Appendix D.4 Noise Assessment

Environmental Review Report

York Energy Centre Upgrades Project

Capital Power Corporation

SLR Project No.: 241.030524.00026

July 2024

Noise Assessment

York Energy Centre Upgrades Project

Capital Power Corporation

1200-10423, 101 St. N.W. Edmonton AB T5H 0E9

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SLR Project No.: 241.030524.00026

July 2024

Revision: 0

Revision Record

Revision	Date	Revision Description
0	July 2024	Report issued for public review

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Acronyms and Abbreviations

%	percent
AAR	Acoustic Assessment Report
ATEP	Advanced Turbine Efficiency Package
Capital Power	Capital Power Corporation
DAIS	Direct Air Injection System
dB	decibel
dBA	a-weighted decibel
dBAI	impulsive a-weighted decibel
Dillon	Dillon Consulting Limited
ECA	Environmental Compliance Approval
EPA	*Environmental Protection Act*
ERR	Environmental Review Report
ESP	Environmental Screening Process
GE	General Electric
GTG	Gas Turbine Generators
ha	hectare
Hz	hertz
IESO	Independent Electricity System Operator
ISO	International Organization for Standardization
L_{eq}	equivalent sound level
L_{LM}	Logarithmic Mean Impulse Sound Level
M	metres
MECP	Ministry of the Environment, Conservation and Parks
MW	megawatt
NPC	Noise Pollution Control
OPOR	outdoor point of reception
POR	Point of reception
SLR	SLR Consulting (Canada) Ltd.
SSPA	Site Specific Policy Area
SWM	Stormwater Management
YEC	York Energy Centre

1.0 Introduction

1.1 Project Overview

Capital Power Corporation (Capital Power), through its affiliate York Energy Centre LP., owns and operates the York Energy Centre (YEC). The YEC is a natural gas-fired, simple cycle, peaking generation power plant that generates an average gross output of 425 megawatts (MW) of electrical power. The YEC has been in operation since 2012, and since April of 2017, has been owned and operated by Capital Power. The YEC is located on two parcels of land, municipally known as 18781 and 18765 Dufferin Street located in the Township of King, Regional Municipality of York, hereafter referred to as the YEC Property (**Figure 1-1**).

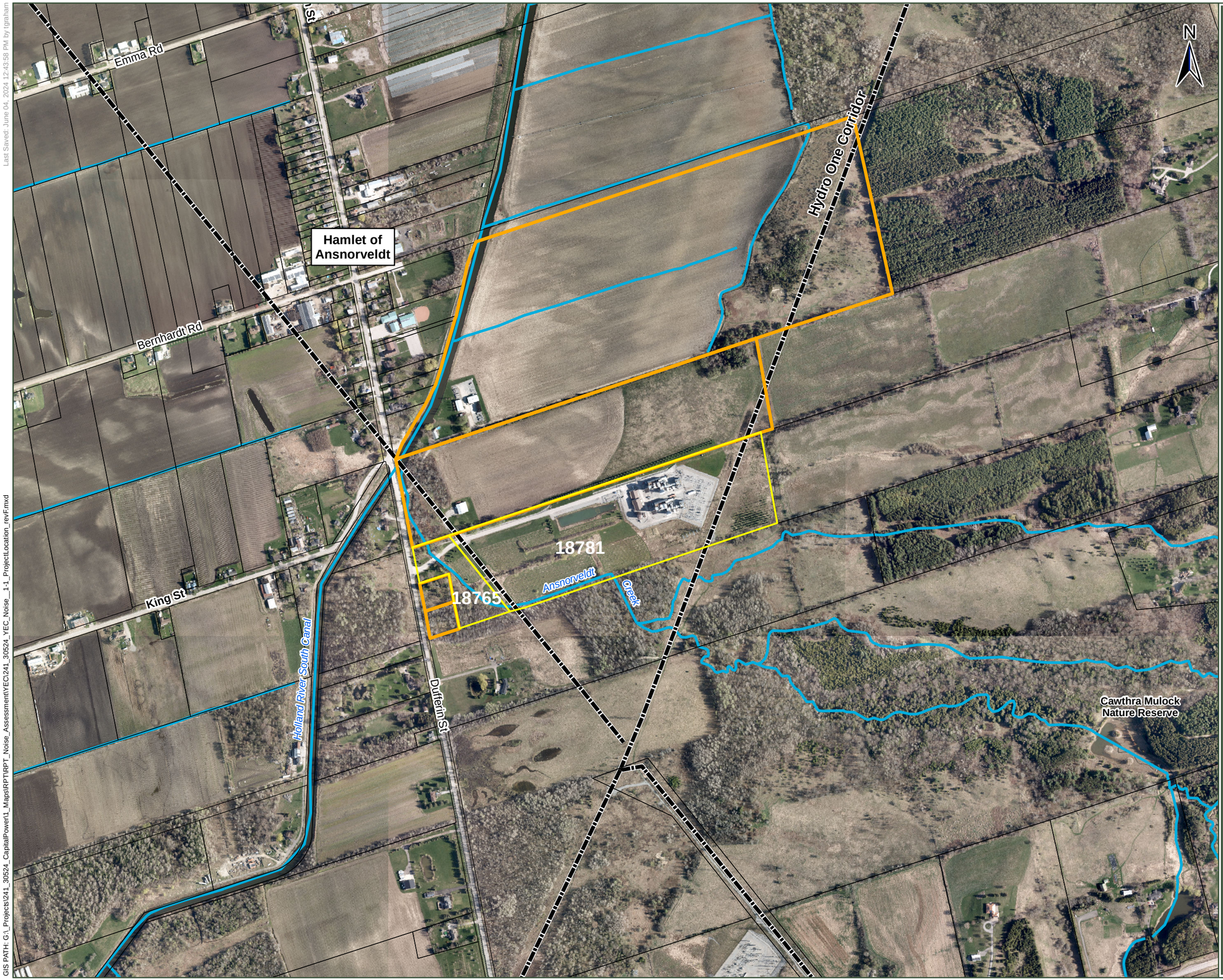
Capital Power is proposing equipment upgrades at the YEC, referred to as the YEC Upgrades Project (the Project). The Project will provide approximately 30 MW of additional electricity generating capacity compared to current operations, which is reflective of an approximate 7.0 percent (%) increase in generating capacity. The proposed modifications of the YEC include:

- installation of a turbine upgrade package that will increase operational performance and reduce emissions of nitrogen oxides (NO_x);
- installation of an inlet fogging system;
- installation of larger transformer cooling fans; and
- adjustments to control logic.

The Project will result in improved efficiency, increased generation capacity and reduced NO_x emissions at the YEC. Installation of the upgrades will not result in changes to the footprint of the existing YEC, and there will be no changes to current use or maintenance practices at the facility. Installation of the upgrades will consist of component delivery, installation, and performance testing. Limited ground disturbance will be required within the footprint of the existing facility pad, and no construction work will occur within undisturbed or naturalized areas.

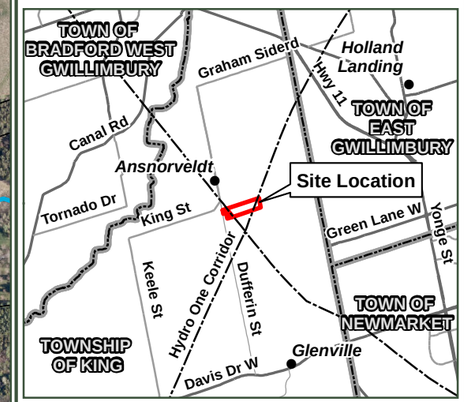
1.2 Objective

The objective of this Noise Assessment Report is to predict sound level emissions associated with the Project and to assess potential noise-related effects of the Project on local receptors. The assessment will additionally evaluate the Project for compliance with applicable provincial regulatory limits. This report has been prepared in support of the Environmental Review Report (ERR) to meet the requirements of the Environmental Screening Process for Electricity Projects (ESP).



