NOISE & ODOUR IMPACT STUDY

"TOWNHOUSE DEVELOPMENT"
7525 GARNER ROAD
NIAGARA FALLS, ON
REGION OF NIAGARA

Prepared for:

Madan Arianna Developments Inc.
145 Traders Boulevard, Unit 20
Mississauga, ON
L4Z 3L3

Prepared By:

Nicole Cleaver
Noise Consultant

Reviewed By:

Frank Westaway
Qualified Acoustical Consultant

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Our File No: 24-2017

dBA Acoustical Consultants Inc.
P.O Box 99046
Stoney Creek, ON
RPO Heritage Green
L8J 2P7

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1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has been retained by Madan Arianna Developments Inc., to provide a noise and odour impact study for the proposed 7525 Garner Road Townhouse Development located in Niagara Falls, ON, Region of Niagara.

The purpose of the study will determine the noise impact from Garner Road and McLeod Road vehicular traffic that may impact the proposed townhouse development, as required for application approval for the City of Niagara Falls, Region of Niagara.

This study will detail noise and odour impact relative to the site plan and recommend noise control measures necessary (if applicable) to meet Ministry of Environment Conservation and Parks (MECP) Publication NPC-300 entitled "Stationary & Transportation Sources-Approval & Planning guidelines while satisfying the planning requirements of the City of Niagara Falls, Region of Niagara.

Vibration is not considered as there are no heavy industrial operations in the proposed development site area. Aircraft is not a concern as the development is located outside the NEF 25 contour of the area. Approximately 2 km southwest is Solvay/Cytec Canada (9061 Garner Road). The noise and odour from this operation will be discussed later in this report. See attached Figure 6 Area Overview Map.

2.0 SITE DESCRIPTION

Proposed are three blocks of stacked 3-storey townhouses with 18 units each for Blocks A & B, and 15 units for Block C for a total of 51 units. To the immediate north is a 1-storey single family home and further north are a mix of 1 and 2 storey single family homes and townhouses. To the east and south are 2-storey single family homes. To the west is densely treed lands.

The proposed townhouse development is located approximately 20m west of Garner Road, which is a two-lane roadway running north and south with a posted speed limit of 60km/hr. McLeod Road is approximately 435m north and is a two-lane roadway running east and west, with a posted speed limit of 60 km/hr. Other area local streets do not have an acoustical impact on the townhouse development due to low traffic volumes, distance and speed limits. There are no stationary noise sources in the immediate area that would have an acoustical effect on the proposed development. See attached Figure 2 Site Plan.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The MECP specifies limits for road noise relative to new residential developments. The MECP Publication NPC-300 entitled "Stationary & Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

TABLE 1 - Road Traffic Sound Levels Limits	
Time Period	Leq (dBA)
07:00 – 23:00 (16 hr.)	55 Outdoor Living area
07:00 – 23:00 (16 hr.)	55 Plane of Window
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom window

The OLA refers to an outdoor patio, a backyard, a terrace or other area where outdoor passive recreation is expected. Noise levels are calculated at the upper storey bedroom window to represent nighttime (23:00-0700) periods.

TABLE 2 – Noise Control Requirements		
Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	55 to 60	Warning Clause Type "A"
	> 60	Barrier & Warning Clause Type "B"
07:00 – 23:00 Daytime (POW)	> 55	Provision for A/C, Warning Clause "C"
	> 65	Central A/C, Warning Clause "D"
	> 65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50	Provision for A/C and Warning Clause Type "C"
	> 60	Building Component Specification
	> 60	Central Air and Warning Clause Type "D"

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet Table 3 indoor sound level limits.

TABLE 3 - Indoor Road Sound Levels Limits		
Indoor Location	Leq (dBA)	
	Road	Rail
Living/Dining 7:00 – 23:00	45	NA
Bedroom 23:00 - 07:00	40	NA

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for Garner Road and McLeod Road which are considered the major road noise sources in the proposed townhouse development area. The current road traffic volumes for Garner Road are from 2022 AADT (Annual Average Daily Traffic) and McLeod Road are from 2025, and both were provided via email from John Grubich, C.E.T. Traffic Planning Supervisor, Municipal Works – Transportation Services for the City of Niagara Fall. See Appendix "A".

The MECP computer program STAMSON version 5.04 was used to carry out prediction calculations and the traffic data is summarized in Table 5. The daytime/nighttime volume ratios relative to both roadways are calculated using a 90/10 split. (See Appendix "A")

The percentage of annual growth for Garner Road was figured at 2% over 13 years and McLeod Road was figured at 2% over 10 years and are considered as the worst-case scenario. Garner Road and McLeod Road truck volumes were factored at 2% medium and 2% heavy of the total vehicle volumes.

TABLE 4 – Future Road Traffic Volumes (2035)			
Garner Road (2022)	AADT 3830 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	3309	69	69
Night	368	8	8
McLeod Road (2025)	AADT 12908 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	11152	232	232
Night	1239	26	26

The following Table 5A summarizes the Garner Road "free field" traffic noise prediction results, modeled at 4 receptor locations. (See Figure 3 Receptor Locations).

TABLE 5A – Predicted Garner Road Future Traffic Noise (dBA)		
Montrose Road	07:00 – 23:00	23:00 – 07:00
R1 – Block A – Unit 18 Ground East Façade 1st Floor (1.5m)	58 dBA	51 dBA
R2 – Block A – Unit 17 Upper East Façade 3rd Floor (7.5m)	53 dBA	47 dBA
R3 – Block A – Unit 18 Ground North Façade 1st Floor (1.5m)	51 dBA	45 dBA
R4 – Block A – Unit 17 Upper North Façade 3rd Floor (7.5m)	52 dBA	45 dBA

The following Table 5B summarizes the McLeod Road "free field" traffic noise prediction results, modeled at 4 receptor locations. (See Figure 3 Receptor Locations).

TABLE 5B – Predicted McLeod Road Future Traffic Noise (dBA)		
Montrose Road	07:00 – 23:00	23:00 – 07:00
R1 – Block A – Unit 18 Ground East Façade 1st Floor (1.5m)	25 dBA	18 dBA
R2 – Block A – Unit 17 Upper East Façade 3rd Floor (7.5m)	30 dBA	24 dBA
R3 – Block A – Unit 18 Ground North Façade 1st Floor (1.5m)	28 dBA	21 dBA
R4 – Block A – Unit 17 Upper North Façade 3rd Floor (7.5m)	30 dBA	24 dBA

The following Table 5C summarizes the COMBINED "free field" traffic noise prediction results for both roadways, modeled at 4 receptor locations. (See Figure 3 Receptor Locations).

