed in terms of ninetieth percentile sound level (L_{A90}) plus 7 dB, or the minimum hourly background sound level established in accordance with requirements in Publications NPC-205/NPC-232/NPC-233, whichever is higher. A summary of the above limits is shown in Table 1 for continued reference.

Table 1: MOE Sound Level Limits at Points of Reception for Wind Plants

Wind Speed (m/s)	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s
Wind Turbine Noise Criterion NPC-232 (dBA) Class 3	40 dBA	40 dBA	40 dBA	43 dBA	45 dBA	49 dBA	51 dBA	53 dBA
Wind Turbine Noise Criterion NPC-205 (dBA) Class 1 & 2	45 dBA	45 dBA	45 dBA	45 dBA	45 dBA	49 dBA	51 dBA	53 dBA

Notes:

1. The measurement of wind induced background sound level is not required to establish the applicable criterion. The wind induced background sound level reference curve was determined by correlating the ninetieth percentile sound level (L_{A90}) with the average wind speed measured at a particularly quiet site.
2. If the existing minimum hourly background sound level, established in accordance with requirements in Publications NPC-205/NPC-232/NPC-233, is selected as the sound level limit, the measurement of wind speed (for the purpose of determination of wind induced background sound level) is not required. The selected limit applies in the entire range of wind speed under consideration from 4m/s to 11m/s with the exception of wind turbine noise criterion values higher than the existing minimum hourly background sound level.
3. Wind Turbine Noise Criterion at wind speeds expressed as fractional values of m/s should be interpolated from the above table.

3.3 Environmental Noise Monitoring Program

3.3.1 Monitoring Protocol

Monitoring was conducted in accordance with the requirements defined by MOE in their NPC-103 publication. Long-term monitoring at four sites throughout the study area was carried out between 27 April 2007 and 07 May 2007, and included weekend periods. This resulted in approximately 264 hours of continuous data collection at each location. All of the data collected exceeds the minimum MOE requirement of 48 hours of data including a Saturday and Sunday.

Weather conditions encountered during the monitoring period included wind induced background noise below the level specified by MOE in NPC-103, which typically specifies wind speeds below 25 kph and temperatures above –5 degrees Celsius which is acceptable for the acquisition of reliable ambient environmental noise data. Additional information on the monitoring protocol is provided in ATTACHMENT B

3.3.2 Monitoring Locations

Ambient environmental noise monitoring was conducted at four locations within the study area as shown in Figure 10. The monitoring locations were selected based upon the potential project layout and/or their representativeness of environs within the study area. Table 2 provides a summary description of each monitoring site as well as proximity to adjacent transportation corridors.

Table 2: Description & Classification of Monitoring Locations

Monitoring Location	Site Description	Dwelling Distances
Site 1	LOT 20, CONN. 6. In South portion of Gosfield study area. 40m from 7th Concession (160m from Graham Sideroad). Site is located on 7th Concession on the south side. Fischer residence, street address #118E.	40m from 7 th Concession centerline. Other homes nearby similar setback (+-10m) 160m from Graham SDRD. Monitor 15m from home
Site 2	LOT 22 CONN. 8. In the Central East portion of the Gosfield study area. 55m from County Road 14 (in between Graham Sideroad & Albuna Tlln). Site is located on County Road 14 on south side. Sherk residence, street address #336E.	55m from County Road 14 centerline. Typical setback of homes in area. Over 1km from Albuna Tlln. Monitor 15m from home.
Site 3 (home rear)	LOT 7, CONN 9. Central portion of the Comber study area. 71m from Highway 77 (300m from 10 th Road). Site is located on Highway 77 on east side. Metz residence, street address #9650.	71m from Highway 77 road centerline. Typical setback for rear yards of homes in the area. 300m from 10 th Road. Monitor 19m from home.
Site 3 (home front)	LOT 7, CONN 9. Central portion of the Comber study area. 41m from Highway 77 (300m from 10 th Road). Site is located on Highway 77 on east side. Metz residence, street address #9650.	41m from Highway 77 road centerline. Typical setback for front of homes in the area. 300m from 10 th Road. Monitor 15m from home.
Site 4	LOT 5, CONN 6. North West portion of the Comber study area. 30m from Middle Road a.k.a. 46 (about 1.3km from Highway 77). Buchanan residence, street address #5105.	30m from Middle Road centerline. Typical setback of homes in area (+-10m). Over 1km from Highway 77. Monitor 30m from home.

3.3.3 Monitoring Results

The lowest levels typically prevailed during night-time periods and early morning periods (i.e. 00:00 – 05:00 hrs), especially during weekend/Sunday hours. Noise levels were measured to be generally higher during the day as a result of greater local activity and increased noise due to comparatively higher volumes of traffic on Highways 77 and 401 in comparison to other municipal roads. In addition, domestic and other agricultural activities are also generally greater during daytime hours.

A graphical summary of the long-term environmental noise monitoring that was conducted at Locations 1 through 4 is presented in ATTACHMENT B, along with the raw ambient sound data. A summary of the sound level statistics obtained at the monitoring locations is also given in ATTACHMENT B and provided in Table 3.

Table 3: Summary of 1 Hour Leq Sound Levels

Monitoring Location	Period	L _{EQ}	
		min[dB(A)]	max[dB(A)]
Monitor Site 1, (front of house)	Daytime 0700-1900	47.5 dBA	70.5 dBA
	Evening 1900-2300	47 dBA	57.5 dBA
	Night 2300-0700	37 dBA	56 dBA
Monitor Site 2, (front of house)	Daytime 0700-1900	46 dBA	71 dBA
	Evening 1900-2300	43.5 dBA	55 dBA
	Night 2300-0700	36 dBA	55.5 dBA
Monitor Site 3 (Rear of house)	Daytime 0700-1900	50.5 dBA	64 dBA
	Evening 1900-2300	51 dBA	68.5 dBA
	Night 2300-0700	44.5 dBA	56.5 dBA
Monitor Site 3 (front of house)	Daytime 0700-1900	56.3 dBA	74.7 dBA
	Evening 1900-2300	56.8 dBA	62.6 dBA
	Night 2300-0700	48.1 dBA	62.6 dBA
Monitor Site 4 (front of house)	Daytime 0700-1900	53 dBA	71 dBA
	Evening 1900-2300	51 dBA	57 dBA
	Night 2300-0700	40.5 dBA	59.5 dBA

Based upon the results of the ambient monitoring program, monitoring locations 1, 2 and 4 are representative of a Class 3 receptor area because the projected noise in the rear yard is less than 40 dBA at night and less than 50 dBA during the day. According to MOE guidelines this area is defined as a rural area with an acoustical environment that is dominated by natural sounds having

little or no road traffic. MOE sound limit publication, NPC-232, typically applies to the assessment of stationary noise source effects in rural areas. These areas are assessed as Class 3 (rural) areas for the purposes of noise impact assessment (section 5).

Monitoring location 3 adjacent to Highway 77 appears rural because the housing density is quite low, but the noise environment is characterized as a Class 2; because there is daytime urban hum from road traffic and a background noise environment which is dominated by natural sounds such as birds, insects, wildlife, atmospheric effects, etc. The worst case point of reception for houses on Highway 77 is behind the house where traffic ambient is low and where potential wind turbine noise is higher. In this instance, a sound level limit that is above the 40 dB(A) minimum would apply. This conclusion is directly supported by the site measurements that showed the lowest 1 hour L_{eq} measured over a 213 hour period was 44.5 dBA near the rear of the house, and the lowest daytime ambient noise was 50.5 dBA near the rear of the house.

3.3.4 Receptor Sound Limits

Based upon the recorded ambient conditions, and considering the MOE publications related to receptor classifications, the Table below provides the Classification of receptors and the applicable regulatory sound limit for each location and adjacent areas.

Table 4: Sound Limits at Receptors

Monitoring Location	Regulatory Sound Limit [dB(A) and ≤ 6 m/s wind speed] Receptor Class
Monitor Site 1	40 dBA, Class 3
Monitor Site 2	40 dBA, Class 3
Monitor Site 3	45 dBA, Class 2
Monitor Site 4	40 dBA, Class 3

The Project sound limits are ultimately a function of several variables:

1. current ambient levels due to sound levels caused by both natural and human activity (e.g., traffic) sounds
2. acoustic classification of the study area (e.g., Class 2 and/or Class 3 as defined by MOE)
3. wind induced background sound levels.

It should be noted that although two classification zones were identified, based upon the results of the long-term ambient monitoring program, the ENIA has opted to apply the more conservative Class 3 (Rural) values to all territories within the study area in order to maintain additional conservancy in the assessment and interpretation of the results.

For the purposes of this environmental noise impact assessment, the Class 3 minimum sound level limit has been applied to the all receptors excluding those receptors adjacent to Highway 77.

Table 5: Sound Level Limits for Class 3 Areas

Wind Speed (m/s)	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s
Wind Turbine Sound Level Limit [dB(A)] (Class 3 Area, NPC-232)	40 dBA	40 dBA	40 dBA	43 dBA	45 dBA	49 dBA	51 dBA	53 dBA

Receptors adjacent to Highway 77 are exposed to higher traffic ambient noise depending on their setback to Highway 77 road centerline. Receptors adjacent to Highway 77 with large setbacks have lower Class 3 sound level limits while receptors very close to Highway 77 transition to higher Class 2 sound level limits.

Setback distances have been calculated to determine sound level limits at a rear window or rear patio area, based on the measured quietest daytime hour measured at monitor site 3 near the rear corner of the house, which is located adjacent to Highway 77. The measured minimum daytime noise is 50.5 dBA at monitor site #3, for the monitor 19m from the rear corner of the house, or 71m from Hwy 77 road centerline (see Attachment B). The bungalow house at monitor site #3 is setback 46m from the center of the house to Highway 77 road centerline. Predicted minimum daytime noise at the rear façade, in the middle of a bungalow house, is 46.3 dBA, or 4.2 dBA less than the measured noise 19m from the rear corner of the house. The MOE's traffic prediction computer program "Stamson 5.03" was used to predict noise at the rear of a bungalow façade, using calibrated minimum hourly traffic of 183 cars/hour, 5 medium trucks per hour and 6 heavy trucks per hour, based on the measured minimum daytime noise of 50.5 dBA near the rear corner. The AADT for Hwy 77 near monitor site #3 is AADT = 3050, for the year 2004. See attachment B.