LEGEND:

- YEC Property
- Other CPC Owned Properties
- Parcel Fabric
- Watercourse/Drainage Feature
- Existing Utility Line



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YEC UPGRADES PROJECT

NOISE ASSESSMENT

PROJECT LOCATION

SLR

FIGURE NO:
1-1

DATE: July 2024

PROJECT NO: 241.30524.00026

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2.0 Project and Site Context

2.1 Site Context

The YEC is located on two parcels, municipally known as 18781 and 18765 Dufferin Street, in the Township of King, Regional Municipality of York, just south of the Hamlet of Ansnorveldt and the Holland River. The generally rectangular property is approximately 15.3 hectares (ha) in size with approximately 80 metres (m) of frontage along Dufferin Street, and an approximate depth of 810 m. Located slightly east of the centre of the property is the main power generation facility and all of the associated infrastructure features including internal access roads and parking lots, high voltage substation and overhead transmission line for grid interconnection, natural gas supply and storage infrastructure, and stormwater management features. The remainder of the property predominantly features mowed lawn and open field areas. Ansnorveldt Creek extends along the south property line, intersecting the southwest portion of the property to feed into the Holland River South Canal located generally west of the YEC. The YEC's main site entrance is located in the northwest corner of the property. **Figure 2-1** provides context related to the location of the existing YEC and associated site features.

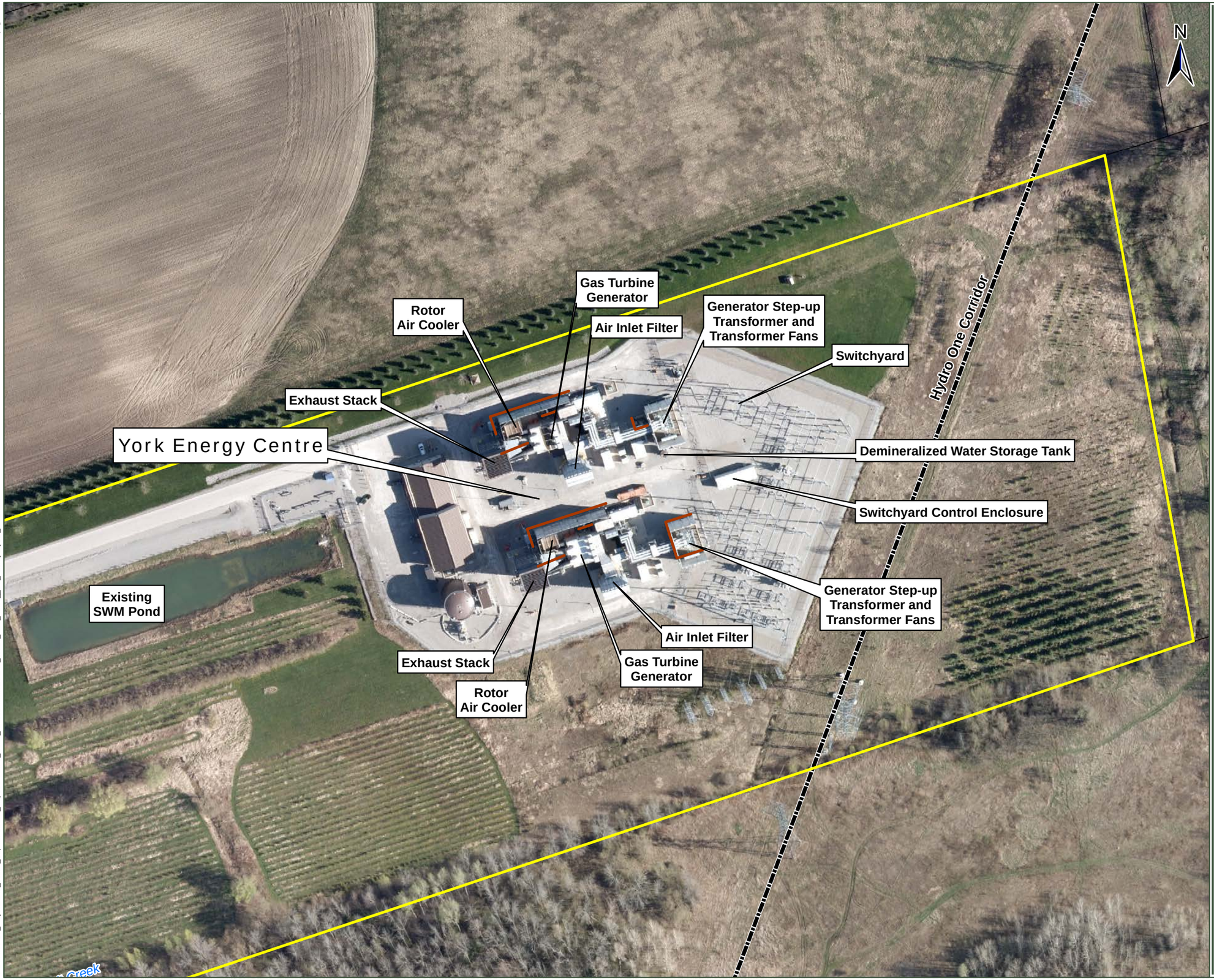
The YEC Property is exempt from the *Planning Act* as specified in Ontario Regulation 305/10 and is identified as a Countryside Site Specific Policy Area (C-SSPA-3) in the Township of King Official Plan. The YEC Property is not subject to the provisions of the Zoning Bylaw but is identified for descriptive purposes (**Appendix A**). Land use within approximately 500 m of the existing YEC include approximately 25 residences along Dufferin Street south of Bernhardt Road. Commercial and institutional land uses include the Ansnorveldt Public Library, Holland Marsh Christian Reformed Church, and several small businesses including King Firewood and Lonelm Construction Company (YorkMaps 2023 and Google Maps 2024). Other land uses include agriculture, the Cawthra Mulock Nature Reserve south of the YEC Property, and two Hydro One transmission lines bisecting the YEC Property.

2.2 YEC Context

The existing YEC has been in operation since 2012. It is a natural gas-fired, simple cycle, peaking generation power facility that primarily operates during intermediate and peak demand periods. The existing YEC consists of two combustion gas turbines and one standby diesel generator and is equipped with emission control/reduction technologies including Ultra Low NOx combustors for the gas turbines. The YEC uses a Continuous Emissions Monitoring System (CEMS) to monitor emissions for compliance with regulatory limits.

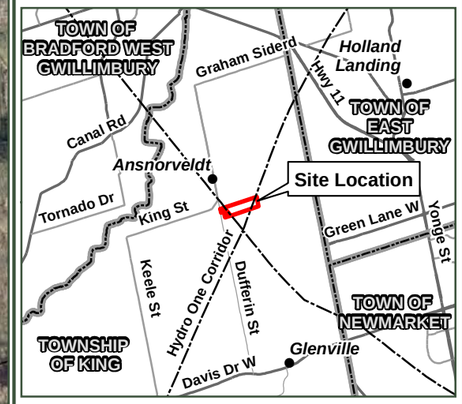
As a peaking facility, the YEC is dispatched by the IESO only when there is high (peak) demand for electricity or as a result of sudden system disturbances. Capable of coming online in under 30 minutes, the YEC has historically been dispatched to provide grid stability and power while other baseload facilities come online. Over the past five years, the YEC has been dispatched by the IESO an average of 146 hours annually, with an average run time of just under 3 hours per dispatch request. As a peaking facility, the YEC must operate for less than 1,500 hours annually.