TABLE 5C – COMBINED Future Traffic Noise (dBA)		
Montrose Road	07:00 – 23:00	23:00 – 07:00
R1 – Block A – Unit 18 Ground East Façade 1st Floor (1.5m)	58 dBA	51 dBA
R2 – Block A – Unit 17 Upper East Façade 3rd Floor (7.5m)	53 dBA	47 dBA
R3 – Block A – Unit 18 Ground North Façade 1st Floor (1.5m)	51 dBA	45 dBA
R4 – Block A – Unit 17 Upper North Façade 3rd Floor (7.5m)	52 dBA	45 dBA

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR NOISE LEVELS

Calculated daytime road noise levels at the Plane of Window (POW) exceed the 55 dBA criteria for R1 as outlined in Table 2. In lieu of a noise barrier a Warning Clause "A" can be inserted into all Offers and Agreements of Purchase and Sale or Lease.

These stacked townhouses do not include any rear yard Outdoor Living Areas (OLA's), and the proposed balconies are less than 4m in depth and not considered as OLA by the MECP NPC-300, therefore mitigation measures are not required for these areas.

4.2 INDOOR NOISE LEVELS

Calculated nighttime road noise levels at the Plane of Window (POW) exceed the 50 dBA for R1 as outlined in Table 2 for indoor spaces. Ontario Building Code (OBC) will suffice for the proposed townhouse development. It is recommended that STC-28 non-acoustically tested windows be installed as they will achieve MECP NPC-300 Transportation and Stationary Sources Noise guidelines.

TABLE 6 – Recommended Door, Wall, and Window Construction

LOCATION	Window STC To Be Used	Exterior Wall STC	Patio Door Construction STC
Block A, B & C	Example	Example	Example
Bedroom	OBC	OBC	OBC
Living room	OBC	OBC	OBC

5.0 VENTILATION / WARNING CLAUSES

Ventilation and Warning Clause requirements are required for this project as noted in Table 7 following. It is recommended that the appropriate Warning Clauses be inserted into all Offers and Agreements of Purchase and Sale or Lease.

TABLE 7 - Ventilation and Warning Clause Requirements

LOCATION	VENTILATION	WARNING CLAUSE
Blocks A, B & C	Provisions for Air Conditioning	Type "C"

TYPE C: (Blocks 1, 2 & 3)
"This dwelling unit had been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the MECP's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MECP Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)"

6.0 NOISE CONTROL REQUIREMENTS CONFIRMATION

The following Table 8 summarizes the highest roadway noise levels (Table 5) for the daytime/nighttime hours at the south façade. Table 8 below recommends provisions for air conditioning, warning clause and indoor noise level limits criteria. Table 8 show that with the Warning Clause and STC requirements listed below the redevelopment will meet the MECP minimum required indoor noise level limits.

TABLE 8 - Noise Control Requirements Confirmation

Time Period	Predicted Impact, Leq (dBA)	A/C Req.	Warning Clause	Indoor Limits, Leq (dBA)		Window / Floor Area Ratio (%)	Wall / Floor Area Ratio (%)	STC Requirements			
				Living, Dining, and Den Areas	Sleeping Quarters			Living, Dining, and Den Areas		Sleeping Quarters	
	Road			Road	Road			Window	Wall	Window	Wall
Day	58	P	C	45	45	80%	100%	24	26	24	26
Night	51	P	C	45	40	80%	100%	16	18	22	24

7.0 STATIONARY NOISE & ODOUR SOURCES

7.1 Solvay/Cytec Canada (9061 Garner Road)

Solvay/Cytec Canada is a chemical and material company located approximately 2km from the proposed development. As the result of a previous noise and odour complaint violation, the company was required to submit an Environmental Compliance Approval (ECA), dated February 2022. The ECA, approved by the MECP, requires that the company maintain and control noise and odour emissions within their property lines. As a result of the ECA, the noise and odour will not have an impact on the proposed development. See attached ECA in Appendix “B”.

8.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures are required for this development:

- Provisions for Central Air Conditioning as recommended for all Blocks (Table 7).
- OBC for Window, Door, and Wall construction as recommended in Table 6.
- Registered Warning Clause Type “C” for all Blocks (Table 8).
- It is recommended that a qualified acoustical consultant certify that the required noise control measures have been incorporated into the builder’s plans prior to issuance of a building permit.
- It is recommended that a qualified acoustical consultant certify that the required control measures have been properly installed prior to an occupancy permit.

9.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has been retained by Madan Arianna Developments Inc. to provide a noise and odour impact study for the proposed 7525 Garner Road Townhouse Development located in Niagara Falls, ON, Region of Niagara.

The study determined the noise impact from Garner Road and McLeod Road vehicular traffic that impacted the proposed townhouse development, as required for application approval for the City of Niagara Falls, Region of Niagara.

This study detailed noise and odour impact relative to the site plan and recommended noise control measures necessary to meet Ministry of Environment Conservation and Parks (MECP) Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning guidelines while satisfying the planning requirements of the City of Niagara Falls, Region of Niagara.