Table 6 Sound Level Limits for Class 2 Areas adjacent to Highway 77

Setback Distance: Middle of house to Hwy 77 road centerline	Wind Speed (m/s)	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s
61m	Wind Turbine Sound Level Limit [dB(A)]	40 dBA	40 dBA	40 dBA	43 dBA	45 dBA	49 dBA	51 dBA	53 dBA
49m	Wind Turbine Sound Level Limit [dB(A)]	41 dBA	41 dBA	41 dBA	43 dBA	45 dBA	49 dBA	51 dBA	53 dBA
40m	Wind Turbine Sound Level Limit [dB(A)]	42 dBA	42 dBA	42 dBA	43 dBA	45 dBA	49 dBA	51 dBA	53 dBA
31m	Wind Turbine Sound Level Limit [dB(A)]	43 dBA	43 dBA	43 dBA	43 dBA	45 dBA	49 dBA	51 dBA	53 dBA
24 m	Wind Turbine Sound Level Limit [dB(A)]	44 dBA	44 dBA	44 dBA	44 dBA	45 dBA	49 dBA	51 dBA	53 dBA
17.5m	Wind Turbine Sound Level Limit [dB(A)]	45 dBA	45 dBA	45 dBA	45 dBA	45 dBA	49 dBA	51 dBA	53 dBA

4.0 DESCRIPTION OF SOURCES

4.1 Gosfield Transformer Station

Brookfield plans to build a transformer substation north of 8th Concession, east of the Hydro right of way as part of the Project. This substation will contain one 115/34.5 kV transformer within the chain-linked fenced area (See Figure 10)

The manufacturer's data sheet for this transformer indicates a maximum sound emission level of 80 dB(A) measured in accordance with the IEEE standard C57.12.90-1999. This is the average sound pressure level measured at a distance of 2 m from the transformer cooling fans. The data sheet is attached in Attachment D.

The noise contribution from the substation is calculated using the DataKustik CadnaA version 3.6 environmental noise prediction software. The calculations are based on established prediction methods approved by the MOE: ISO 9613-2 standard entitled "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation". For this analysis, the noise contribution from the substation was added to the noise contributions of the wind turbines to assess the total cumulative effect of the Project.

IEEE C57.12.90-1993 standard, "Distribution, Power, and Regulating Transformers" has been used to develop the noise modelling parameters. This standard outlines a nearfield sound level specification for the transformer. Each transformer in this study is modelled having five radiating area sources. Four of which are representative of the sides of the transformer, while the fifth represents the top.

The vertical area sources have been modelled to have a maximum source height of 3.85 m, which is the overall height of the acoustical vertical area enveloping the transformer. ATTACHMENT D provides the manufacturer's drawings outlining the physical height of the transformer. This modelling protocol is in accordance with the IEEE standard.

4.1.1 Potential Sources of Noise

Transformer noise is comprised of casing noise emitted from the operating transformer itself and cooling fan noise. Transformer noise has a pronounced audible tonal quality and has been considered in the analysis that follows.

4.1.2 Transformer Station Noise Emission Rating

The acoustic measurement surface of a transformer is 6.54 m long by 10.27 m wide by 3.85 m high. The Cadna acoustic model surface is taken to be 0.3 m from the transformer tank or transformer cooling fan whichever is more outboard. The calculated sound power level for each vertical surface is based upon the area of the acoustic measurement surface. The horizontal area of the top of the transformer is modelled in accordance with the IEEE standard for large transformers; in which the top is representative of 25% of the total vertical measurement surface area. Therefore, the calculated sound power level for the top of the transformer is based on 32.4 m². The tables below outline the sound power spectrum that was used for each transformer's four vertical area sources and top horizontal surface.

Table 7: Transformer Average Sound Pressure Level @ the measurement surface

Octave Band Center Freq. (Hz)	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	dBA
Gosfield Transformer As per IEEE standard C57.12.90-1999 (spectrum in dB)	76.6 dB	70.6 dB	77.6 dB	74.6 dB	82.6 dB	68.6 dB	49.6 dB	45.6 dB	41.6 dB	80 dBA

Table 8: Calculated Sound Power for Transformer Faces

Octave Band Center Freq. (Hz)	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	dBA
Transformer North Face (6.54m x 3.85m @ 80 dBA) (spectrum in dB)	90.6 dB	84.6 dB	91.6 dB	88.6 dB	96.6 dB	82.6 dB	63.6 dB	59.6 dB	55.6 dB	94.0 dBA
Transformer South Face (6.54m x 3.85m @ 80 dBA) (spectrum in dB)	90.6 dB	84.6 dB	91.6 dB	88.6 dB	96.6 dB	82.6 dB	63.6 dB	59.6 dB	55.6 dB	94.0 dBA
Transformer East Face (10.27m x 3.85m @ 80 dBA) (spectrum in dB)	92.6 dB	86.6 dB	93.6 dB	90.6 dB	98.6 dB	84.6 dB	65.6 dB	61.6 dB	57.6 dB	96.0 dBA
Transformer West Face (10.27m x 3.85m @ 80 dBA) (spectrum in dB)	92.6 dB	86.6 dB	93.6 dB	90.6 dB	98.6 dB	84.6 dB	65.6 dB	61.6 dB	57.6 dB	96.0 dBA
Transformer Top Face (32.4 m ² @ 80 dBA) spectrum in dB	91.7 dB	85.7 dB	92.7 dB	89.7 dB	97.7 dB	83.7 dB	64.7 dB	60.7 dB	56.7 dB	95.1 dBA

The above listed spectrums correspond to the total sound power level for each of the vertical area sources used to model the transformer for the typical worst case operating scenario as zero to full load with all cooling equipment operating. It should be noted that this spectrum does not account for tonality. Thus, a 5 dB penalty, consistent with MOE guideline NPC 104, has been included in this analysis. Consequently, the overall source sound power including tonality was amended to be 99.0 dB(A) for the north or south face and 101.0 dBA for the east or west face for purposes of this analysis to maintain additional conservancy in the model results.

Similar to the vertical face sources, this spectrum does not account for tonality from the top face. Thus, following the same methodology noted above, a 5 dB penalty was included in this analysis. This creates an overall source sound power level for the top of the transformer, including tonality, of 101.1 dB(A). The tonal adjusted value of 101.1 dB(A) is utilized in this analysis to maintain additional conservancy in the model results.

4.2 Comber Transformer Station

Brookfield plans to build a transformer substation north of South Middle Road, west of Highway 77, south of the Hydro right of way as part of the Project. This substation will contain two identical 230/34.5 kV transformers situated side-by-side within the chain-linked fenced area (See Figures 11)

The manufacturer's data sheet for this transformer indicates a maximum sound emission level of 81 dB(A) measured in accordance with the IEEE standard C57.12.90-1999. This is the average sound pressure level measured at a distance of 2 m from the transformer cooling fans. The data sheet is attached in Attachment D.

The noise contribution from the substation is calculated using the DataKustik CadnaA version 3.6 environmental noise prediction software. The calculations are based on established prediction methods approved by the MOE: ISO 9613-2 standard entitled "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation". For this analysis, the noise contribution from the substation was added to the noise contributions of the wind turbines to assess the total cumulative effect of the Project.

IEEE C57.12.90-1993 standard, "Distribution, Power, and Regulating Transformers" has been used to develop the noise modelling parameters. This standard outlines a nearfield sound level specification for the transformer. Each transformer in this study is modelled having five radiating area sources. Four of which are representative of the sides of the transformer, while the fifth represents the top.

The vertical area sources have been modelled to have a maximum source height of 4.24 m, which is the overall height of the acoustical vertical area enveloping the transformer. ATTACHMENT D provides the manufacturer's drawings outlining the physical height of the transformer. This modelling protocol is in accordance with the IEEE standard.

4.2.1 Potential Sources of Noise

Transformer noise is comprised of casing noise emitted from the operating transformer itself and cooling fan noise. Transformer noise has a pronounced audible tonal quality and has been considered in the analysis that follows.

4.2.2 Transformer Station Noise Emission Rating

The acoustic measurement surface of a transformer is 7.62 m long by 10.78 m wide by 4.24 m high. The Cadna acoustic model surface is taken to be 0.3 m from the transformer tank or transformer cooling fan whichever is more outboard. The calculated sound power level for each vertical surface is based upon the area of the acoustic measurement surface. The horizontal area of the top of the transformer is modelled in accordance with the IEEE standard for large transformers; in which the top is representative of 25% of the total vertical measurement surface area. Therefore, the calculated sound power level for the top of the transformer is based on 39.0 m². The tables below outline the sound power spectrum that was used for each transformer's four vertical area sources and top horizontal surface.

Table 9: Transformer Average Sound Pressure Level @ the measurement surface

Octave Band Center Freq. (Hz)	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	dBA
Comber Transformer As per IEEE standard C57.12.90-1999 (spectrum in dB)	77.6 dB	71.6 dB	78.6 dB	75.6 dB	83.6 dB	69.6 dB	50.6 dB	46.6 dB	42.6 dB	81 dBA

Table 10: Calculated Sound Power for Transformer Faces

Octave Band Center Freq. (Hz)	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	dBA
Transformer North Face (7.62m x 4.24m @ 81 dBA) (spectrum in dB)	92.7 dB	86.7 dB	93.7 dB	90.7 dB	98.7 dB	84.7 dB	65.7 dB	61.7 dB	57.7 dB	96.1 dBA
Transformer South Face (7.62m x 4.24m @ 81 dBA) (spectrum in dB)	92.7 dB	86.7 dB	93.7 dB	90.7 dB	98.7 dB	84.7 dB	65.7 dB	61.7 dB	57.7 dB	96.1 dBA
Transformer East Face (10.78m x 4.24m @ 81 dBA) (spectrum in dB)	94.2 dB	88.2 dB	95.2 dB	92.2 dB	100.2 dB	86.2 dB	67.2 dB	63.2 dB	59.2 dB	97.6 dBA
Transformer West Face (10.78m x 4.24m @ 81 dBA) (spectrum in dB)	94.2 dB	88.2 dB	95.2 dB	92.2 dB	100.2 dB	86.2 dB	67.2 dB	63.2 dB	59.2 dB	97.6 dBA
Transformer Top Face (39.0 m ² @ 81 dBA) spectrum in dB	93.5 dB	87.5 dB	94.5 dB	91.5 dB	99.5 dB	85.5 dB	66.5 dB	62.5 dB	58.5 dB	96.9 dBA

The above listed spectrums correspond to the total sound power level for each of the vertical area sources used to model the transformer for the typical worst case operating scenario as zero to full load with all cooling equipment operating. It should be noted that this spectrum does not account for tonality. Thus, a 5 dB penalty, consistent with MOE guideline NPC 104, has been included in this analysis. Consequently, the overall source sound power including tonality was amended to be 101.1 dB(A) for the north or south face and 102.6 dBA for the east or west face for purposes of this analysis to maintain additional conservatism in the model results.