The YEC operates in accordance with the facility's existing Environmental Compliance Approval (ECA) (Air & Noise) issued by the Ministry of the Environment, Conservation and Parks (MECP). The original YEC ECA was issued in March 2010 and has subsequently been amended, with the current version of ECA 7348-83GSVK issued in July 2014. The YEC's plant control and operation systems are currently programmed to limit each turbine's gross output in order to maintain compliance with the output value included in the facility's ECA.



LEGEND:

- YEC Property
- Parcel Fabric
- Existing Utility Line
- Existing Barrier



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YEC UPGRADES PROJECT

NOISE ASSESSMENT

EXISTING YEC FACILITY LAYOUT

SLR

FIGURE NO:
2-1

DATE: July 2024

PROJECT NO: 241.V30524.00026

2.3 Project Context

The proposed modifications of the YEC include installation of a turbine upgrade package, an inlet fogging system, larger transformer cooling fans, and adjustments to control logic. These modifications are summarized below.

- **Turbine Upgrades:** Both of the existing gas turbines will be modified through the installation of an upgrade package offered and installed by the turbine manufacturer, Siemens Energy (SE). The upgrade package includes three distinct modifications:
    - *Advanced Turbine Efficiency Package (ATEP):* this performance upgrade will improve power turbine aerodynamics, provide more efficient use of cooling and sealing air flows in the turbine section, and use improved thermal barrier coatings and manufacturing technologies for the hot-gas-path components, resulting in improved efficiency and power output of the units. The turbine upgrade will provide an increased YEC capacity and improve the heat rate by upwards of 4%. This realised improvement will result in an increase in the thermal efficiency of each turbine unit, which in turn will result in an improved carbon dioxide emission factor (CO_2e)/MW.
    - *Ultra-Low NO_X Combustion System (ULN 3.0):* this upgrade will replace the existing ULN 2.0 system which will result in an improvement of the emissions performance of the YEC. Design changes in the combustor pilot control of the ULN 3.0 allows finer tuning of the equipment which results in lower emissions, increased stability/control at higher loads.
    - *Direct Air Injection System (DAIS):* this modification will pump compressed air into the turbine during shutdown to help equalize the temperature and prevent turbine damage from occurring.
- **Inlet Fogging:** An inlet fogging power augmentation system will be installed to cool intake air entering each of the existing turbines. The cooling of the intake air prevents a decrease in power during times of higher ambient air temperature, which results in optimal power generation for both turbines.
- **Transformer Cooling Fans:** The existing transformer cooling fans need to be replaced with larger fans to accommodate the additional power generated from the upgraded YEC. The fans themselves aid in cooling of the transformer.
- **Gas Turbine Control Updates:** Control logic limitations currently in place at the YEC to limit each turbine's gross output would be removed to allow the upgraded YEC equipment to operate at the designed maximum gross output.

The upgrades to the YEC will not materially change how the facility is dispatched by the IESO as a peaking power plant. The YEC is expected to continue to run infrequently and below the regulated 1,500-hour annual limit for peaking facilities. Dispatch forecasting suggests that the facility may run less than 180 hours annually, while 2027 would see the largest number of operating hours at approximately 260.

3.0 Regulatory Framework

Ontario's *Environmental Protection Act* (EPA) is the primary provincial legislative framework for regulation of noise emissions from industrial facilities, including operational noise from natural gas generation facilities such as the Project. The MECP administers the EPA and is the key regulatory authority for establishing applicable noise limits, reviewing applications for approvals under the EPA, and for overseeing issues of compliance. Following completion of the Environmental Screening Process (ESP), the Project will require an amendment to the existing ECA (Air and Noise), issued under the EPA, and must operate within the provincially regulated noise limits.

Current MECP noise guidelines for stationary source noise (such as those from the Project) having the potential of impacting surrounding noise sensitive uses are given in MECP Publication Noise Pollution Control (NPC)-300[1].

The applicable portions of NPC-300 are Part B – Stationary Sources and the associated definitions outlined in Part A Background.

The guidelines set out sound level limits for two main types of noise sources:

- Non-impulsive, "continuous" noise source such as from ventilation fans, mechanical equipment, and vehicles moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound levels (L_{eq} (1-hr) values), in dBA; and
- Impulsive noise, which is a "banging" type noise characterized by rapid rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (L_{LM}) of the impulses in a one-hour period, in dBAI.

The area surrounding the Project Site is defined as Class 3 rural, as per MECP Publication NPC-300. This Publication describes a Class 3 Area as "area with an acoustical environment that is dominated by natural sounds having little to no road traffic".

4.0 Methods

4.1 Source Sound Level Data

A Noise Audit of the operating YEC was completed by Aiolos in 2012. No major upgrades or new sources of sound have been installed at the YEC Property since completion of the audit, and therefore, the data provided in the 2012 Aiolos Report is considered representative of the current configuration of the YEC. Sound levels for the existing YEC equipment were referenced using a combination of source data found in the 2012 Audit Report, as well as the June 2011 Acoustic Assessment Report (AAR) completed for the YEC in support of the original ECA application (Dillon Consulting Ltd., 2011). Sound levels for the new Project equipment were obtained through a combination of manufacturer's guarantees and engineering calculations based on similar equipment.

[1] A June 2011 Acoustic Assessment Report (AAR) was completed for the YEC in support of the original ECA application (Dillon Consulting Ltd., 2011). The 2011 AAR utilized MECP Publications NPC-205 and NPC-232 that were in effect at the time; MECP NPC-300 has since superseded these documents. The changes between these publications as they relate to this assessment are considered minimal.

The existing YEC and Project do not and will not contain any impulsive sources for assessment that would be audible at the surrounding noise sensitive receptors. Impulse noise was thus not carried further in the assessment.

The noise source sound power levels used in this assessment are summarized in **Appendix B**.

4.1.1 Existing YEC Emission Sources

The current noise sources at the existing YEC are based on the 2012 Noise Audit Report completed by Aiolos, which include:

- Two (2) Siemens SGT6-5000F gas turbine generator sets and related equipment;
- Two (2) step-up plant transformers; and
- Emergency diesel generator set.

The dominant noise sources at YEC are listed in **Appendix B**. This contains a listing of noise source sound power levels, sound characteristics, locations, and a summary of any noise abatement measures that may have been implemented.

4.1.2 Project Emission Sources

The potential noise sources for the Project include:

- Turbine upgrades (ATEP, ULN 3.0, and DAIS);
- Inlet fogging;
- Step-up transformer cooling fan upgrades; and
- Gas Turbine Control Logic Updates.

4.2 Points of Reception

A total of five representative (façade of building) Points of Reception (PORs) have been identified as being representative of the most sensitive receptors in the vicinity of the Project Site, labelled R1, R2, R3, R7 and R9 in **Figure 4-1**. POR (façade) locations are consistent with locations used in the 2012 Noise Audit Report completed by Aiolos of the YEC. Assessment of Outdoor Points of Reception (OPOR) were not required as part of the previous MECP NPC-232 guidelines and therefore were not included in the 2011 AAR. Although sound levels at the OPORs are not documented in the 2011 AAR, the predicted sound level at the POR and OPORs for most receptors would be approximately the same.