FIGURE 1
KEY PLAN

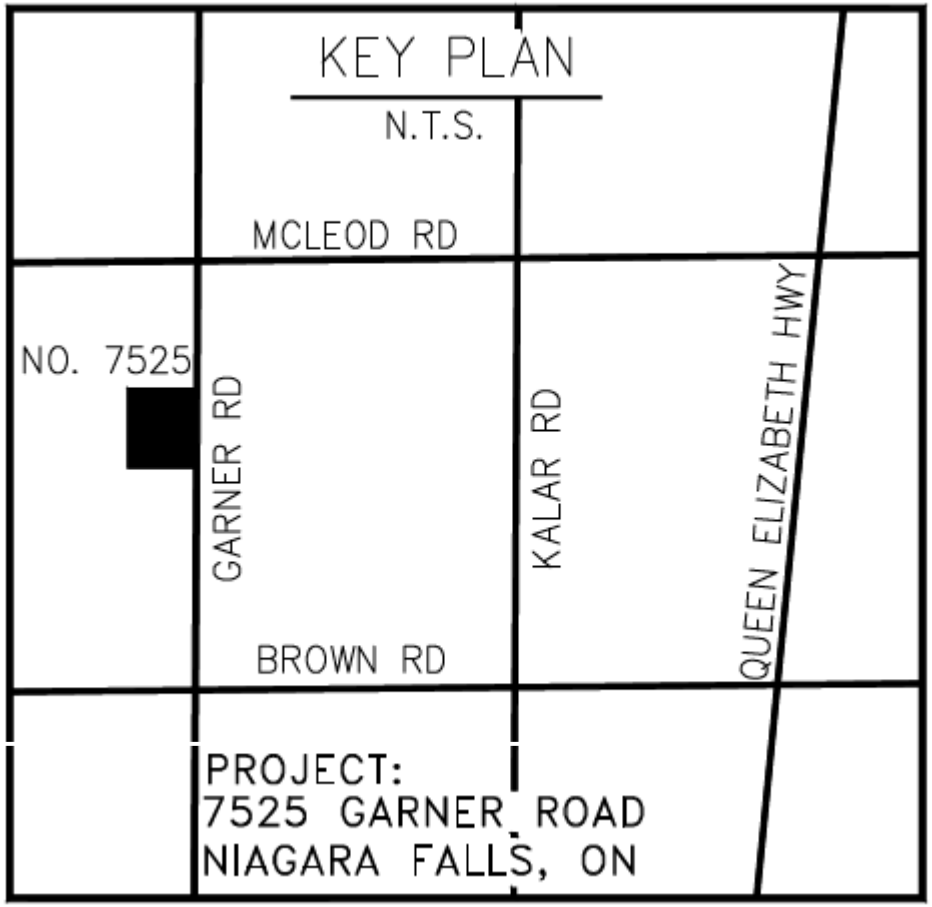
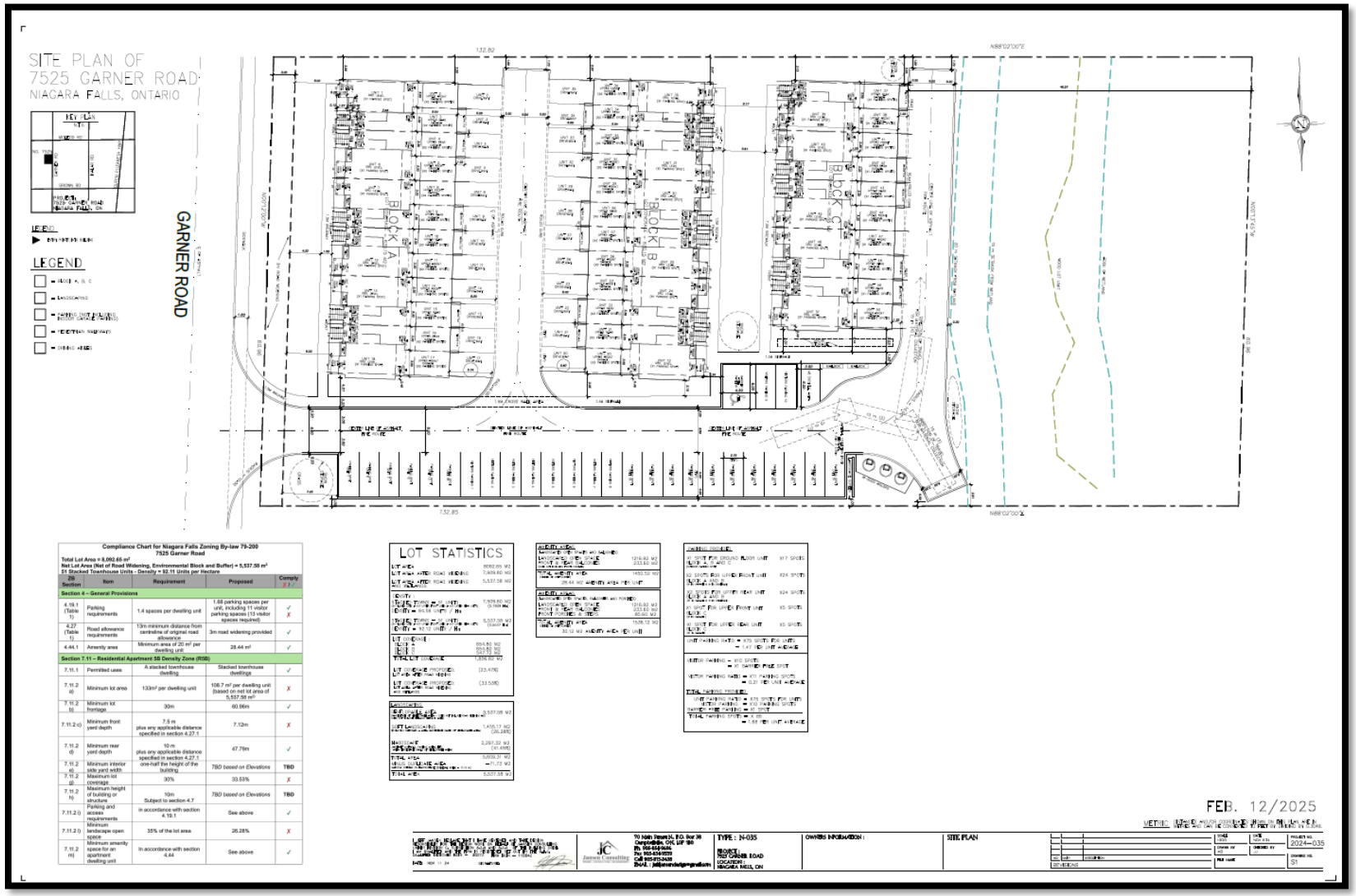


FIGURE 2
SITE PLAN



Compliance Chart for Niagara Falls Zoning By-law 79-200
7525 Garner Road

Total Lot Area = 9,092.65 m²
Net Lot Area (Net of Road Widening, Environmental Block and Buffer) = 5,537.58 m²
51 Stacked Townhouse Units - Density = 92.11 Units per Hectare

By-law Section	Item	Requirement	Proposed	Comply ✓ / ✗
Section 4 – General Provisions				
4.19.1 (Table 1)	Parking requirements	1.4 spaces per dwelling unit	1.68 parking spaces per unit, including 11 visitor parking spaces (10 visitor spaces required)	✓ ✗
4.27 (Table 1)	Road allowance requirements	13m minimum distance from centreline of original road allowance	3m road widening provided	✓
4.44.1	Amenity area	Minimum area of 20 m² per dwelling unit	28.44 m²	✓
Section 7.11 – Residential Apartment 5B Density Zone (R5B)				
7.11.1	Permitted uses	A stacked townhouse dwelling	Stacked townhouse dwellings	✓
7.11.2 a)	Minimum lot area	133m² per dwelling unit	108.7 m² per dwelling unit (based on net lot area of 5,537.58 m²)	✗
7.11.2 b)	Minimum lot frontage	30m	60.96m	✓
7.11.2 c)	Minimum front yard depth	7.5 m plus any applicable distance specified in section 4.27.1	7.12m	✗
7.11.2 d)	Minimum rear yard depth	10 m plus any applicable distance specified in section 4.27.1	47.79m	✓
7.11.2 e)	Minimum interior side yard width	one-half the height of the building	TBD based on Elevations	TBD
7.11.2 g)	Maximum lot coverage	30%	33.53%	✗
7.11.2 h)	Maximum height of building or structure	10m Subject to section 4.7	TBD based on Elevations	TBD
7.11.2 i)	Parking and access requirements	in accordance with section 4.19.1	See above	✓
7.11.2 l)	Minimum landscape open space	35% of the lot area	26.28%	✗
7.11.2 m)	Minimum amenity space for an apartment dwelling unit	in accordance with section 4.44	See above	✓