Similar to the vertical face sources, this spectrum does not account for tonality from the top face. Thus, following the same methodology noted above, a 5 dB penalty was included in this analysis. This creates an overall source sound power level for the top of the transformer, including tonality, of 101.1 dB(A). The tonal adjusted value of 101.9 dB(A) is utilized in this analysis to maintain additional conservatism in the model results.

4.3 Blasting Noise and Vibration

Although not certain at the time of writing, given the proximity of bedrock to the ground surface at Gosfield Comber, it is very unlikely that Brookfield will need to perform blasting operations during the construction of the Project. Should blasting be required, noise and vibration levels from any required blasting activities will be required to meet the MOE guideline as set out in MOE publication NPC 119.

Based upon NPC 119, if the entity in charge of the blasting operation carries out routine monitoring of peak pressure level, the peak pressure level limit for sound concussion resulting from blasting can be 128 dB. If the routine monitoring is not carried out, then the peak pressure level limit for sound concussion from blasting should be 120 dB.

Consistent with NPC 119, if the entity in charge of the blasting operation carries out routine monitoring of vibration, the peak particle velocity limit for vibration resulting from blasting can be 1.25 cm/s. If routine vibration monitoring is not carried out, then the peak particle velocity limit for vibration from blasting should be 1.00 cm/s.

4.4 Wind Turbine Generators

All of the wind turbines utilized by the Project will be Vestas Model NM82/1650 (now known as Model V82) wind turbines. These are turbines designed for medium and high-wind sites and are well suited for energy extraction in the Gosfield Comber area. As evidenced by the model classification, the Vestas NM82/1650 has a nominal rating of 1.65 MW. It has a three-bladed upwind rotor that drives an electric asynchronous generator via a planetary gear. Each blade has a length of 41 metres.

The Vestas turbine is a constant speed upwind turbine with active yaw control and comes equipped with a microprocessor-controlled pitch regulating system. A separate hydraulic pitch cylinder for each blade is situated within the nacelle. The generator and associated gearing are housed in a nacelle that is mounted on an 80 m high tower. The nacelle unit is free to turn into the wind.

Other features of the Vestas NM82/1650 include:

- typical rotor speed of revolution: 14.4 rpm
- air brake: three separate pitch settings
- cut-in wind speed: 4 m/s (14.4 km/h)
- full power wind speed: 13 m/s (46.8 km/h)
- cut-out wind speed: 20 m/s
- generator: 60 Hz, 690 V, and 1,800 – 1980 rpm.

Additional information on the Vestas NM18/1650 is provided in ATTACHMENT C. Turbine coordinates are listed in Table 17 and Attachment F.

4.4.1 *Potential Sources of Noise*

There are several sources that contribute to the sound emitted by a typical wind turbine. As the rotating blades of the turbine extract power from the air-stream, the blades experience lift and drag forces. These forces generate sound, much in the same manner as a rotating propeller or fan – also known as aerodynamic noise. The sound is predominantly tonal in the vicinity of the turbine, with the fundamental sound established by the blade passage frequency, which is the product of the total number of blades and the rotation rate. For the proposed turbines the blade passage has a maximum frequency of 1 Hz. This is well below the audible frequency range (i.e., 20 Hz to 16,000 Hz).

Sounds with frequency contents below 20 Hz are often referred to as infrasound. There are many other sources of infrasound such as those generated by winds, waterfalls, and the sound of waves breaking on the beach. Measurements at 200 m from typical units have shown that the infrasound levels are well below the level of audibility [1],[2]. As noted above, there are no non-participating Points of Reception within 300 m of a wind turbine and thus the potential effect of infrasound is not anticipated.

Another source of sound is the periodic interaction of the “wakes” that are shed from the blades with the tower. The magnitude of this interaction is a function of the physical separation of the rotor disk and the tower. For modern turbines, such as those used for this Project, this separation is sufficiently large so that little sound is generated from wake-cutting. Although the sound is likely not loud enough to be perceived at distances greater than twice the tower height (e.g., 160 metres), it may be perceived close to the turbine. At these close-in distances the dominant contribution to the unsteady pressures is not sound, but the unsteady aerodynamic pressure field that is induced by the blades of the turbine. In contrast to sound, this pressure field is trapped and decays exponentially. There are no non-participating Points of Reception within 300 m of a wind turbine and thus this potential noise effect is not anticipated.

Perceptible sounds are generated predominantly by mechanical gears, the electric generator and a characteristic “swoosh” which is essentially higher frequency broadband noise that is amplitude modulated at a low frequency [1],[2]. In contrast to the first-generation wind turbines, some 30 years ago, innovations in blade geometry, materials, and mechanical systems have significantly lowered the sound power levels of present generation wind turbines, like those used for this Project.

4.4.2 Wind Turbine Noise Emission Rating

With a rotor speed of 14.4 rpm the resultant blade passage frequency is 0.72 Hz. Vestas has provided Brookfield with noise guarantees for the NM82/1650 wind turbines for wind speeds of 6m/s to 11m/s with a quality assurance of +/- 1 dBA. See Table 11 below and Attachment C.

Table 11: Wind Turbine Sound Emission Guarantees

Turbine Model	PWL(A) @ selected wind speed (m/s)					
	≤6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s
Vestas NM82/1650	102.4 dBA	104 dBA	106.9 dBA	108.9 dBA	109.9 dBA	108.7 dBA

Typical noise emission spectrums for 6m/s, 7m/s and 8m/s wind speed, for wind at a 10m reference height was provided by Vestas (see Attachment C). Aercoustics derived noise emission spectrums for all other wind speeds by making linear adjustments to the Vestas 8 m/s spectrum such that each spectrum summed to the overall Vestas sound emission guarantee for wind speeds from 9m/s to 11 m/s. Table 12 presents all the turbine noise emission spectrums that were used in the noise assessment calculations.

Table 12: ENIA Sound Power Spectrums @ wind speeds from 6m/s to 11m/s for Vestas NM82/1650

Wind Speed (m/s)	Wind Turbine PWL @ 31.5 Hz	Wind Turbine PWL @ 63 Hz	Wind Turbine PWL @ 125 Hz	Wind Turbine PWL @ 250 Hz	Wind Turbine PWL @ 500 Hz	Wind Turbine PWL @ 1k Hz	Wind Turbine PWL @ 2k Hz	Wind Turbine PWL @ 4k Hz	Wind Turbine PWL @ 8k Hz	Overall PWL dBA
6 m/s	118.4 dB	108 dB	105.9 dB	104.5 dB	99.2 dB	96.0 dB	92.7 dB	91.7 dB	80.0 dB	102.4 dBA
7 m/s	119.4 dB	111.4 dB	108.5 dB	106.4 dB	100.9 dB	97.5 dB	94 dB	92.1 dB	82.5 dB	104.0 dBA
8 m/s	121.4 dB	114.7 dB	111.6 dB	108.7 dB	103.4 dB	101.1 dB	96.9 dB	95.2 dB	87.8 dB	106.9 dBA
9 m/s	123.4 dB	116.7 dB	113.3 dB	110.7 dB	105.4 dB	103.1 dB	98.9 dB	97.2 dB	89.8 dB	108.9 dBA
10 m/s	124.4 dB	117.7 dB	114.6 dB	111.7 dB	106.4 dB	104.1 dB	99.9 dB	98.2 dB	90.8 dB	109.9 dBA
11 m/s	123.2 dB	116.5 dB	113.4 dB	110.5 dB	105.2 dB	102.9 dB	98.7 dB	97 dB	89.6 dB	108.7 dBA

Attachment C also presents a detailed noise measurement report by “Windtest GmbH” for a single Vestas NM82/1650 wind turbine. This noise emission report presents a tonal characteristic outlined in sound spectra measured in the vicinity of the turbine i.e. @ 121m from the tower. At all receptor distances, i.e. 300m and more distant, the wind turbine tone diminishes significantly such that a tonal penalty would not be appropriate. The 1000Hz tone component is attenuated approximately 10 dB, and furthermore the sound is masked by the wind.

5.0 MODEL RESULTS

5.1 Gosfield Transformer Station Impact Assessment

DataKustik CadnaA environmental noise model generated the worst-case results shown in Table 13. These results include sound power levels that account for tonality and contributions of the wind turbines. As indicated in the Table, and applying the conservative application of Class 3 (rural) areas to all Points of Reception, the transformers are not expected to meet the applicable noise guidelines without the application of abatement measures. The receptors identified in Table 13 are the worst-case receptors.

Table 13: Total Noise Impact without Transformer Noise Controls

Receptor	R_G259 (on 8 th Concession)	R_G208 (on County Rd. 14)	R_G195 (on County Rd. 14)	Allowable Level
Wind speed: 6m/s	44 dBA	41 dBA	41 dBA	40 dBA

5.1.1 Transformer Noise Controls

In order to satisfy the sound level limits at the receptor locations, a local acoustical barrier was applied as shown on Figure 10, 10B. The barrier would encompass the area proximal to the north, east, and south faces of the transformers, leaving the west and top faces exposed for cooling. The barrier would have a nominal height of at least 6 m (at least 2.5m above the top surface of the core of the transformer, see Figure 10B).

The acoustical barrier would be constructed using Durisol sound blocks, or equivalent. The acoustical wall should be free of any gaps, openings, or discontinuities, and should have a surface weight of at least 4lb/ft² (20kg/m²). Furthermore, the barrier should be an absorptive barrier to ensure that reflections are not a concern.

5.1.2 Cumulative Noise Effect

Based upon the above design considerations, the acoustical barrier was inserted into the DataKustik CadnaA environmental noise model. The model generated MOE compliant results as shown in Table 14. The resultant predicted worst-case conditions, are applied against the Class 3 (rural) designation, and account for tonality and contributions from the wind turbines.

Table 14: Cumulative Noise Impact with Transformer Barriers

Receptor	R_G259 (on 8 th Concession)	R_G208 (on County Rd. 14)	R_G195 (on County Rd. 14)	Allowable Level
Wind speed: 6m/s	40 dBA	40 dBA	40 dBA	40 dBA

5.2 Comber Transformer Station Impact Assessment

DataKustik CadnaA environmental noise model generated the worst-case results shown in Table 13. These results include sound power levels that account for tonality and contributions of the wind turbines. As indicated in the Table, and applying the conservative application of Class 3 (rural) areas to all Points of Reception, the transformers are not expected to meet the applicable noise guidelines without the application of abatement measures. The receptors identified in Table 15 are the worst-case receptors.