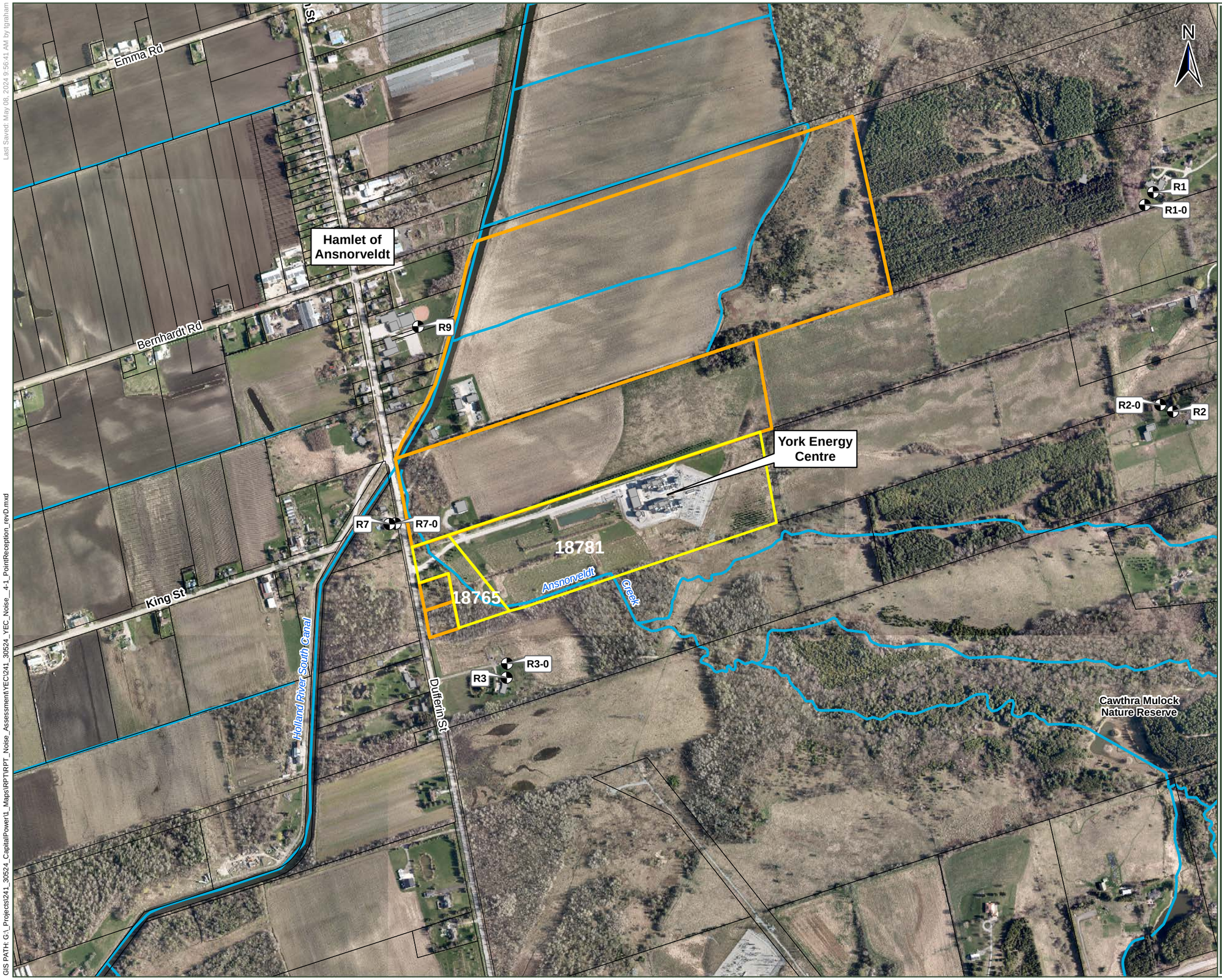
As per MECP noise guidelines, “Point of reception” means any point on the premises of a person where sound or vibration originating from other than those premises is received. For the purpose of an ECA (Air and Noise) amendment application, the points with “the predictable worst case noise impacts” must be considered in accordance with the MECP noise guidelines.

For the (façade) PORs, the receptor location is shown in **Figure 4-1**.

The PORs shown in **Figure 4-1**.are summarized below.

- R1: is a two-storey senior residence at 18868 Bathurst Street located approximately 930 m east of the site.
- R2: is a two-storey residential dwelling at 18660 Bathurst Street located approximately 885 m east of the site.

- R3: is a split-level residential dwelling at 18665 Dufferin Street located approximately 345 m south of the site.
- R4 to R6 are representative of lands included in previous assessments, these lands have since been purchased by Capital Power and repurposed. Therefore, assessment of these lands is not required.
- R7: is a two-storey residential dwelling at 18800 Dufferin Street located approximately 40 m west of the site.
- R8: is a two-storey residential dwelling at 18855 Dufferin Street located approximately 20 m north of the site. These lands have recently been purchased by Capital Power and will be repurposed as non noise sensitive uses. Therefore, assessment of this land is not required.
- R9: is a single-storey school/place of worship at 18955 Dufferin Street located approximately 250 m north of the site.



LEGEND:

- YEC Property
- Other CPC Owned Properties
- Parcel Fabric
- Watercourse/Drainage Feature
- Receptor
- Existing Building

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THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY
AND SHOULD NOT BE USED FOR NAVIGATION

YEC UPGRADES PROJECT

NOISE ASSESSMENT

SCALED AREA LOCATION PLAN, SHOWING MODELLED POINTS OF RECEPTION

SLR

FIGURE NO:
4-1

DATE: July 2024

PROJECT NO: 241.30524.00026

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4.3 Existing Ambient Sound Levels and Limits

The MECP-accepted method of determining the applicable sound level limits at a surrounding noise sensitive POR is to identify and use the higher of:

- The existing ambient sound level due to road traffic; or
- The exclusion limits set out in the guideline.

Ambient sound levels surrounding the existing YEC were previously assessed in the 2012 Noise Audit Report completed by Aiolos and utilized the exclusion limits outlined in MECP NPC-232. NPC-300 and NPC-232 have the same sound level limits, therefore NPC-300 will only be referenced below. These limits are presented in **Table 4-1**.

Table 4-1: MECP NPC-300 Applicable Sound Level Limits

Time of Day	Exclusionary Limit (dBA)
Day (7am to 7pm)	45
Evening (7pm to 11pm)	40
Night (11pm to 7am)	40

4.4 Modelling Scenario

Only the Regular Operations including all equipment operating simultaneously (excluding emergency equipment) has been assessed, consistent with the 2012 Noise Audit Report completed by Aiolos as described in **Section 4.6**. Start-up and Shutdown conditions occur fairly quickly, and the sound levels do not vary much from Regular Operations. Regular Operations for the existing YEC were predicted to not vary by time of day, as outlined in the 2012 Noise Audit Report completed by Aiolos.

The Project is not planned to modify any sound sources relating to emergency equipment. As a result, a change assessment has not been completed for the “Testing of Emergency Diesel Generator” scenario since the Project and existing YEC noise will be the same and compliant with the applicable sound level limits.

To evaluate the change in noise levels from implementation of the Project, three operating scenarios have been modelled; Existing YEC Predicted Sound Levels, Project Predicted Sound Levels, and Combined Predicted Sound Levels.

4.5 Noise Impact Modelling

The Project’s modelled noise impacts were calculated using Cadna/A, a prediction software consistent with the International Organization for Standardization (ISO) 9613-2 standard. The model took into consideration the layout of the Project Site, the location of the sources, and the surrounding buildings. As described in ISO 9613-2, ground factor values that represent the effect of ground absorption on sound levels range between 0 and 1. A range of ground absorptions were used in the modelling to account acoustically for both soft (grass and trees) and hard surfaces. Building reflections have been included (reflection order = 2), with a building absorption coefficient of 0.37 used.