FIGURE 3
RECEPTOR LOCATIONS

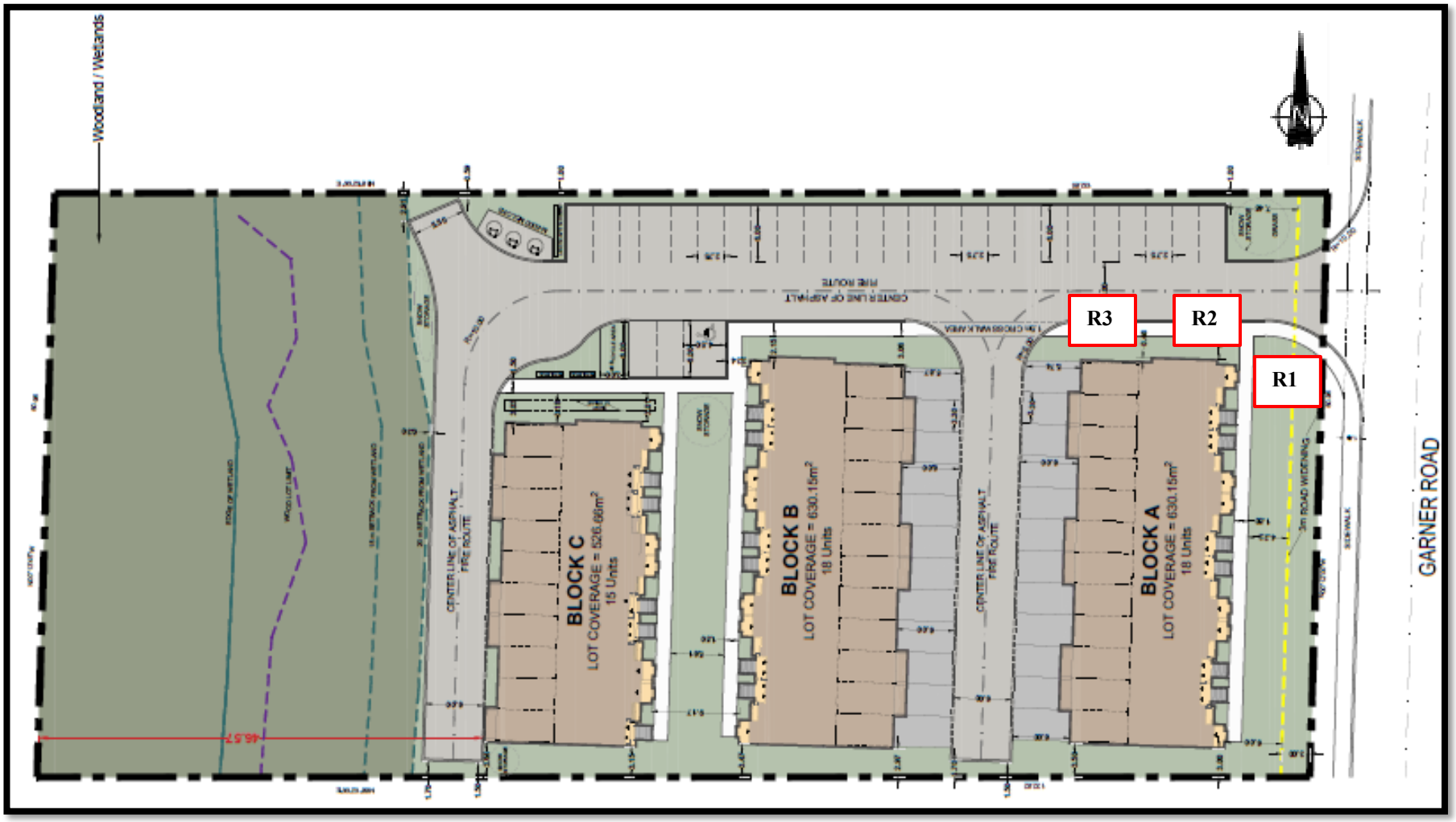


FIGURE 4
OVERLAY LOCATION MAP

FIGURE 5
AREA OVERVIEW MAP

APPENDIX “A”

2022 NIAGARA FALLS AADT
GARNER ROAD – NORTHBOUND

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Falls
Street: 7365 Garner Rd - NB
Location: 6

A study of vehicle traffic was conducted with the device having serial number 405079. The study was done in the NB lane at 7365 Garner Rd - NB in Niagara Falls, ON in btwn McLeod Rd & Warren Woods county. The study began on 2022-08-04 at 12:00 AM and concluded on 2022-08-08 at 12:00 AM, lasting a total of 96.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 5,885 vehicles passed through the location with a peak volume of 42 on 2022-08-05 at [03:00 PM-03:15 PM] and a minimum volume of 0 on 2022-08-04 at [01:00 AM-01:15 AM]. The AADT count for this study was 1,471.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 60 - 65 KM/H range or lower. The average speed for all classifed vehicles was 62 KM/H with 63.03% vehicles exceeding the posted speed of 60 KM/H. 4.23% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 60KM/H and the 85th percentile was 75.08 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 104	105 to >
408	185	184	563	827	1052	979	778	392	246	133	41	35	12	27

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 5653 which represents 96 percent of the total classified vehicles. The number of Small Trucks in the study was 41 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 93 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 75 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 21.9	22.0 to >							
2458	3195	41	93	52	4	16	3							

CHART 2

HEADWAY

During the peak traffic period, on 2022-08-05 at [03:00 PM-03:15 PM] the average headway between vehicles was 20.93 seconds. During the slowest traffic period, on 2022-08-04 at [01:00 AM-01:15 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 25.00 and 50.00 degrees C.