Table 15: Total Noise Impact without Transformer Noise Controls

Receptor	Rs_C1041 (on Middle Road)	Rs_C1027 (on Middle Road)	R_C1024 (on Middle Road)	Allowable Level
Wind speed: 6m/s	47 dBA	46 dBA	45 dBA	40 dBA

5.2.1 Transformer Noise Controls

In order to satisfy the sound level limits at the receptor locations, a local acoustical barrier was applied as shown on Figure 11, 11B. The barrier would encompass the area proximal to the north, east, and south faces of the transformers, leaving the west and top faces exposed for cooling. The barrier would have a nominal height of at least 7 m (at least 3m above the top surface of the core of the transformer, see Figure 11B).

The acoustical barrier would be constructed using Durisol sound blocks, or equivalent. The acoustical wall should be free of any gaps, openings, or discontinuities, and should have a surface weight of at least 4lb/ft² (20kg/m²). Furthermore, the barrier should be an absorptive barrier to ensure that reflections are not a concern.

5.2.2 Cumulative Noise Effect

Based upon the above design considerations, the acoustical barrier was inserted into the DataKustik CadnaA environmental noise model. The model generated MOE compliant results as shown in Table 16. The resultant predicted worst-case conditions, are applied against the Class 3 (rural) designation, and account for tonality and contributions from the wind turbines.

Table 16: Cumulative Noise Impact with Transformer Barriers

Receptor	Rs_C1041 (on Middle Road)	Rs_C1027 (on Middle Road)	R_C1024 (on Middle Road)	Allowable Level
Wind speed: 6m/s	37 dBA	38 dBA	40 dBA	40 dBA

5.3 Wind Turbine Impact Assessment

The noise impact at 832 receptors has been predicted using a formula based on ISO 9613-2 Part 2; consistent with the MOE's modelling requirements. The locations and sound power levels of all the wind turbine sources, the transformer station sources and the location of the receptors were integrated into a master data file.

Environmental noise is predicted for each of 12 different wind directions separately in 30 degree increments. Each wind direction results in noise predictions for the 832 receptors. The highest noise for each receptor is outlined in the assessment summary Table 18. The wind direction for the worst receptor is wind blowing from 0 degrees, i.e. wind from the north. Each receptor has its own worst case wind direction, which is the wind direction from its nearest turbine to the receptor. This wind direction is downwind noise propagation. The noise assessment accounts for all turbines running simultaneously. It is unrealistic that the wind blows downwind from each turbine to a receptor (i.e. multiple wind directions at the same time). The highest noise level for each receptor, which represents the worst-case prediction, is outlined below in the assessment summary Table 18.

The programme computes the octave band levels at the receptors from all the sound sources, including the transformers. The resultant A-weighted sound pressure levels are then transferred to the site map that shows both source and receiver locations. The detailed maps showing the locations of the wind turbines, transformer station, and the receptors are found in Figure 2 and Attachment F.

The residences of the landowners that have entered into a Licence and Option to Lease Agreement with Brookfield are not included in this analysis as they will receive a direct economic benefit from the project. Thus, these receptors, consistent with the MOE Guidance Note contained in Attachment A, were considered "participating" and excluded from further evaluation.

Maximum sound levels have been predicted at all 832 receptors, the detailed calculations are provided in ATTACHMENT E. The maximum predicted sound levels at all non-participating receptors are predicted to be within the MOE environmental noise limits for Class 3 (rural) areas.

5.4 Wind Turbine Summary Tables

The sound power emitted by the wind turbines and transformer station, as well as their location with respect to the receptors determines the sound pressure levels induced by the operation of all Project components. The acoustic power of each wind turbine as provided by the manufacturer is shown in ATTACHMENT C and summarized in Table 17.

Table 17: Wind Turbine Sound Emission Summary

Turbine Model	Turbine ID	Turbine Easting	Turbine Northing	PWL(A) at selected wind speed (m/s)					
				<=6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s
Vestas NM82/1650	T_G1	360252	4661361	102.4 dBA	104.0 dBA	106.9 dBA	108.9 dBA	109.9 dBA	108.7 dBA
Vestas NM82/1650	T_G2	361241	4663045	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G3	361070	4664754	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G4	361301	4664378	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G5	361531	4664112	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G6	361439	4664800	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G7	359355	4662788	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G8	360221	4662846	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G9	363328	4665267	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G10	360900	4664337	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G11	363538	4665737	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G12	359691	4664271	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G13	359372	4664438	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G14	359110	4664510	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G15	358825	4664630	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G18	361762	4665567	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G19	357788	4666027	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G20	357538	4667186	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G21	359650	4667250	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G22	357997	4668481	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G24	358304	4669006	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G26	360836	4664901	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G27	361714	4664536	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G30	358398	4665758	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G31	358696	4665836	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G32	359073	4665869	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G33	360833	4665244	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G35	362211	4665518	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G36	362677	4665510	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G37	363008	4665392	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G39	359457	4665866	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G40	359804	4665921	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G41	360860	4665598	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G43	361770	4665232	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G44	361819	4665945	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G46	359317	4667261	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G48	358569	4667174	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G49	358981	4667283	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G50	360003	4667299	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G54	362081	4666980	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G55	362117	4667395	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G56	358974	4668585	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G57	359090	4668298	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G59	358996	4668909	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G65	357912	4667206	102.4	104	106.9	108.9	109.9	108.7

Turbine Model	Turbine ID	Turbine Easting	Turbine Northing	PWL(A) at selected wind speed (m/s)					
				<=6	7	8	9	10	11
Vestas NM82/1650	T_G66	361111	4661761	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G69	359755	4663323	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_G70	357198	4667516	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C19	364249	4673174	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C21	365311	4671686	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C22	365103	4672846	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C24	365554	4672803	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C25	365844	4673688	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C26	366687	4671000	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C27	366773	4671746	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C28	366880	4672865	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C29	367135	4671354	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C30	367489	4672382	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C32	367406	4675254	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C35	366956	4675254	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C36	368291	4670566	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C37	368342	4671898	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C39	374429	4674339	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C40	368438	4673705	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C41	368573	4674987	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C42	368625	4675449	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C43	368784	4672027	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C44	368826	4674118	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C47	369184	4672027	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C48	369138	4670411	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C49	369392	4673163.5	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C50	369867	4670738	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C51	369584	4672027	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C52	369509	4670261	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C53	369862	4673200	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C54	370362	4673355	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C55	370292	4670738	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C56	369829	4671596	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C57	372631	4670256	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C58	369998	4670292	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C60	371170	4670256	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C62	365554	4672319.5	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C63	370501	4671596	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C64	370762	4673365	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C65	370412	4674491	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C66	370412	4674921	102.4	104	106.9	108.9	109.9	108.7

Turbine Model	Turbine ID	Turbine Easting	Turbine Northing	PWL(A) at selected wind speed (m/s)					
				<=6	7	8	9	10	11
Vestas NM82/1650	T_C67	370708	4670296	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C68	370717	4670738	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C69	376624	4672658	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C71	373711	4671364	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C72	371205	4673365	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C74	371631	4670256	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C75	371940	4670840	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C76	372105	4673030	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C77	372116	4674293	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C78	372815	4673259	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C79	372598	4671864	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C80	372742	4677552	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C81	372866	4674298	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C82	373137	4673011	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C84	373204	4671868	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C86	373311	4674264	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C87	373348	4677883	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C88	373673	4672750	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C89	373424	4673490	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C90	373633	4674051	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C92	373843	4673213	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C93	373871	4678083	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C94	374029	4674587	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C95	374111	4671364	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C96	374179	4672836	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C97	374301	4678355	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C99	374407	4675897	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C100	374485	4671688	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C101	374550	4677144	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C102	378276	4676824	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C103	377055	4675455	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C104	374866	4675746	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C105	374754	4672836	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C106	376026	4675904	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C107	375074	4676562	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C108	375094	4674096	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C110	376205	4675455	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C111	376605	4675927.5	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C112	375799	4674096	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C113	377249	4676051	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C114	375668	4674427	102.4	104	106.9	108.9	109.9	108.7

Turbine Model	Turbine ID	Turbine Easting	Turbine Northing	PWL(A) at selected wind speed (m/s)					
				<=6	7	8	9	10	11
Vestas NM82/1650	T_C115	376676	4676974	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C117	376275	4678632	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C118	376596	4673678	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C119	376688	4674177	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C120	376624	4673108	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C121	376605	4675455	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C123	377267	4672936	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C124	377476	4676974	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C126	377649	4676051	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C127	377471	4678538	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C128	377255	4674186	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C129	377644	4678189	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C130	377785	4675626	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C131	377924	4674277	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C132	377959	4673841	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C133	378363	4675126	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C134	378573	4678364	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C135	379430	4673555	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C136	379494	4674041	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C137	379505	4674762	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C138	379450	4675389	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C139	379894	4675440	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C145	377076	4676974	102.4	104	106.9	108.9	109.9	108.7
Vestas NM82/1650	T_C146	377876	4676924	102.4	104	106.9	108.9	109.9	108.7

The total noise impact at each receptor, including the wind turbines and transformer station, has been summarized in the noise assessment summary table (Table 18). The predicted sound pressure levels, as well as the sound level limits as set by either MOE NPC-205 or NPC 232, are included for easy reference. The noise impact from the simultaneous operation of all wind turbines and transformers is below the sound level limit associated with NPC 232 (i.e., 40 dBA). The noise assessment summary table presents the predicted sound levels for all 832 receptors that are located off the project sites and are within 1,000m of a wind turbine. It should be noted that receptor numbers are not perfectly contiguous due to various changes to the participating/non-participating stakeholder list over the course of project design activities and screening of all receptors within 1,000 meters of the proposed turbine locations.