4.6 Modelling Accuracy

The accuracy of the predicted Cadna/A model depends on several factors such as:

- YEC existing sound levels used for the purposes of this assessment were taken directly from the June 2012 Noise Audit Report completed by Aiolos. The sound levels reported in the Audit, were directly established to be existing YEC sound levels.
- The Project sound levels were obtained through a combination of manufacturer's guarantees and engineering calculations (based on similar equipment). Manufacturer's guarantees are generally equal to or higher than the installed sound levels. Engineering calculations are based on similar equipment and anticipated to be higher than actual values. Therefore, the Project modelled sound levels are expected to be conservative.

5.0 Results

The sound levels for Regular Operations at the YEC, as documented in the 2012 Audit Report presented in **Table 5-1**, and demonstrated that the existing YEC sound levels were measured to meet the applicable MECP sound level limits.

Table 5-1: Existing YEC Regular Operations Predicted Sound Level at POR Facades

Façade Point of Reception ID	Point of Reception Description	Time of Day	YEC Sound Level at POR (L_{eq} dBA)	Most Stringent Performance Limit (L_{eq} dBA)	Compliance with Limit (yes/no)
Regular Operations					
R1	18868 Bathurst Street	All periods	36	40	yes
R2	18660 Bathurst Street	All periods	37	40	yes
R3	18665 Dufferin Street	All periods	40[1]	40	yes
R7	18800 Dufferin Street	All periods	36	40	yes
R9	18955 Dufferin Street	All periods	39	40	yes

[1] Results were not provided in the 2012 Audit report for R3, as access was denied to the property. The June 2011 Dillon AAR number has been used for this assessment.

The predicted change in sound levels due to the Project are as follows:

- The manufacturer's supplied sound level change for the combined effects of turbine upgrades, inlet fogging, and gas turbine control updates are to be at most, a 2 dB increase in the octave bands below 150 Hz for sound levels emitted from the combustion exhaust stacks. The resulting overall A-weighted sound level would be minimally increased. This change will have negligible change to the existing YEC sound levels.
- The proposed transformer fan sound levels are to be lower or equal to the currently installed fans on both step-up transformers. This is to result in a decrease or equal sound level for each unit. To be conservative, no change in sound level is anticipated.

The Project is anticipated to have a negligible change in noise emissions at sensitive receptors when compared to the current operations at the YEC (Table 5-1). Following implementation of the Project, the upgraded YEC would continue to meet the applicable MECP Publication NPC-300 sound level limits during normal operations.

Table 5-2: Combined Predicted Regular Operations Sound Levels at POR Façade

Façade Point of Reception ID	Point of Reception Description	Time of Day	YEC Sound Level at POR (L_{eq} dBA)	Project Sound Level at POR (L_{eq} dBA)	Combined (Project + existing YEC) Sound Level at POR (L_{eq} dBA)	Most Stringent Performance Limit[1] (L_{eq} dBA)	Compliance with Limit (yes/no)
Regular Operations							
R1	18868 Bathurst Street	All periods	36	--	36	40	yes
R2	18660 Bathurst Street	All periods	37	--	37	40	yes
R3	18665 Dufferin Street	All periods	40[2]	--	40	40	yes
R7	18800 Dufferin Street	All periods	36	--	36	40	yes
R9	18955 Dufferin Street	All periods	39	--	39	40	yes

[1] As shown in Table 4-1, MECP NPC-300 applicable sound level limits differ throughout the day; Day (45 dBA) vs. Evening and Night (40 dBA). As YEC can operate during any time of the day, the most restrictive performance limit, 40 dBA, was applied to all modelling scenarios.

[2] Results were not provided in the 2012 Audit report for R3, as access was denied to the property. The June 2011 Dillon AAR number has been used for this assessment.

6.0 Summary of Findings

The Project would result in a negligible increase to the existing sound level at representative local receptors. Following implementation of the Project, the upgraded YEC would continue to meet the applicable MECP Publication NPC-300 sound level limits during normal operations.

SLR Consulting (Canada) Ltd.

Dylan Diebolt, B.Sc.
Acoustical Consultant

Aaron Haniff, P.Eng.
Principal Acoustical Engineer

7.0 References

Dillon Consulting Inc. 2021. East Windsor Cogeneration Inc. Updated Acoustic Assessment Report. Windsor, Ontario N8W 5K8.

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Appendix A Land-Use Zoning Maps

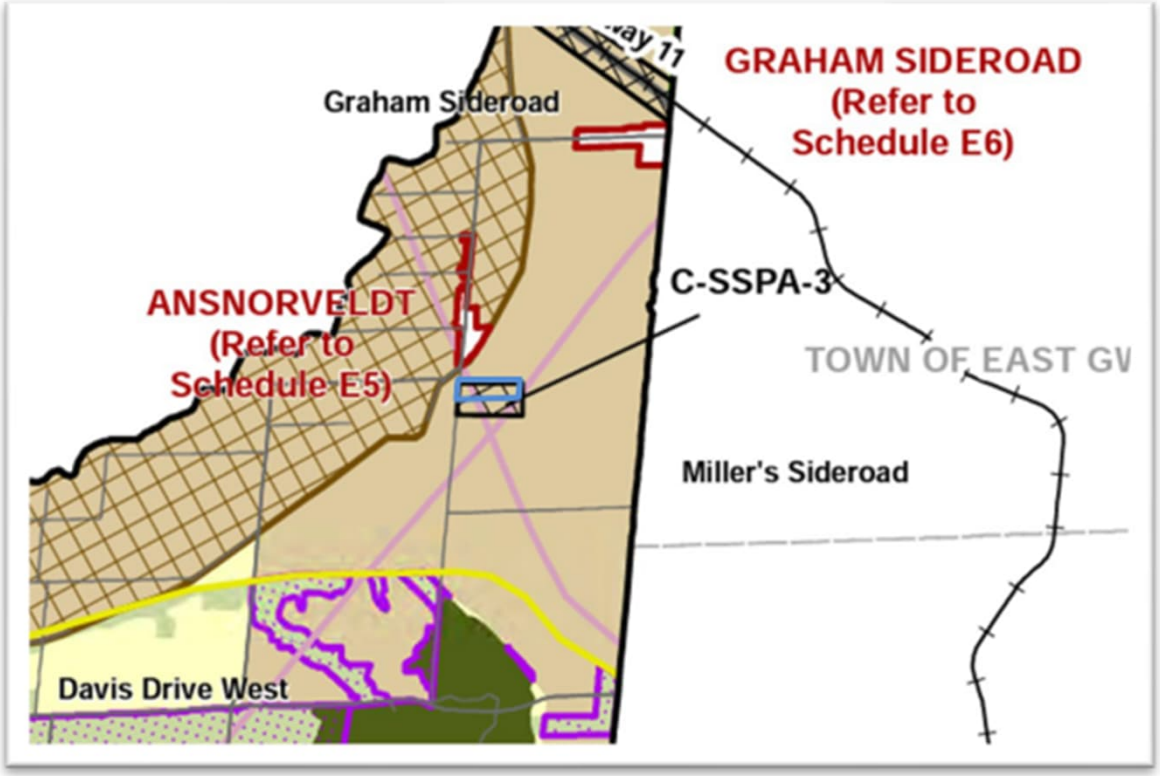
Noise Assessment

York Energy Centre Upgrades Project

Capital Power Corporation

SLR Project No.: 241.030524.00026

July 2024



TOWNSHIP OF KING OFFICIAL PLAN

- Township of King Boundary
- Village Boundary
- Nobleton Urban Area
- Hamlet Boundary (refer to Schedules E1 – E7 for land use designations)
- Greenbelt Plan Area Boundary
- Oak Ridges Moraine Conservation Plan Area Boundary
- Area Subject to the Lake Simcoe Protection Plan
- GO Rail Line
- Hydro Corridor
- TransCanada Pipeline