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2022 NIAGARA FALLS AADT
GARNER ROAD – SOUTHBOUND

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Falls
Street: 7365 Garner Rd - SB
Location: 6

A study of vehicle traffic was conducted with the device having serial number 406306. The study was done in the SB lane at 7365 Garner Rd - SB in Niagara Falls, ON in btwn McLeod Rd & Warren Woods county. The study began on 2022-08-04 at 12:00 AM and concluded on 2022-08-08 at 12:00 AM, lasting a total of 96.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 5,958 vehicles passed through the location with a peak volume of 44 on 2022-08-04 at [04:15 PM-04:30 PM] and a minimum volume of 0 on 2022-08-04 at [01:15 AM-01:30 AM]. The AADT count for this study was 1,490.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 60 - 65 KM/H range or lower. The average speed for all classifed vehicles was 59 KM/H with 50.91% vehicles exceeding the posted speed of 60 KM/H. 1.98% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 60KM/H and the 85th percentile was 70.90 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 104	105 to >
427	175	304	857	1141	1201	824	549	223	98	55	19	23	5	15

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 5689 which represents 96 percent of the total classified vehicles. The number of Small Trucks in the study was 46 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 100 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 81 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 21.9	22.0 to >							
2782	2907	46	100	51	9	17	4							

CHART 2

HEADWAY

During the peak traffic period, on 2022-08-04 at [04:15 PM-04:30 PM] the average headway between vehicles was 20 seconds. During the slowest traffic period, on 2022-08-04 at [01:15 AM-01:30 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 24.00 and 47.00 degrees C.

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2025 NIAGARA FALLS AADT
MCLEOD ROAD – WESTBOUND

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Falls
Street: McLeod Rd - WB
Location: 26

A study of vehicle traffic was conducted with the device having serial number 405284. The study was done in the WB lane at McLeod Rd - WB in Niagara Falls, ON in btwn St Michael Ave & Garner Rd county. The study began on 2025-06-05 at 12:00 AM and concluded on 2025-06-09 at 12:00 AM, lasting a total of 96.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 21,651 vehicles passed through the location with a peak volume of 151 on 2025-06-06 at [04:30 PM-04:45 PM] and a minimum volume of 0 on 2025-06-05 at [03:30 AM-03:45 AM]. The AADT count for this study was 5,413.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 50 - 55 KM/H range or lower. The average speed for all classifed vehicles was 51 KM/H with 58.34% vehicles exceeding the posted speed of 50 KM/H. 0.29% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 50KM/H and the 85th percentile was 60.68 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 104	105 to >
1959	1858	5177	5190	3892	2026	897	365	121	43	24	12	6	3	18

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 21056 which represents 98 percent of the total classified vehicles. The number of Small Trucks in the study was 115 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 252 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 168 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 21.9	22.0 to >							
8760	12296	115	252	115	17	20	16							

CHART 2

HEADWAY

During the peak traffic period, on 2025-06-06 at [04:30 PM-04:45 PM] the average headway between vehicles was 5.921 seconds. During the slowest traffic period, on 2025-06-05 at [03:30 AM-03:45 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 20.00 and 46.00 degrees C.

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2025 NIAGARA FALLS AADT
MCLEOD ROAD – EASTBOUND

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Falls
Street: McLeod Rd - EB
Location: 26

A study of vehicle traffic was conducted with the device having serial number 408176. The study was done in the EB lane at McLeod Rd - EB in Niagara Falls, ON in btwn St Michael Ave & Garner Rd county. The study began on 2025-06-05 at 12:00 AM and concluded on 2025-06-09 at 12:00 AM, lasting a total of 96.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 20,705 vehicles passed through the location with a peak volume of 146 on 2025-06-08 at [12:30 PM-12:45 PM] and a minimum volume of 0 on 2025-06-08 at [03:15 AM-03:30 AM]. The AADT count for this study was 5,176.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 55 - 60 KM/H range or lower. The average speed for all classifed vehicles was 58 KM/H with 84.45% vehicles exceeding the posted speed of 50 KM/H. 0.52% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 55KM/H and the 85th percentile was 67.09 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 104	105 to >
536	517	2161	3987	4897	4505	2306	1137	343	170	47	23	18	4	15

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 20188 which represents 98 percent of the total classified vehicles. The number of Small Trucks in the study was 121 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 190 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 167 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 21.9	22.0 to >							
6743	13445	121	190	123	20	14	10							

CHART 2

HEADWAY

During the peak traffic period, on 2025-06-08 at [12:30 PM-12:45 PM] the average headway between vehicles was 6.122 seconds. During the slowest traffic period, on 2025-06-08 at [03:15 AM-03:30 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 19.00 and 47.00 degrees C.

2025-06-11 06:53 PM Page: 1

STAMSON CALCULATIONS

```
STAMSON 5.04        SUMMARY REPORT        Date: 09-07-2025 15:04:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1garner.te          Time Period: Day/Night 16/8 hours
Description: R1 Block A Unit 18 Ground East Facade 1st Floor
                  TOTAL Leq FROM ALL SOURCES              (DAY): 57.58
                                                         (NIGHT): 51.15

Road data, segment # 1: Garner Rd (day/night)
----------------------------------------------
Car traffic volume  :  3309/368   veh/TimePeriod  *
Medium truck volume :    69/8     veh/TimePeriod  *
Heavy truck volume  :    69/8     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   2961
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Garner Rd (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)

Road data, segment # 2: McLeod Rd (day/night)
---------------------------------------------
Car traffic volume  : 11152/1239  veh/TimePeriod  *
Medium truck volume :   232/26    veh/TimePeriod  *
Heavy truck volume  :   232/26    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10589
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: McLeod Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -5.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 435.00 / 435.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)

Result summary (day)
--------------------

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
---------------------+---------+---------+---------
 1.Garner Rd         !     1.19 !    57.58 !    57.58
 2.McLeod Rd         !     1.19 !    24.85 !    24.85
---------------------+---------+---------+---------
                       Total                  57.58 dBA

Result summary (night)
----------------------
                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
---------------------+---------+---------+---------
 1.Garner Rd         !     1.20 !    51.15 !    51.15
 2.McLeod Rd         !     1.19 !    18.34 !    18.34
---------------------+---------+---------+---------
                       Total                  51.15 dBA
```

```
STAMSON 5.04        SUMMARY REPORT        Date: 09-07-2025 15:05:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2garner.te          Time Period: Day/Night 16/8 hours
Description: R2 Block A Unit 17 Upper East Facade 3rd Floor
                  TOTAL Leq FROM ALL SOURCES              (DAY): 53.02
                                                         (NIGHT): 46.59

Road data, segment # 1: Garner Rd (day/night)
----------------------------------------------
Car traffic volume  :  3309/368   veh/TimePeriod  *
Medium truck volume :    69/8     veh/TimePeriod  *
Heavy truck volume  :    69/8     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   2961
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Garner Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -0.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)

Road data, segment # 2: McLeod Rd (day/night)
---------------------------------------------
Car traffic volume  : 11152/1239  veh/TimePeriod  *
Medium truck volume :   232/26    veh/TimePeriod  *
Heavy truck volume  :   232/26    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10589
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: McLeod Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -5.00 deg   5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 435.00 / 435.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Garner Rd	1.19	53.00	53.00
2.McLeod Rd	1.19	30.36	30.36
Total			53.02 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Garner Rd	1.20	46.57	46.57
2.McLeod Rd	1.19	23.85	23.85
Total			46.59 dBA