Table 18 Wind Turbine and Transformer Noise Assessment Summary:

Point of Reception ID	Receptor Description		Distance to nearest Wind Turbine (m)	Turbine ID	Calculated Sound Pressure Level (dBA) at Selected Windspeeds (m/s)						Sound Level Limits (dBA) at Selected Windspeeds (m/s)						Background Level NPC 232	Compliance with Limit (Yes/No)	
					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C139	Residence	363577	4672606	880	T_C19	32	34	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C150	Residence	363818	4673296	448	T_C19	37	39	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C153	Bungalow	364640	4673193	391	T_C19	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C160	Residence	364811	4671906	546	T_C21	37	39	42	44	45	43	40	43	45	49	51	53	40	Yes
Rs_C174	Bungalow	364856	4671269	617	T_C21	34	36	38	40	41	40	40	43	45	49	51	53	40	Yes
RP_C176	Participating Res.	364875	4671849	466	T_C21	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
RsP_C180	Participating Bung.	364920	4672322	555	T_C22	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C191	Residence	365668	4673246	458	T_C24	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
R_C192	Residence	365705	4673238	460	T_C24	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
R_C195	Residence	366148	4673208	568	T_C25	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C199	Residence	366146	4672653	611	T_C24	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C201	Residence	366169	4671530	642	T_C27	38	40	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C202	Residence	366215	4671296	557	T_C26	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
R_C203	Residence	366114	4670744	628	T_C26	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
Rs_C204	Bungalow	366108	4670584	713	T_C26	33	35	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C205	Residence	366171	4670605	650	T_C26	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C208	Residence	366158	4670386	810	T_C26	34	35	38	40	41	40	40	43	45	49	51	53	40	Yes
Rs_C210	Bungalow	366272	4673203	647	T_C25	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C211	Residence	366336	4673138	609	T_C28	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C213	Residence	366259	4672948	626	T_C28	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
Rs_C217	Bungalow	366306	4672605	630	T_C28	37	39	42	44	45	43	40	43	45	49	51	53	40	Yes
R_C218	Residence	366269	4672281	716	T_C62	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
RsP_C220	Participating Bung.	366256	4671804	521	T_C27	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C228	Residence	366476	4673186	516	T_C28	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
R_C237	Residence	367436	4670312	892	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes

Point of Reception ID	Receptor Description			Distance to nearest Wind Turbine (m)	Turbine ID	Calculated Sound Pressure Level (dBA) at selected Windspeeds (m/s)						Sound Level Limits (dBA) at Selected Windspeeds (m/s)						Background Level NPC 232	Compliance with Limit (Yes/No)
						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
Rs_C238	Bungalow	367447	4670358	870	T_C36	34	35	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C242	Residence	367493	4670918	564	T_C29	38	40	42	44	45	44	40	43	45	49	51	53	40	Yes
RP_C244	Participating Res.	367506	4671140	429	T_C29	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
Rs_C245	Bungalow	367508	4671170	415	T_C29	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
RP_C251	Participating Res.	367538	4671530	439	T_C29	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C252	Residence	367559	4671861	526	T_C30	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C253	Residence	367635	4669981	879	T_C36	34	35	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C254	Residence	367663	4669980	859	T_C36	34	36	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C255	Residence	367693	4669978	839	T_C36	34	36	39	41	42	40	40	43	45	49	51	53	40	Yes
R_C256	Residence	367727	4670003	797	T_C36	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C257	Residence	367728	4670037	773	T_C36	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C258	Residence	367727	4670072	750	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C259	Residence	367731	4670101	728	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C260	Residence	367736	4670134	704	T_C36	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C262	Residence	367804	4670127	655	T_C36	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
RP_C263	Participating Res.	367793	4670867	581	T_C36	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C265	Residence	367808	4669969	768	T_C36	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C266	Residence	367832	4669967	755	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C267	Residence	367827	4670454	478	T_C36	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C523	Bungalow	365348	4673533	520	T_C25	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C524	Residence	365344	4673504	532	T_C25	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C525	Residence	365808	4674593	905	T_C25	33	35	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C526	Residence	365822	4674567	879	T_C25	33	35	38	40	41	39	40	43	45	49	51	53	40	Yes
R_C533	Residence	366802	4674417	851	T_C35	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C547	Residence	366245	4675856	931	T_C35	32	33	36	38	39	38	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C549	Residence	366256	4675736	850	T_C35	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C551	Residence	366307	4675439	674	T_C35	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C555	Residence	367602	4674387	889	T_C32	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
RP_C558	Participating Res.	367908	4672300	427	T_C30	40	42	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C559	Residence	367929	4669895	762	T_C36	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C560	Residence	367928	4669852	801	T_C36	34	36	39	41	42	40	40	43	45	49	51	53	40	Yes
RP_C564	Participating Res.	367929	4671901	413	T_C37	40	42	45	47	48	46	40	43	45	49	51	53	40	Yes
R_C565	Residence	367947	4672816	631	T_C30	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
RN_C566	Non-residential	367950	4669955	700	T_C36	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C569	Residence	367947	4669899	750	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C570	Residence	367986	4672571	532	T_C30	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C571	Residence	367967	4669946	699	T_C36	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C572	Residence	367991	4669945	690	T_C36	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C573	Residence	367968	4669901	739	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C575	Residence	368029	4669947	672	T_C36	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C576	Residence	368018	4669892	727	T_C36	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C577	Residence	368056	4669954	655	T_C36	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C579	Residence	368111	4669881	709	T_C36	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C580	Residence	368151	4669957	625	T_C36	36	38	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C581	Residence	368137	4669882	701	T_C36	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C582	Residence	368158	4669879	700	T_C36	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
RN_C583	Non-residential	368177	4669935	641	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C584	Residence	368194	4669936	637	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C585	Residence	368252	4669868	700	T_C36	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C586	Residence	368270	4669870	697	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C589	Residence	368306	4669870	697	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C594	Residence	368332	4669865	703	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C595	Residence	368349	4669864	705	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C596	Residence	368373	4669864	707	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C598	Residence	368389	4669918	655	T_C36	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C599	Residence	368414	4669924	654	T_C36	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C600	Residence	368390	4669862	711	T_C36	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C601	Residence	368450	4669912	673	T_C36	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C604	Bungalow	368458	4671362	548	T_C37	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
R_C606	Residence	368500	4669922	677	T_C36	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C607	Residence	368499	4669855	741	T_C36	36	38	41	43	44	42	40	43	45	49	51	53	40	Yes
Rs_C608	Bungalow	368487	4669774	816	T_C36	34	36	39	41	42	40	40	43	45	49	51	53	40	Yes
Rs_C609	Bungalow	368549	4672661	677	T_C43	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C610	Residence	368532	4669919	690	T_C36	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C613	Residence	368571	4669917	707	T_C36	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C614	Residence	368598	4669914	721	T_C36	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C615	Bungalow	368573	4669753	860	T_C36	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
Rs_C620	Bungalow	368855	4672644	621	T_C43	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
Rs_C623	Bungalow	368959	4669896	545	T_C48	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C624	Bungalow	368930	4669914	539	T_C48	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C626	Bungalow	368926	4671266	775	T_C43	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C627	Residence	369080	4672626	608	T_C47	40	42	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C631	Residence	369150	4669919	492	T_C48	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C634	Residence	369218	4671308	676	T_C56	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
RP_C635	Participating Res.	369442	4669857	409	T_C52	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
Rs_C637	Bungalow	369503	4669777	484	T_C52	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
Rs_C639	Bungalow	369462	4669802	462	T_C52	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C641	Residence	369744	4672583	579	T_C51	40	42	45	47	48	46	40	43	45	49	51	53	40	Yes
RP_C642	Participating Res.	369744	4669841	482	T_C52	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
RP_C646	Participating Res.	370018	4671251	394	T_C56	42	44	47	49	50	49	40	43	45	49	51	53	40	No
R_C649	Residence	370054	4669863	432	T_C58	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
Rs_C650	Bungalow	370166	4669733	584	T_C58	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C651	Residence	370164	4669679	635	T_C58	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
RP_C654	Participating Res.	370156	4672638	635	T_C53	39	41	44	46	47	45	40	43	45	49	51	53	40	Yes
R_C658	Residence	370119	4672641	615	T_C53	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C659	Residence	370146	4672563	697	T_C53	39	41	43	45	46	45	40	43	45	49	51	53	40	Yes
RP_C662	Participating Res.	370422	4671232	373	T_C63	42	44	47	49	50	49	40	43	45	49	51	53	40	No
RsP_C665	Participating Bung.	370536	4672531	842	T_C54	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C670	Residence	370652	4669869	431	T_C67	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
RP_C671	Participating Res.	370786	4672595	770	T_C64	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C673	Residence	370806	4672504	862	T_C64	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C675	Residence	370817	4669622	683	T_C67	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C677	Bungalow	370845	4672503	866	T_C64	36	38	41	43	44	42	40	43	45	49	51	53	40	Yes
Rs_C678	Bungalow	371037	4669683	588	T_C60	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C680	Bungalow	371069	4669691	574	T_C60	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C683	Bungalow	371373	4669819	482	T_C60	39	41	43	45	46	45	40	43	45	49	51	53	40	Yes
Rs_C684	Bungalow	371382	4669745	553	T_C60	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C685	Residence	371405	4669647	650	T_C74	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C690	Bungalow	371468	4671613	905	T_C75	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
Rs_C696	Bungalow	371414	4670897	529	T_C75	39	41	44	46	47	45	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
RP_C697	Participating Res.	371525	4670846	415	T_C75	41	42	45	47	48	47	40	43	45	49	51	53	40	No
RP_C698	Participating Res.	371526	4670807	415	T_C75	41	43	46	48	49	47	40	43	45	49	51	53	40	No
R_C700	Residence	371701	4669772	489	T_C74	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
RsP_C701	Participating Bung.	371733	4669769	498	T_C74	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C702	Residence	371708	4669643	618	T_C74	37	39	42	44	45	43	40	43	45	49	51	53	40	Yes
Rs_C703	Bungalow	371736	4669640	625	T_C74	36	38	40	42	43	42	40	43	45	49	51	53	40	Yes
RsP_C705	Participating Bung.	371663	4672858	475	T_C76	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
Rs_C709	Bungalow	372034	4669689	696	T_C74	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C710	Residence	371935	4669618	706	T_C74	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C711	Residence	371973	4669622	721	T_C74	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C713	Bungalow	372015	4672391	645	T_C76	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C716	Residence	372166	4669728	704	T_C57	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C719	Residence	372190	4669599	791	T_C57	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
Rs_C723	Bungalow	372338	4672471	606	T_C76	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C724	Bungalow	372330	4672394	594	T_C79	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C726	Bungalow	372230	4671119	402	T_C75	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C730	Residence	372269	4671105	422	T_C75	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C732	Residence	372593	4669586	671	T_C57	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C734	Residence	372663	4672386	526	T_C79	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C737	Residence	372477	4671028	569	T_C75	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
RP_C740	Participating Res.	372684	4669669	589	T_C57	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
RsP_C741	Participating Bung.	372879	4672459	610	T_C82	39	41	44	46	47	45	40	43	45	49	51	53	40	Yes
R_C742	Residence	372852	4670998	774	T_C57	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C746	Residence	373059	4669621	765	T_C57	34	35	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C749	Residence	373098	4669633	779	T_C57	34	35	38	40	41	40	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C750	Residence	373047	4669534	834	T_C57	33	35	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C752	Residence	373128	4671060	658	T_C71	38	40	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C754	Residence	372881	4670996	781	T_C57	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C757	Residence	373372	4669608	984	T_C57	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
Rs_C758	Bungalow	373387	4672407	447	T_C88	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
R_C759	Residence	373440	4671023	435	T_C71	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C761	Residence	373435	4670959	490	T_C71	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
Rs_C775	Bungalow	374140	4672361	476	T_C96	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C776	Residence	374134	4672279	559	T_C96	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
R_C784	Residence	374277	4670980	419	T_C95	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
Rs_C786	Bungalow	374497	4670950	566	T_C95	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C788	Bungalow	374339	4670892	524	T_C95	37	39	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C806	Bungalow	375169	4672111	804	T_C100	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C810	Residence	375174	4672063	785	T_C100	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
RP_C813	Participating Res.	375095	4671739	612	T_C100	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C814	Bungalow	375095	4671705	611	T_C100	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C817	Residence	375106	4671228	773	T_C100	35	37	40	42	43	41	40	43	45	49	51	53	40	Yes
R_C822	Residence	375201	4672437	600	T_C105	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C823	Residence	375199	4672412	614	T_C105	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
RP_C824	Participating Res.	375190	4672273	712	T_C105	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C825	Residence	375265	4672559	581	T_C105	37	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C829	Residence	375296	4672883	544	T_C105	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
R_C830	Residence	375324	4673042	606	T_C105	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C835	Residence	375191	4672230	748	T_C105	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C841	Residence	375184	4671198	854	T_C100	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
Rs_C851	Bungalow	376066	4672205	719	T_C69	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
Rs_C854	Bungalow	376227	4672129	662	T_C69	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C864	Residence	376607	4672169	489	T_C69	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
Rs_C869	Bungalow	376456	4672170	516	T_C69	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C873	Residence	376887	4672140	581	T_C69	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C884	Residence	377390	4672097	848	T_C123	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C911	Residence	378909	4672902	835	T_C135	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C963	Residence	368043	4673418	489	T_C40	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
Rs_C970	Bungalow	368129	4675795	604	T_C42	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C972	Residence	368119	4675498	508	T_C42	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
RP_C975	Participating Res.	368153	4675266	504	T_C41	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
Rs_C979	Bungalow	368176	4675442	449	T_C42	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C981	Residence	368197	4675791	548	T_C42	37	39	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C983	Residence	368478	4674495	501	T_C41	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
R_C991	Residence	368292	4675840	514	T_C42	37	39	42	44	45	43	40	43	45	49	51	53	40	Yes
R_C992	Residence	368569	4675930	484	T_C42	37	39	42	44	45	43	40	43	45	49	51	53	40	Yes
R_C996	Residence	369680	4675211	787	T_C66	37	39	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C997	Bungalow	369633	4675104	800	T_C66	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C998	Bungalow	369501	4675050	921	T_C66	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C1000	Bungalow	369000	4674785	472	T_C41	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C1005	Residence	369050	4673598	553	T_C49	40	42	45	47	48	46	40	43	45	49	51	53	40	Yes
RP_C1008	Participating Res.	369849	4673936	736	T_C53	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C1010	Residence	368956	4676101	731	T_C42	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C1018	Residence	370041	4673948	657	T_C65	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
Rs_C1023	Bungalow	370546	4675649	740	T_C66	36	38	41	43	44	43	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C1024	Residence	370253	4675411	515	T_C66	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
Rs_C1027	Bungalow	370553	4675564	658	T_C66	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C1029	Residence	370992	4674476	580	T_C65	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C1030	Residence	370768	4673885	520	T_C64	40	42	44	46	47	46	40	43	45	49	51	53	40	Yes
RP_C1031	Participating Res.	371216	4673871	506	T_C72	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
Rs_C1041	Bungalow	370702	4675638	774	T_C66	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
Rs_C1047	Bungalow	371275	4674618	872	T_C65	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C1049	Residence	371682	4674594	528	T_C77	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
RN_C1050	Non-residential	371624	4673900	630	T_C77	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
RP_C1051	Participating Res.	371651	4673899	609	T_C77	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
RP_C1053	Participating Res.	371626	4673615	489	T_C72	39	41	44	46	47	46	40	43	45	49	51	53	40	Yes
RsP_C1054	Participating Bung.	371626	4673582	473	T_C72	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
Rs_C1059	Bungalow	371693	4674754	625	T_C77	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
RP_C1060	Participating Res.	371746	4674341	373	T_C77	40	41	44	46	47	46	40	43	45	49	51	53	40	Yes
RsP_C1061	Participating Bung.	371764	4674369	360	T_C77	39	41	44	46	47	45	40	43	45	49	51	53	40	Yes
RP_C1063	Participating Res.	371728	4673945	521	T_C77	39	40	43	45	46	45	40	43	45	49	51	53	40	Yes
Rs_C1064	Bungalow	371708	4673555	537	T_C72	38	40	43	45	46	44	40	43	45	49	51	53	40	Yes
Rs_C1065	Bungalow	371675	4673158	449	T_C76	39	41	44	46	47	45	40	43	45	49	51	53	40	Yes
R_C1066	Residence	371844	4677618	900	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1070	Residence	371820	4677167	999	T_C80	32	33	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1071	Residence	371818	4677181	996	T_C80	32	33	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1072	Residence	371816	4677195	993	T_C80	32	33	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1073	Residence	371816	4677214	986	T_C80	32	33	36	38	39	38	40	43	45	49	51	53	40	Yes
RP_C1074	Participating Res.	371800	4674701	516	T_C77	38	39	42	44	45	44	40	43	45	49	51	53	40	Yes
R_C1079	Residence	371869	4677153	960	T_C80	32	34	36	38	39	38	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C1080	Residence	371883	4677175	938	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1081	Residence	371870	4677193	943	T_C80	32	34	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1082	Residence	371887	4677244	909	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1083	Residence	371875	4677254	917	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1084	Residence	371867	4677276	918	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1085	Residence	371876	4677301	902	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1088	Residence	371939	4677309	839	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1089	Residence	371938	4677285	847	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1090	Residence	371924	4677232	879	T_C80	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1091	Residence	371936	4677191	883	T_C80	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1092	Residence	371916	4677071	956	T_C80	32	34	37	39	40	38	40	43	45	49	51	53	40	Yes
R_C1093	Residence	371917	4677044	969	T_C80	32	34	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1094	Residence	371917	4677006	990	T_C80	32	34	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1095	Residence	371925	4676987	993	T_C80	32	34	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1098	Residence	372005	4678221	995	T_C80	32	33	36	38	39	38	40	43	45	49	51	53	40	Yes
R_C1099	Residence	371992	4677233	815	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1100	Residence	372021	4677230	790	T_C80	33	35	38	40	41	39	40	43	45	49	51	53	40	Yes
R_C1103	Residence	372028	4677108	841	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1104	Residence	372013	4677101	857	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1105	Residence	371993	4677091	880	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1106	Residence	371979	4677085	895	T_C80	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1107	Residence	372027	4677034	883	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1108	Residence	372013	4677025	900	T_C80	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1109	Residence	371990	4677023	920	T_C80	32	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1110	Residence	372063	4677250	743	T_C80	33	35	38	40	41	40	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
R_C1111	Residence	372061	4677229	754	T_C80	33	35	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C1113	Residence	372038	4677102	836	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1114	Residence	372076	4677070	822	T_C80	33	35	38	40	41	39	40	43	45	49	51	53	40	Yes
R_C1115	Residence	372040	4677042	868	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1116	Residence	372223	4675088	802	T_C77	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C1118	Residence	372232	4677155	647	T_C80	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C1119	Residence	372197	4677151	677	T_C80	34	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C1120	Residence	372178	4677135	701	T_C80	34	36	38	40	41	40	40	43	45	49	51	53	40	Yes
R_C1127	Residence	372413	4675183	938	T_C77	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C1128	Residence	372442	4675202	966	T_C77	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes
Rs_C1132	Bungalow	372468	4675112	891	T_C77	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C1133	Residence	372498	4675124	904	T_C81	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C1134	Residence	372456	4673847	561	T_C77	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
Rs_C1136	Bungalow	372724	4673828	491	T_C81	40	42	45	47	48	46	40	43	45	49	51	53	40	Yes
RP_C1137	Participating Res.	372561	4673767	568	T_C78	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
R_C1143	Residence	372309	4677190	564	T_C80	36	37	40	42	43	42	40	43	45	49	51	53	40	Yes
R_C1149	Residence	372414	4676616	992	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1157	Residence	372466	4676631	962	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1158	Residence	372465	4676614	978	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
R_C1159	Residence	372464	4676596	996	T_C80	33	34	37	39	40	39	40	43	45	49	51	53	40	Yes
Rs_C1162	Bungalow	372761	4673758	501	T_C78	40	42	45	47	48	47	40	43	45	49	51	53	40	Yes
Rs_C1164	Bungalow	372848	4677968	429	T_C80	38	40	43	45	46	45	40	43	45	49	51	53	40	Yes
R_C1165	Residence	372829	4677029	530	T_C80	37	38	41	43	44	43	40	43	45	49	51	53	40	Yes
R_C1166	Residence	372979	4676825	765	T_C80	35	36	39	41	42	41	40	43	45	49	51	53	40	Yes
R_C1167	Residence	373139	4676923	744	T_C80	35	37	40	42	43	42	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
Rs_C1168	Bungalow	372812	4676671	884	T_C80	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_C1170	Residence	373895	4675073	504	T_C94	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1171	Residence	373951	4674983	403	T_C94	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_C1172	Participating Res.	373841	4673663	440	T_C90	43	45	45	45	45	45	40	43	45	49	51	53	40	No
R_C1175	Residence	373600	4678398	415	T_C93	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_C1176	Bungalow	373572	4678391	429	T_C93	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_C1180	Bungalow	373584	4677127	792	T_C87	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1182	Residence	373893	4677192	659	T_C101	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C1184	Bungalow	373762	4677124	789	T_C101	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1185	Residence	373527	4677021	880	T_C87	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1186	Bungalow	373561	4677037	872	T_C87	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1191	Residence	374504	4675037	655	T_C94	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_C1193	Participating Res.	374441	4674966	560	T_C94	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RsP_C1195	Participating Bung.	374538	4673706	642	T_C39	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1196	Residence	374554	4673645	704	T_C108	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1200	Residence	374348	4679157	804	T_C97	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1202	Residence	374094	4679107	780	T_C97	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1205	Residence	374421	4678782	444	T_C97	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1207	Bungalow	374629	4677548	412	T_C101	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1208	Bungalow	374521	4677502	359	T_C101	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1210	Residence	374647	4674957	655	T_C39	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_C1214	Participating Res.	375006	4673605	499	T_C108	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1217	Residence	374678	4679128	860	T_C97	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1219	Residence	374814	4678917	760	T_C97	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1220	Residence	374815	4678772	662	T_C97	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
R_C1222	Residence	374764	4678761	615	T_C97	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
Rs_C1227	Bungalow	374652	4677655	521	T_C101	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C1228	Bungalow	374689	4677672	546	T_C101	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C1229	Bungalow	374691	4677704	577	T_C101	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C1230	Bungalow	374694	4677715	589	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1231	Bungalow	374738	4677693	580	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1232	Bungalow	374753	4677714	605	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1234	Bungalow	374655	4676342	474	T_C107	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1235	Residence	375104	4674995	788	T_C104	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1238	Bungalow	375361	4674965	619	T_C114	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RsP_C1240	Participating Bung.	375014	4673677	427	T_C108	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_C1241	Participating Res.	375329	4674365	345	T_C114	43	45	45	45	45	45	40	43	45	49	51	53	40	No
R_C1243	Residence	375346	4673657	507	T_C108	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1245	Residence	375462	4675407	686	T_C104	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RsP_C1246	Participating Bung.	375477	4676580	403	T_C107	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1247	Residence	375335	4677629	923	T_C101	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1251	Residence	375482	4678525	800	T_C117	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1256	Residence	375552	4676783	526	T_C107	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1257	Residence	375553	4676759	518	T_C107	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RP_C1261	Participating Res.	375981	4677693	984	T_C117	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
RP_C1262	Participating Res.	375858	4678636	417	T_C117	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RsP_C1267	Participating Bung.	376463	4674886	586	T_C121	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1272	Residence	376293	4674822	639	T_C110	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_C1276	Participating Res.	376564	4674818	639	T_C121	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_C1278	Participating Res.	376731	4674745	570	T_C119	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
R_C1283	Residence	376038	4677578	878	T_C115	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1284	Residence	376481	4677535	594	T_C115	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1288	Residence	376612	4677627	656	T_C115	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1290	Bungalow	376474	4678929	357	T_C117	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1291	Residence	376742	4678978	581	T_C117	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1293	Residence	377094	4674838	618	T_C103	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_C1294	Bungalow	377370	4674815	639	T_C128	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_C1296	Bungalow	377069	4674784	627	T_C128	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1298	Residence	377551	4674744	598	T_C131	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_C1306	Participating Res.	377420	4673423	511	T_C123	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1308	Residence	377585	4673414	567	T_C132	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1309	Residence	377176	4677500	536	T_C145	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1310	Residence	377841	4677458	535	T_C146	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1311	Residence	377875	4677435	511	T_C146	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_C1312	Bungalow	377773	4677548	632	T_C146	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1315	Bungalow	377267	4677591	646	T_C145	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1316	Bungalow	377196	4677600	637	T_C145	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1318	Bungalow	377075	4678884	526	T_C127	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1319	Bungalow	377499	4678928	391	T_C127	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1320	Residence	377118	4678960	550	T_C127	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
RsP_C1325	Participating Bung.	378149	4674749	433	T_C133	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1327	Residence	378505	4674732	419	T_C133	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_C1331	Participating Res.	377947	4674706	429	T_C131	41	43	43	43	43	43	40	43	45	49	51	53	40	No
Rs_C1332	Bungalow	377999	4674702	432	T_C131	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_C1334	Bungalow	378161	4674690	476	T_C131	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
RsP_C1335	Participating Bung.	377875	4673448	402	T_C132	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1337	Residence	378160	4673363	519	T_C132	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1341	Residence	378481	4676062	789	T_C102	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1347	Bungalow	378238	4676154	597	T_C126	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1350	Residence	378325	4677500	678	T_C102	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1352	Residence	378366	4677497	679	T_C102	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1353	Bungalow	378264	4678809	542	T_C134	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
RsP_C1356	Participating Bung.	378543	4678771	409	T_C134	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1358	Residence	378463	4678849	497	T_C134	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C1363	Bungalow	379018	4674628	505	T_C137	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RP_C1367	Participating Res.	378945	4673657	496	T_C135	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1369	Residence	378978	4673931	527	T_C136	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_C1371	Bungalow	378930	4673257	582	T_C135	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1372	Bungalow	378989	4673166	588	T_C135	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
RP_C1378	Participating Res.	379038	4673900	478	T_C136	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1382	Residence	379013	4673499	421	T_C135	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1385	Residence	378801	4677378	763	T_C102	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1388	Residence	378939	4677460	918	T_C102	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1391	Residence	379321	4678788	860	T_C134	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_C1393	Residence	378948	4678826	595	T_C134	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1397	Residence	379457	4676010	621	T_C138	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1403	Residence	379890	4674630	407	T_C137	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1405	Residence	379893	4674564	436	T_C137	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1411	Residence	379724	4673292	395	T_C135	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1413	Residence	379682	4675994	593	T_C139	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
R_C1416	Residence	379593	4676058	684	T_C138	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1420	Residence	380333	4673171	981	T_C135	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_C1427	Residence	380365	4674550	886	T_C137	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1428	Residence	380227	4674605	739	T_C137	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1442	Residence	380169	4676087	703	T_C139	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1446	Residence	380570	4675922	830	T_C139	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
RN_C1559	Non-residential	364946	4672463	414	T_C22	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_C1562	Bungalow	364503	4673351	309	T_C19	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1571	Residence	365579	4674470	826	T_C25	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
Rs_C1594	Bungalow	367427	4670181	946	T_C36	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1597	Residence	367654	4669895	925	T_C36	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1598	Residence	367684	4669888	910	T_C36	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1599	Residence	367713	4669886	893	T_C36	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1600	Residence	367739	4669890	872	T_C36	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1601	Residence	367723	4669983	814	T_C36	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1602	Residence	367807	4670072	691	T_C36	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1603	Residence	367795	4670007	748	T_C36	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1605	Residence	367805	4669879	841	T_C36	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1606	Residence	367773	4669892	850	T_C36	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1608	Residence	367868	4669969	731	T_C36	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
Rs_C1628	Bungalow	367923	4672958	721	T_C30	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
RP_C1629	Participating Res.	367927	4673142	760	T_C40	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1631	Residence	367630	4673045	677	T_C30	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1638	Residence	368151	4675202	474	T_C41	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C1653	Residence	368815	4676018	600	T_C42	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C1654	Residence	368972	4674886	412	T_C41	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_C1656	Bungalow	369303	4675070	734	T_C41	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1663	Bungalow	369985	4675382	628	T_C66	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
RN_C1704	Non-residential	373019	4676681	914	T_C80	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
Rs_C1706	Bungalow	373128	4676803	842	T_C80	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
Rs_C1708	Bungalow	373441	4676970	910	T_C80	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
Rs_C1715	Bungalow	374714	4677721	600	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1716	Bungalow	374715	4677734	613	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1717	Bungalow	374720	4677745	624	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1718	Bungalow	374721	4677755	635	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1719	Bungalow	374724	4677775	654	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1720	Bungalow	374726	4677784	664	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1721	Bungalow	374728	4677797	676	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1722	Bungalow	374734	4677831	679	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1723	Bungalow	374738	4677842	674	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1724	Bungalow	374713	4677841	659	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1725	Bungalow	374712	4677829	668	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1726	Bungalow	374710	4677819	674	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1727	Bungalow	374710	4677810	681	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1728	Bungalow	374707	4677800	674	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1729	Bungalow	374703	4677778	653	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1730	Bungalow	374701	4677757	632	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1731	Bungalow	374698	4677748	622	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1732	Bungalow	374696	4677737	610	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1733	Bungalow	374696	4677727	601	T_C101	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes

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						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
Rs_C1734	Bungalow	374738	4677856	664	T_C97	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1736	Residence	375314	4677595	887	T_C101	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
Rs_C1738	Bungalow	376825	4677520	566	T_C115	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1741	Bungalow	377229	4677745	608	T_C129	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C1825	Bungalow	378389	4678895	562	T_C134	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1827	Residence	378259	4678867	593	T_C134	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1829	Residence	377943	4678925	611	T_C127	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C1830	Residence	377931	4678901	586	T_C127	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C1834	Bungalow	377397	4678864	334	T_C127	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_C1837	Bungalow	376022	4678957	412	T_C117	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
RN_C1845	Non-residential	372116	4677327	666	T_C80	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
RN_C1846	Non-residential	372164	4677331	619	T_C80	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
RN_C1847	Non-residential	372233	4677335	553	T_C80	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1849	Residence	372100	4677116	776	T_C80	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1850	Residence	372114	4677120	762	T_C80	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1851	Residence	372131	4677124	746	T_C80	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1852	Residence	372145	4677129	732	T_C80	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
R_C1856	Residence	371820	4677252	970	T_C80	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_C1857	Residence	371844	4677250	947	T_C80	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_C1867	Residence	371955	4676991	966	T_C80	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_C1882	Residence	367934	4669717	921	T_C36	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C1885	Residence	368225	4669857	712	T_C36	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
R_C1886	Residence	368292	4669865	701	T_C36	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1887	Residence	368411	4669861	715	T_C36	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1888	Residence	368449	4669836	746	T_C36	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes

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					<=6	7	8	9	10	11	<=6	7	8	9	10	11			
R_C1889	Residence	368470	4669851	737	T_C36	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1890	Residence	368495	4669843	751	T_C36	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1895	Residence	368338	4669930	638	T_C36	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C1918	Bungalow	370368	4669812	592	T_C67	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C1921	Residence	371173	4669751	505	T_C60	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1922	Residence	371149	4669746	510	T_C60	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C1931	Residence	372731	4669667	597	T_C57	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
R_C1963	Residence	374647	4670871	728	T_C95	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
RsP_C1974	Participating Bung.	370480	4671240	356	T_C63	41	43	43	43	43	43	40	43	45	49	51	53	40	No
RsP_C1983	Participating Bung.	370088	4672558	680	T_C53	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_C2000	Residence	375199	4672267	723	T_C105	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C2005	Residence	375254	4673301	683	T_C105	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C2014	Bungalow	369949	4674098	607	T_C65	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_C2029	Bungalow	373894	4675870	514	T_C99	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C2034	Residence	376303	4676441	595	T_C111	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RN_C2038	Non-residential	380391	4676092	820	T_C139	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
RP_C2111	Participating Res.	371771	4674325	346	T_C77	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_C2123	Residence	372319	4673868	471	T_C77	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RsP_C2140	Participating Bung.	376972	4673434	449	T_C118	41	43	43	43	43	43	40	43	45	49	51	53	40	No
Rs_C2144	Bungalow	378331	4673458	534	T_C132	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_C2147	Bungalow	378921	4673306	567	T_C135	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
Rs_C2150	Bungalow	380056	4673283	683	T_C135	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
Rs_C2152	Bungalow	380094	4673204	751	T_C135	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C2164	Residence	377622	4672017	986	T_C123	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_C2170	Residence	375452	4676191	530	T_C107	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes

Point of Reception ID	Receptor Description			Distance to nearest Wind Turbine (m)	Turbine ID	Calculated Sound Pressure Level (dBA) at selected Windspeeds (m/s)						Sound Level Limits (dBA) at Selected Windspeeds (m/s)						Background Level NPC 232	Compliance with Limit (Yes/No)
						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
Rs_C2179	Bungalow	377258	4674844	644	T_C103	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_C2183	Bungalow	379108	4674823	402	T_C137	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_C2187	Residence	380156	4674518	695	T_C137	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_C2204	Residence	366253	4675678	821	T_C35	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
Rs_C2311	Bungalow	375778	4673529	568	T_C112	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RP_G2	Participating Res.	360045	4667818	520	T_G50	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RsP_G11	Participating Bung.	359945	4669223	999	T_G59	32	34	34	34	34	34	40	43	45	49	51	53	40	Yes
R_G13	Residence	357951	4667923	560	T_G22	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RsP_G15	Participating Bung.	359011	4663101	465	T_G7	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
RsP_G20	Participating Bung.	359047	4663506	731	T_G69	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes
RP_G24	Participating Res.	361293	4663603	560	T_G2	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_G30	Bungalow	361940	4666295	370	T_G44	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RsP_G31	Participating Bung.	362326	4666290	613	T_G44	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_G32	Residence	362536	4664900	626	T_G36	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_G39	Bungalow	359250	4665185	690	T_G14	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RsP_G40	Participating Bung.	358808	4665228	598	T_G15	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_G42	Bungalow	358395	4666637	564	T_G48	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_G45	Bungalow	358601	4666639	536	T_G48	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_G47	Bungalow	358738	4666607	592	T_G48	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_G49	Bungalow	358895	4666610	652	T_G48	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_G50	Participating Res.	358910	4666491	643	T_G32	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RsP_G58	Participating Bung.	359368	4666562	701	T_G46	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_G59	Participating Res.	359438	4666457	591	T_G39	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_G68	Residence	361327	4667745	865	T_G55	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
RsP_G72	Participating Bung.	361372	4667743	822	T_G55	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes

Point of Reception ID	Receptor Description			Distance to nearest Wind Turbine (m)	Turbine ID	Calculated Sound Pressure Level (dBA) at selected Windspeeds (m/s)						Sound Level Limits (dBA) at Selected Windspeeds (m/s)						Background Level NPC 232	Compliance with Limit (Yes/No)
						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
RsP_G74	Participating Bung.	358948	4667866	454	T_G57	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_G75	Residence	357892	4669362	544	T_G24	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_G76	Residence	358044	4669355	435	T_G24	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_G79	Residence	358639	4669317	457	T_G24	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_G82	Residence	358914	4669299	398	T_G59	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_G85	Participating Res.	359105	4667945	353	T_G57	42	44	44	44	44	44	40	43	45	49	51	53	40	No
R_G86	Residence	359841	4669241	907	T_G59	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
Rs_G110	Bungalow	357600	4668061	578	T_G22	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RP_G113	Participating Res.	357909	4668021	469	T_G22	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_G115	Residence	361391	4667819	840	T_G55	34	36	36	36	36	36	40	43	45	49	51	53	40	Yes
Rs_G118	Bungalow	359442	4667946	498	T_G57	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_G125	Participating Res.	362172	4667755	365	T_G55	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_G126	Bungalow	360671	4667944	928	T_G50	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
Rs_G128	Bungalow	358364	4668003	603	T_G22	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_G131	Bungalow	358537	4667986	634	T_G57	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_G132	Residence	358405	4667934	682	T_G22	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_G133	Bungalow	358558	4667922	651	T_G57	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_G134	Residence	358649	4667909	588	T_G57	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_G136	Participating Res.	359134	4667887	413	T_G57	41	43	43	43	43	43	40	43	45	49	51	53	40	No
RP_G137	Participating Res.	359440	4667859	562	T_G57	41	43	43	43	43	43	40	43	45	49	51	53	40	No
Rs_G139	Bungalow	359382	4667859	528	T_G57	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_G141	Residence	361493	4667806	747	T_G55	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
RsP_G145	Participating Bung.	359640	4666535	635	T_G40	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_G146	Participating Res.	359690	4666535	624	T_G40	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_G147	Bungalow	360306	4667802	587	T_G50	36	38	38	38	38	38	40	43	45	49	51	53	40	Yes

Point of Reception ID	Receptor Description			Distance to nearest Wind Turbine (m)	Turbine ID	Calculated Sound Pressure Level (dBA) at selected Windspeeds (m/s)						Sound Level Limits (dBA) at Selected Windspeeds (m/s)						Background Level NPC 232	Compliance with Limit (Yes/No)
						<=6	7	8	9	10	11	<=6	7	8	9	10	11		
R_G149	Residence	361866	4667779	459	T_G55	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RsP_G151	Participating Bung.	360520	4667695	652	T_G50	35	37	37	37	37	37	40	43	45	49	51	53	40	Yes
Rs_G153	Bungalow	361441	4667807	791	T_G55	33	35	35	35	35	35	40	43	45	49	51	53	40	Yes
R_G156	Residence	361679	4667727	549	T_G55	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_G158	Residence	361840	4667717	424	T_G55	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RsP_G160	Participating Bung.	356862	4667606	348	T_G70	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
Rs_G162	Bungalow	362221	4666370	585	T_G44	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_G163	Bungalow	360439	4667559	508	T_G50	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
Rs_G164	Bungalow	360431	4667373	434	T_G50	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
Rs_G165	Bungalow	356849	4667415	364	T_G70	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
RP_G167	Participating Res.	360479	4667300	476	T_G50	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
R_G168	Residence	360376	4666643	754	T_G50	38	40	40	40	40	40	40	43	45	49	51	53	40	Yes
RP_G178	Participating Res.	359312	4666559	702	T_G46	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
R_G183	Residence	360652	4666472	899	T_G41	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_G186	Residence	360724	4666464	877	T_G41	37	39	39	39	39	39	40	43	45	49	51	53	40	Yes
R_G189	Residence	361798	4666401	457	T_G44	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
RP_G193	Participating Res.	361837	4666403	458	T_G44	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes
Rs_G194	Bungalow	357743	4666698	530	T_G20	39	41	41	41	41	41	40	43	45	49	51	53	40	Yes
R_G195	Residence	358137	4666653	597	T_G65	40	42	42	42	42	42	40	43	45	49	51	53	40	Yes

6.0 CONCLUSION

A baseline ambient sound survey was conducted for the wind plant siting area to substantiate the regulatory sound level limit requirements for the Project. The noise data collected during the long-term monitoring period was subsequently used to compare the existing ambient noise levels to the sound level limit requirements as defined in the MOE Interpretation. While a Class 2 (urban) area was delineated with the site data, for conservancy in interpreting the model results, the entire study area was designated Class 3 (rural) for the purposes of the ENIA.

Building upon the project specific sound limit guidelines, noise impact prediction modelling was undertaken. The noise impact from the Project's wind turbine array, coupled with transformers with an acoustical barriers, tonality penalty, and operating at maximum rated power, on the nearest points of reception was predicted using an acoustic model, ISO 9613, as required by the MOE.

The analysis shows that the cumulative noise impact from the Project does not exceed the most restrictive night-time noise limits that apply for areas with an acoustic designation of Class 3 (Rural) as defined by the MOE. Consequently, there is no need for the application of any additional mitigation measures and no further studies are contemplated for environmental noise in relation to the Project.

Finally, although not known at the time of writing, Brookfield may perform blasting operations during construction of the Project. Noise and vibration levels from blasting shall meet the MOE guidelines outlined in MOE publication NPC 119.

7.0 REFERENCES:

1. *Infrasound Emission from Wind Turbines*, Jorgen Jakobsen, Danish Environmental Protection Agency, 17 Aug 2005
2. *Infrasound from Wind Turbines-Fact, Fiction or Deception*, Geoff Leventhall, Journal of Canadian Acoustical Association, 2006
3. *NPC-102 – Instrumentation*, Ontario Ministry of Environment
4. *NPC-103 – Procedures*, Ontario Ministry of Environment
5. *NPC-104 – Sound Level Adjustments*, Ontario Ministry of Environment
6. *NPC-205 – Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)*, Ontario Ministry of Environment
7. *NPC-206 – Sound Levels due to Road Traffic*, Ontario Ministry of Environment
8. *NPC-232 – Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)*, Ontario Ministry of Environment
9. *NPC-233 – Information to be Submitted for Approval of Stationary Sources of Sound*, Ontario Ministry of Environment
10. *IEC 61400-11- “Wind turbine generator systems – Part 11: Acoustic noise measurement techniques – International Restrictions”*, Dec. 2002
11. *ISO-9613-2 – “Acoustics – Attenuation of sound propagation outdoors – Part 2: General method of calculation”*, Dec. 1996
12. *ETSU-R-97 – “The Assessment and Rating of Noise from Wind Farms”*, Final Report, September 1996.
13. *IEEE C57.12.90-1993 – Part I: IEEE Standard Test Code for Liquid – Immersed, Distribution, Power, and Regulating Transformers*
14. *CAN/CSA-C88-M90 – Power Transformers and Reactors – Electrical Power Systems and Equipment – A National Standard of Canada (Reaffirmed 2004)*