- Site Specific Policy Area (SSPA)
- Subject to Deferral
- Holland Marsh Specialty Crop Area
- Prime Agricultural Area in the ORM Natural Core Areas and Natural Linkage Areas
- Nobleton Water Resource Recovery Facility

Land Use Designations

- Agricultural Area
- Rural Area
- Oak Ridges Moraine Natural Core Area
- Oak Ridges Moraine Natural Linkage Area

Source: Township of King Official Plan Schedule E

True North

CAPITAL POWER CORPORATION

YORK ENERGY CENTRE UPGRADES PROJECT

TOWNSHIP OF KING OFFICIAL PLAN SCHEDULE E

Scale:	NTS		METRES
Date:	July 2024	Rev 0.0	Figure No. **A.1**
Project No.241.V30524.00026			

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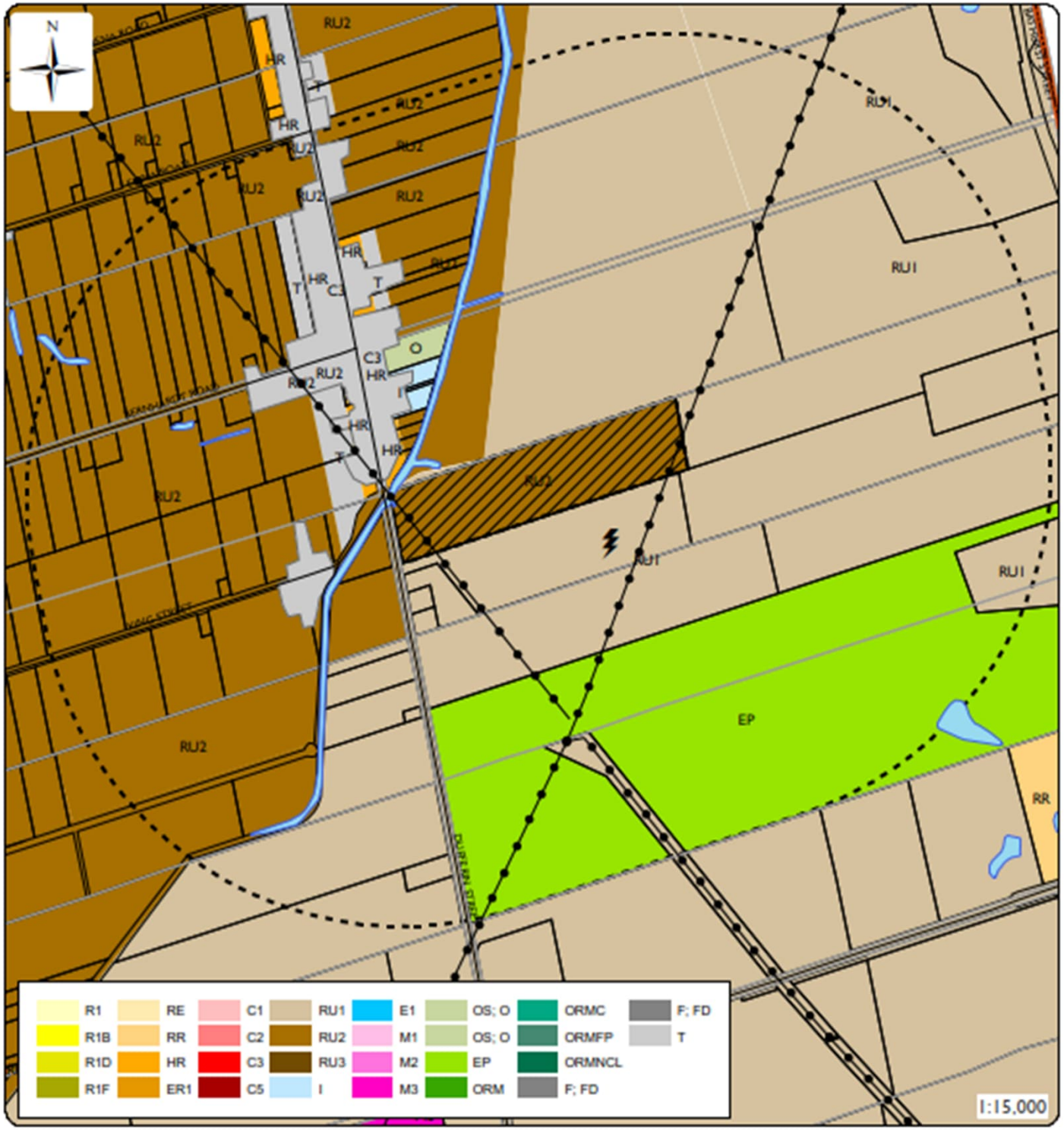


Zone	Zone Symbol
Rural Residential	RR
Rural Estate Residential	RE
Rural Commercial	RC
Rural Employment	RM
Rural Employment Greenbelt	RMG
Rural Mineral Aggregate	RX
Agricultural	A
Agricultural Specialty Crop	AS
Agricultural Related	AR

True North

CAPITAL POWER CORPORATION

YORK ENERGY CENTRE
UPGRADES PROJECT

TOWNSHIP OF KING ZONING MAP

Scale:	1:15,000		METRES
Date:	July 2024	Rev 0.0	Figure No. **A.2**
Project No.241.V30524.00026			

SLR

Appendix B Source and Emission Summary Information:

Acoustic Assessment Report, Table 3.2 and Figure 3.1
(Dillon Consulting Ltd. 2011)