```
STAMSON 5.04        SUMMARY REPORT        Date: 09-07-2025 15:09:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3garner.te          Time Period: Day/Night 16/8 hours
Description: R3 Block A Unit 18 Ground North Facade 1st Floor
                  TOTAL Leq FROM ALL SOURCES              (DAY): 51.12
                                                         (NIGHT): 44.69

Road data, segment # 1: Garner Rd (day/night)
----------------------------------------------
Car traffic volume  :  3309/368   veh/TimePeriod  *
Medium truck volume :    69/8     veh/TimePeriod  *
Heavy truck volume  :    69/8     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   2961
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Garner Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -0.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)

Road data, segment # 2: McLeod Rd (day/night)
---------------------------------------------
Car traffic volume  : 11152/1239  veh/TimePeriod  *
Medium truck volume :   232/26    veh/TimePeriod  *
Heavy truck volume  :   232/26    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10589
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: McLeod Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -5.00 deg   5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 434.00 / 434.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Garner Rd	1.19	51.10	51.10
2.McLeod Rd	1.19	27.88	27.88
Total			51.12 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Garner Rd	1.20	44.67	44.67
2.McLeod Rd	1.19	21.37	21.37
Total			44.69 dBA

```
STAMSON 5.04        SUMMARY REPORT        Date: 09-07-2025 15:12:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4garner.te          Time Period: Day/Night 16/8 hours
Description: R4 Block A Unit 17 Upper North Facade 3rd Floor
                  TOTAL Leq FROM ALL SOURCES              (DAY): 51.58
                                                         (NIGHT): 45.16

Road data, segment # 1: Garner Rd (day/night)
----------------------------------------------
Car traffic volume  :  3309/368   veh/TimePeriod  *
Medium truck volume :    69/8     veh/TimePeriod  *
Heavy truck volume  :    69/8     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   2961
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Garner Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -0.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)

Road data, segment # 2: McLeod Rd (day/night)
---------------------------------------------
Car traffic volume  : 11152/1239  veh/TimePeriod  *
Medium truck volume :   232/26    veh/TimePeriod  *
Heavy truck volume  :   232/26    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10589
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: McLeod Rd (day/night)
-------------------------------------------
Angle1   Angle2           :  -5.00 deg   5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 434.00 / 434.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no
barrier)
```

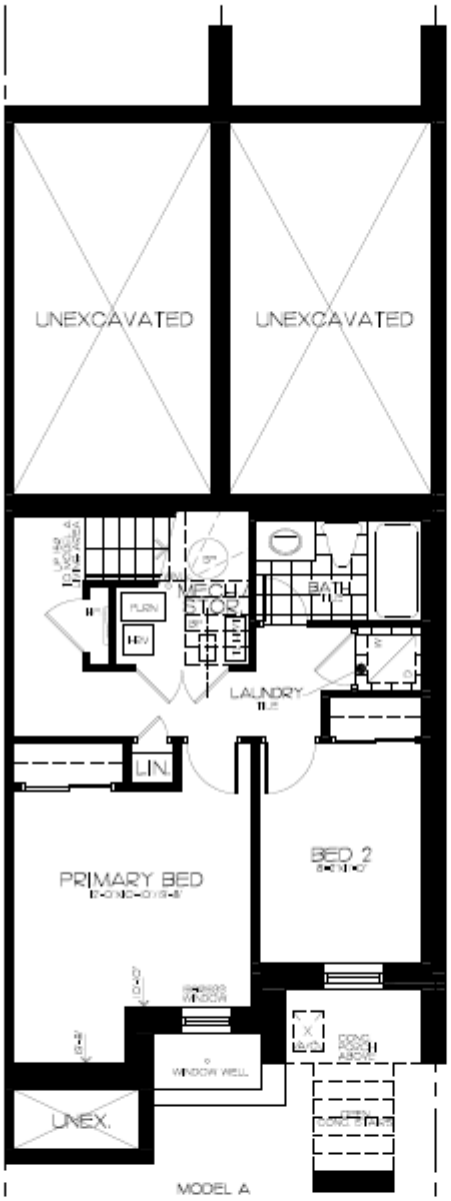
Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Garner Rd	1.19	51.55	51.55
2.McLeod Rd	1.19	30.38	30.38
Total			51.58 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Garner Rd	1.20	45.13	45.13
2.McLeod Rd	1.19	23.87	23.87
Total			45.16 dBA

FLOOR PLANS



MODEL A

BASEMENT PLAN
END MODEL A

MODEL A
GROUND FLOOR AREA = 374.30 S.F.
BASEMENT FLOOR AREA = 494.60 S.F.
TOTAL AREA = 868.90 S.F. (80.72 M2)

MODEL B
GROUND FLOOR AREA = 123.30 S.F.
SECOND FLOOR AREA = 388.90 S.F.
UPPER FLOOR AREA = 464.30 S.F.
TOTAL AREA = 976.50 S.F. (90.72 M2)

MODEL C
GROUND FLOOR AREA = 149.70 S.F.
SECOND FLOOR AREA = 419 S.F.
UPPER FLOOR AREA = 389.50 S.F.
TOTAL AREA = 958.20 S.F. (89 M2)

DATE:

DESIGN DRAWINGS APPROVED BY:

PRINT:

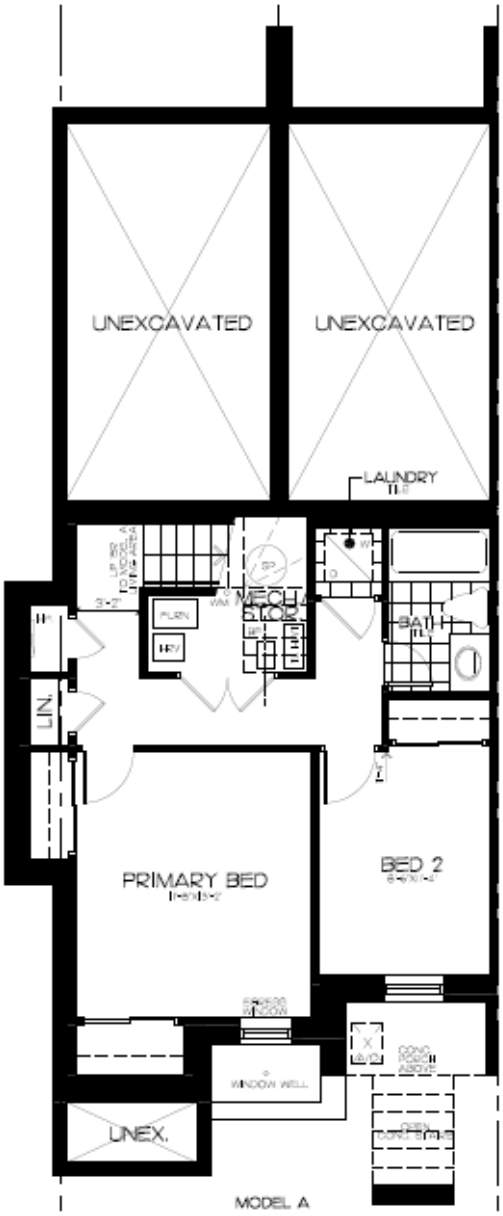
SIGN:

NOTE: FLOOR PLANS & ELEVATIONS ARE FOR LAYOUT PURPOSE ONLY. AREA, DIMENSIONS & ROOM SIZES MAY VARY. ALL CHANGES & EXTRAS AS PER BUILDER PURCHASE & SALES AGREEMENT

Jansen Consulting
70 Main Street N, P.O. Box 38
Campbellville, ON, L0P 1B0
Ph. 905-854-9696
Fax: 905-854-9559
Cell 905-815-3438
EMAIL : jeffjansendesign@gmail.com

OWNERS INFORMATION :
7525 GARNER ROAD
NIAGARA FALLS, ON

D01



BASEMENT PLAN
FLANKAGE MODEL A

MODEL A

GROUND FLOOR AREA = 409.30 S.F.
BASEMENT FLOOR AREA = 529.60 S.F.
TOTAL AREA = 938.90 S.F. (87.22 M2)

MODEL B

GROUND FLOOR AREA = 123.30 S.F.
SECOND FLOOR AREA = 423.90 S.F.
UPPER FLOOR AREA = 499.30 S.F.
TOTAL AREA = 1046.50 S.F. (97.22 M2)

MODEL C

GROUND FLOOR AREA = 149.70 S.F.
SECOND FLOOR AREA = 419 S.F.
UPPER FLOOR AREA = 389.50 S.F.
TOTAL AREA = 958.20 S.F. (89 M2)

DATE:
DESIGN DRAWINGS APPROVED BY:
PRINT:
SIGN:

NOTE: FLOOR PLANS & ELEVATIONS ARE FOR LAYOUT PURPOSE ONLY. AREA, DIMENSIONS & ROOM SIZES MAY VARY. ALL CHANGES & EXTRAS AS PER BUILDER PURCHASE & SALES AGREEMENT

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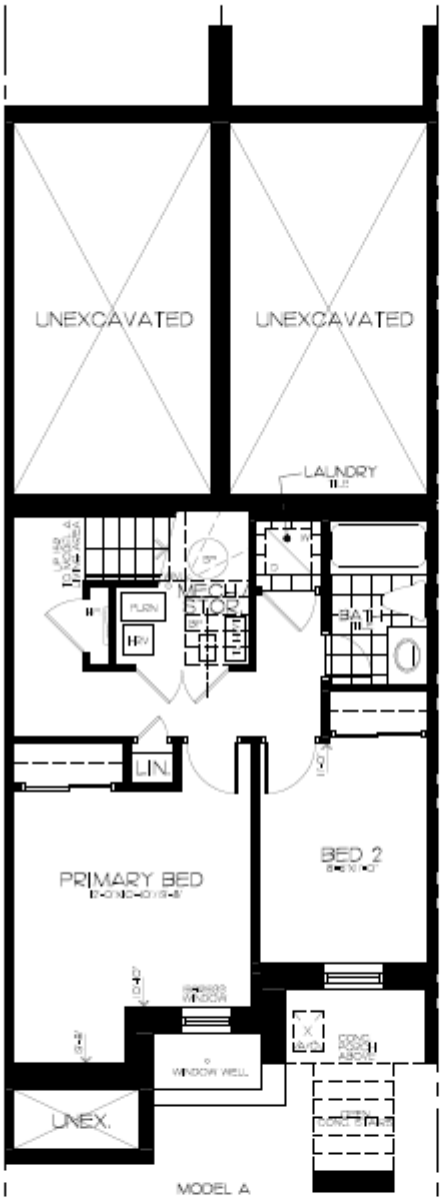
Campbellville, ON, L0P 1B0
Ph. 905-854-9696
Fax 905-854-9859
Cell 905-815-3438
EMAIL : jeffjansendesign@gmail.com

OWNERS INFORMATION :
7525 GARNER ROAD
NIAGARA FALLS, ON

D01



BASEMENT PLAN
INTERIOR MODEL A

MODEL A

GROUND FLOOR AREA = 374.30 S.F.
BASEMENT FLOOR AREA = 494.60 S.F.
TOTAL AREA = 868.90 S.F. (80.72 M2)

MODEL B

GROUND FLOOR AREA = 123.30 S.F.
SECOND FLOOR AREA = 388.90 S.F.
UPPER FLOOR AREA = 464.30 S.F.
TOTAL AREA = 976.50 S.F. (90.72 M2)

MODEL C

GROUND FLOOR AREA = 149.70 S.F.
SECOND FLOOR AREA = 419 S.F.
UPPER FLOOR AREA = 389.50 S.F.
TOTAL AREA = 958.20 S.F. (89 M2)

DATE:
DESIGN DRAWINGS APPROVED BY:
PRINT:
SIGN:

NOTE: FLOOR PLANS & ELEVATIONS ARE FOR LAYOUT PURPOSE ONLY. AREA, DIMENSIONS & ROOM SIZES MAY VARY. ALL CHANGES & EXTRAS AS PER BUILDER PURCHASE & SALES AGREEMENT

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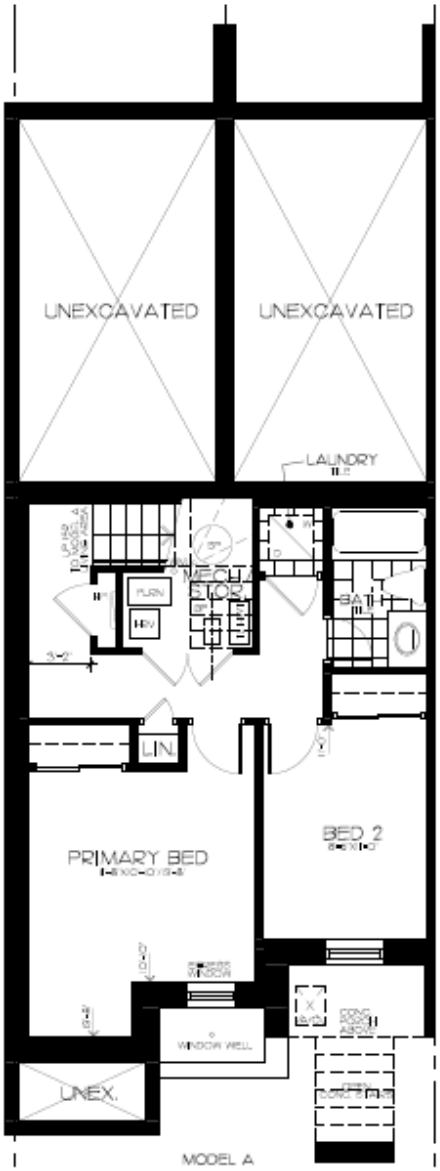
Campbellville, ON, L0P 1B0
Ph. 905-854-9696
Fax 905-854-9559
Cell 905-815-3438
EMAIL : jeffjansendesign@gmail.com