Noise Assessment

York Energy Centre Upgrades Project

Capital Power Corporation

SLR Project No.: 241.030524.00026

July 2024

TABLE 3.2 – SOUND POWER LEVEL SPECTRUM FOR DOMINANT ON-SITE NOISE SOURCES

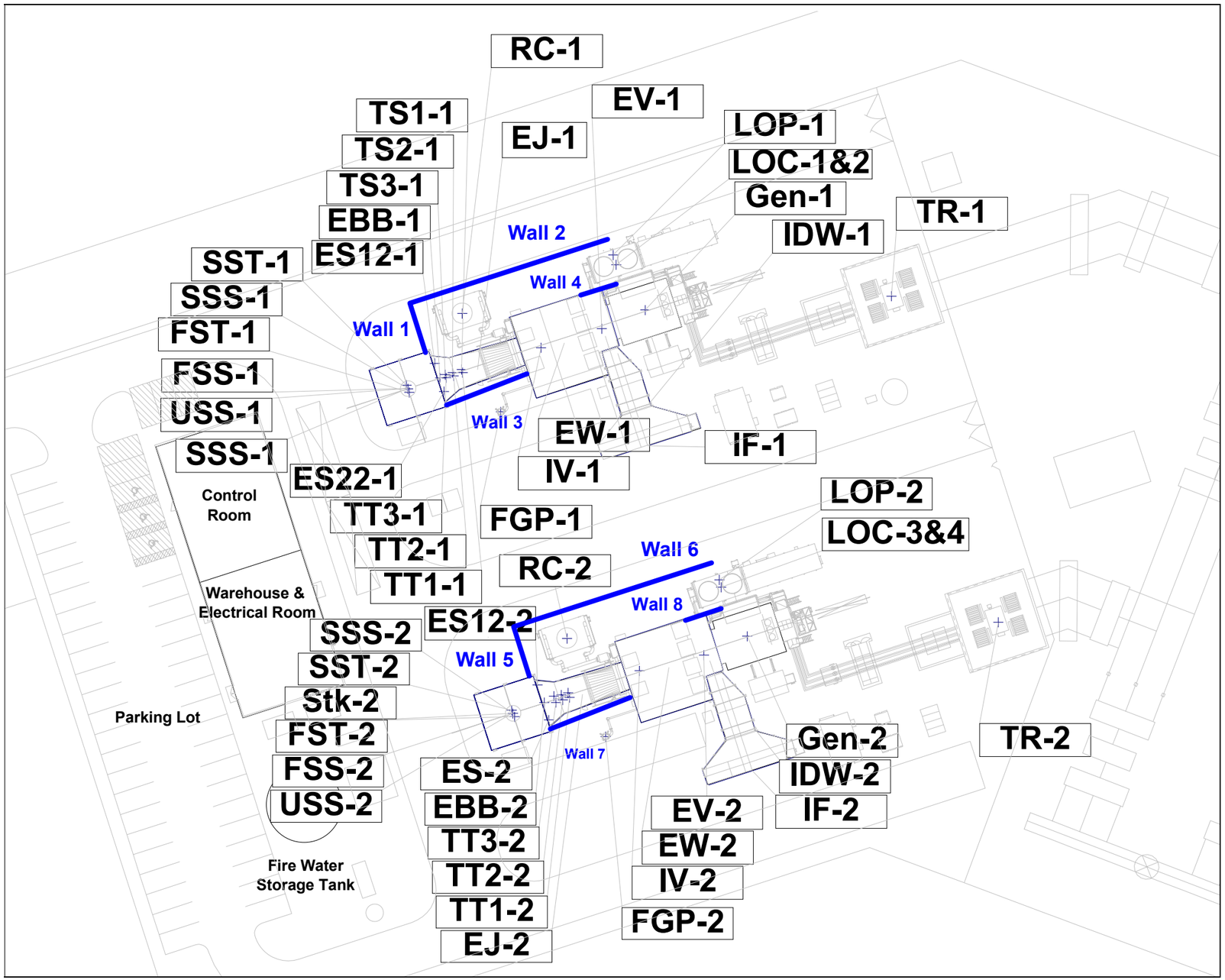
Facility	Source		Corresponding Source IDs in Figure 3.2 and Table 3.4		Weight	Spectrum (dB)									Overall		Source
	Name	ID	ID	Description		31.5	63	125	250	500	1000	2000	4000	8000	A (dBA)	lin (dB)	
York Energy Centre	Fin Fan Lube Oil Cooler	LOC	LOC-1&2	Twin Fin Fans for Lube Oil Cooler #1 (North)	Linear	113	107	104	101	100	96	104	91	83	106.6	115.2	Siemens Specification Appendix B - Page 1
			LOC-3&4	Twin Fin Fans for Lube Oil Cooler #2 (South)													
	Fin Fan Rotor Air Cooler	RC	RC-1	Fin Fan Rotor Air Cooler #1 (North)	Linear	107	111	102	96	94	89	85	83	79	96	113	Siemens Specification Appendix B - Page 1
			RC-2	Fin Fan Rotor Air Cooler #2 (South)													
	Fuel Gas Piping	FGP	FGP-1	Fuel Gas Piping #1 (North)	Linear	104	100	89	81	80	86	88	91	89	95.5	105.9	Siemens Specification Appendix B - Page 1
			FGP-2	Fuel Gas Piping #2 (South)													
	Generator - OAC	Gen	Gen-1	Generator #1 (North)	Linear	109	117	107	96	89	87	88	85	76	97.1	118	Siemens Specification Appendix B - Page 1
			Gen-2	Generator #2 (South)													
	GT Enclosure Inlet Vent	IV	IV-1	GT Enclosure Air Inlet Vent #1 (North)	Linear	89	95	84	80	73	71	76	77	83	85.1	96.7	Siemens Specification Appendix B - Page 1
			IV-2	GT Enclosure Air Inlet Vent #2 (South)													
	GT Enclosure Air Discharge Vent	EV	EV-1	GT Enclosure Air Discharge Vent #1 (North)	Linear	91	96	88	84	75	74	74	73	78	83.2	98	Siemens Specification Appendix B - Page 1
			EV-2	GT Enclosure Air Discharge Vent #2 (South)													
	GT Enclosure Wall	EW	EW-1	GT Enclosure Wall #1 (North)	Linear	93	94	86	77	70	74	75	67	57	80.1	97	Siemens Specification Appendix B - Page 1
			EW-2	GT Enclosure Wall #2 (South)													
	GT Exhaust Diffuser and Expansion Joint	EJ	EJ-1	GT Exhaust Diffuser and Expansion Joint #1 (North)	Linear	120	115	108	108	105	101	97	97	79	107.1	121.8	Siemens Specification Appendix B - Page 1
			EJ-2	GT Exhaust Diffuser and Expansion Joint #2 (South)													
	GT Inlet Duct Wall	IDW	IDW-1	GT Inlet Duct Wall #1 (North)	Linear	104	102	103	92	82	90	79	82	86	93.9	108.1	Siemens Specification Appendix B - Page 1
			IDW-2	GT Inlet Duct Wall #2 (South)													
	GT Stack Noise Data (Raw)	Stk	Stk-1	GT Stack Top #1 (North)	Linear	145	144	146	145	146	145	142	144	129	150.4	153.8	Siemens Specification Appendix B - Page 1
			Stk-2	GT Stack Top #2 (South)													

Facility	Source		Corresponding Source IDs in Figure 3.2 and Table 3.4		Weight	Spectrum (dB)									Overall		Source
	Name	ID	ID	Description		31.5	63	125	250	500	1000	2000	4000	8000	A (dBA)	lin (dB)	
	Inlet Filter with Siemens Base Design Silencer	IF	IF-1	Inlet Filter with Siemens Base Design Silencer #1 (North)	Linear	120	118	111	99	83	89	83	90	100	102	122.5	Siemens Specification Appendix B - Page 1
			IF-2	Inlet Filter with Siemens Base Design Silencer #2 (South)													
	Lube Oil Package II with Siemens Silencer	LOP	LOP-1	Lube Oil Package #1 (North)	Linear	94	94	112	95	97	92	89	85	80	99.9	112.4	Siemens Specification Appendix B - Page 1
			LOP-2	Lube Oil Package #2 (South)													
	Transition Piece 1 - sides	TS1	TS1-1	Transition piece 1 sides - #1 (North)	Linear	108	97	85	75	64	56	46	45	17	75.2	108.4	IST Inc. Specifications Appendix B - Page 2
			TS1-2	Transition piece 1 sides - #2 (South)													
	Transition Piece 2 - sides	TS2	TS2-1	Transition piece 2 sides - #1 (North)	Linear	104	93	81	71	60	52	42	41	13	71.2	104.4	IST Inc. Specifications Appendix B - Page 2
			TS2-2	Transition piece 2 sides - #2 (South)													
	Transition Piece 3 - Sides	TS3	TS3-1	Transition piece 3 sides - #1 (North)	Linear	85	71	48	8	0	0	0	3	28	48.4	85.2	IST Inc. Specifications Appendix B - Page 2
			TS3-2	Transition piece 3 sides - #2 (South)													
	Transition Piece 1 - Top	TT1	TT1-1	Transition piece 1 top - #1 (North)	Linear	108	97	85	75	64	56	46	45	17	75.2	108.4	IST Inc. Specifications Appendix B - Page 2
			TT1-2	Transition piece 1 top - #2 (South)													
	Transition Piece 2 - Top	TT2	TT2-1	Transition piece 2 top - #1 (North)	Linear	107	96	84	74	63	55	45	44	16	74.2	107.4	IST Inc. Specifications Appendix B - Page 2
			TT2-2	Transition piece 2 top - #2 (South)													
	Transition Piece 3 - Top	TT3	TT3-1	Transition piece 3 top - #1 (North)	Linear	84	70	47	7	0	0	0	2	27	47.4	84.2	IST Inc. Specifications Appendix B - Page 2
			TT3-2	Transition piece 3 top - #2 (South)													
	Elbow sides 1/2	ES12	ES12-1	Elbow sides 1 of 2 - #1 (North)	Linear	106	102	100	95	90	89	86	85	61	94.7	108.5	IST Inc. Specifications Appendix B - Page 2
			ES12-2	Elbow sides 1 of 2 - #2 (South)													
	Elbow sides 2/2	ES22	ES22-1	Elbow sides 2 of 2 - #1 (North)	Linear	106	102	100	95	90	89	86	85	61	94.7	108.5	IST Inc. Specifications Appendix B - Page 2
			ES22-2	Elbow sides 2 of 2 - #2 (South)													
	Elbow back and bottom	EBB	EBB-1	Elbow back and bottom #1 (North)	Linear	108	104	102	97	92	91	88	87	63	96.7	110.5	IST Inc. Specifications Appendix B - Page 2
			EBB-2	Elbow back and bottom #2 (South)													

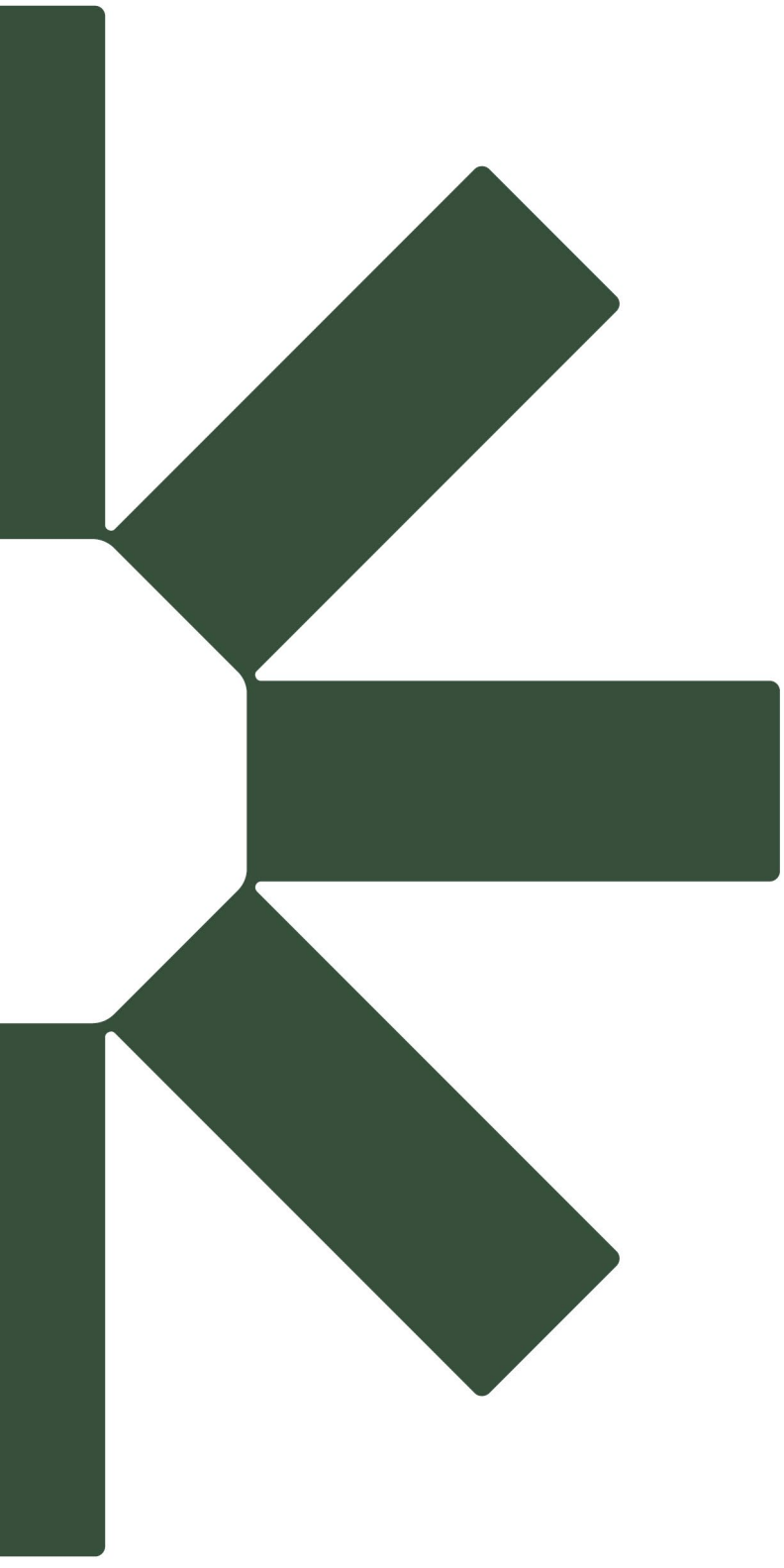
Facility	Source		Corresponding Source IDs in Figure 3.2 and Table 3.4		Weight	Spectrum (dB)									Overall		Source
	Name	ID	ID	Description		31.5	63	125	250	500	1000	2000	4000	8000	A (dBA)	lin (dB)	
	Silencer first stage sides	SSS	SSS-1	Silencer first stage sides #1 (North)	Linear	106	102	100	95	90	89	86	85	61	94.7	108.5	IST Inc. Specifications Appendix B - Page 2
			SSS-2	Silencer first stage sides #2 (South)													
	Silencer first stage top	FST	FST-1	Silencer first stage top #1 (North)	Linear	105	101	99	94	89	88	85	84	60	93.7	107.5	IST Inc. Specifications Appendix B - Page 2
			FST-2	Silencer first stage top #2 (South)													
	Silencer second stage sides	SSS	SSS-1	Silencer second stage sides #1 (North)	Linear	80	67	42	1	0	0	0	0	26	43.8	80.2	IST Inc. Specifications Appendix B - Page 2
			SSS-2	Silencer second stage sides #2 (South)													
	Silencer second stage top	SST	SST-1	Silencer second stage top #1 (North)	Linear	78	64	32	0	0	0	0	0	29	41.4	78.2	IST Inc. Specifications Appendix B - Page 2
			SST-2	Silencer second stage top #2 (South)													
	Upper SQ Stack	USS	USS-1	Upper SQ stack #1 (North)	Linear	74	60	22	0	0	0	0	0	28	37.6	74.2	IST Inc. Specifications Appendix B - Page 2
			USS-2	Upper SQ stack #2 (South)													
	Step-up Transformer	TR	TR-1	Step-up Transformer #1 (North)	Linear	90	96	98	93	93	87	82	77	70	93.4	102	Dillon in-house database
			TR-2	Sep-up Transformer #2 (South)													

Note:
The 1/1 Octave band spectra are Sound Power Levels (PWLs).
Overall Sound Power Level is presented in A-weighted (A) and Linear (Lin)
Sound Power Level 1/1 Octave bands presented correspond to operation under maximum load (i.e. noise level maxima).

FIGURE 3.1 – NOISE SOURCE LOCATIONS



Note: The acoustic barrier walls are depicted with blue lines (—).



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