OWNERS INFORMATION :
7525 GARNER ROAD
NIAGARA FALLS, ON

D01



BASEMENT PLAN
END MODEL A

MODEL A
GROUND FLOOR AREA = 574.30 S.F.
BASEMENT FLOOR AREA = 494.60 S.F.
TOTAL AREA = 868.90 S.F. (80.72 M2)

MODEL B
GROUND FLOOR AREA = 123.30 S.F.
SECOND FLOOR AREA = 388.90 S.F.
UPPER FLOOR AREA = 464.30 S.F.
TOTAL AREA = 976.50 S.F. (90.72 M2)

MODEL C
GROUND FLOOR AREA = 149.70 S.F.
SECOND FLOOR AREA = 419 S.F.
UPPER FLOOR AREA = 389.50 S.F.
TOTAL AREA = 958.20 S.F. (89 M2)

DATE:
DESIGN DRAWINGS APPROVED BY:
PRINT:
SIGN:

NOTE: FLOOR PLANS & ELEVATIONS ARE FOR LAYOUT PURPOSE ONLY. AREA, DIMENSIONS & ROOM SIZES MAY VARY. ALL CHANGES & EXTRAS AS PER BUILDER PURCHASE & SALES AGREEMENT

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Ph: 905-854-9696
Fax: 905-854-9559
Cell: 905-815-3438
EMAIL : jeff@jcdesign@gmail.com

OWNERS INFORMATION :
7525 GARNER ROAD
NIAGARA FALLS, ON

D01

ELEVATIONS


ELEV. B / STD
UNIT 1, 2, 3
END UNIT
ELEV. B / REV
UNIT 4, 5, 6
ELEV. A / STD
UNIT 7, 8, 9
ELEV. A / REV
UNIT 10, 11, 12
ELEV. B / STD
UNIT 13, 14, 15
ELEV. B / REV
UNIT 16, 17, 18
FLANKAGE UNIT
FRONT ELEVATION - BLOCK A
ELEV. B / REV
UNIT 16, 17, 18
FLANKAGE UNIT
ELEV. B / STD
UNIT 13, 14, 15
ELEV. A / REV
UNIT 10, 11, 12
ELEV. A / STD
UNIT 7, 8, 9
ELEV. B / REV
UNIT 4, 5, 6
ELEV. B / STD
UNIT 1, 2, 3
END UNIT
REAR ELEVATION - BLOCK A
CONSTRUCTION NOTES
TYPE: TOWNHOUSES
FRONT ELEVATION
REAR ELEVATION

EXTERIOR WALL STC RATING

EXTERIOR WALL STC RATINGS

Wall Configuration	EW1	EW2	EW3	EW4	EW1R	EW2R	EW3R	EW5	EW4R	EW6	EW7 EW5R	EW8
STC Rating	**38**	**40**	**43**	**46**	**47**	**48**	**49**	**54**	**55**	**57**	**58**	**62**

Source: National Research Council, Division of Building Research

NOTES:

1 The common structure of walls EW1 to EW5 is composed of 12.7mm gypsum board, vapour barrier and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.

- EW1 denotes the common structure, plus sheathing, plus wood siding or metal siding and fibre backer board
- EW2 denotes the common structure, plus rigid insulation (25 to 30 mm), and wood siding or metal siding and fibre backer board.
- EW3 denotes simulated mansard with the common structure, plus sheathing, 28 X89 mm framing, sheathing and asphalt roofing material
- EW4 denotes the common structure, plus sheathing and 20 mm stucco.
- EW5 denotes the common structure, plus sheathing, 25 mm air space, 100mm brick veneer.
- EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 100 mm back-up block 100 mm face brick.
- EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 140mm back-up block, 100 mm face brick.
- EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 200 mm concrete.

2 R signifies the mounting of the interior gypsum board on resilient clips.

3 An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25 to 50 mm), 25 mm air space, and 100 mm brick veneer has the same STC as EW6.

4 An exterior wall described in EW1 with the addition of rigid insulation (25 to 50 mm) between the sheathing and the external finish has the same STC as EW2.

APPENDIX "B"

Content Copy Of Original

Ontario
Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 9547-C5ULRS
Issue Date: February 3, 2022

Cytec Canada Inc.
9061 Garner Rd
Niagara Falls,
Ontario L2H
0Y2

Site Location: Cytec Canada Inc.
9061 Garner Rd
Niagara Falls City, Regional Municipality of
Niagara L2E 6S5

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act , R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Description Section

A phosphine and phosphine derivatives facility, consisting of the following processes and support units:

- Phosphine Plant including derivatives section;
- Purification, mixing and packaging; and;
- Research and development pilot plant; **and the following *Equipment with Specific Operational Limits* :**

- one (1) emergency flare located in the phosphine building equipped with a natural gas fired continuous pilot burner system having a maximum thermal input of 142,290 kilojoules per hour combined for the three burner units, used to burn spills, releases from safety valves, rupture disk type vents and vapour headspace in reaction vessels from Train 1 operations. Under the worst case upset, the flare combusts pyrophoric waste gas originating from a safety valve of an autoclave, having a maximum volumetric flow rate of 1,262 standard cubic metres per minute;
- one (1) emergency flare located in the flare and thermal oxidizer building equipped with a natural gas fired continuous pilot burner system having a maximum thermal input of 1,106,700 kilojoules per hour combined for the three burner units, used to burn spills,

releases from safety valves, rupture disk type vents and vapour headspace in reaction vessels from Train 2 operations. Under the worst case upset, the flare combusts pyrophoric waste gas originating from a safety valve of an autoclave, having a maximum volumetric flow rate of 1,262 standard cubic metres per minute;

- one (1) natural gas fired thermal oxidizer serving Train 1, designed for a maximum heat input of 7,157,000 kilojoules per hour equipped with a natural gas fired burner used to incinerate the following streams:
  - waste gas comprising of phosphine, nitrogen, isobutylene, butene, low levels of all raw materials and phosphine compounds from the vessel vapour headspaces, having a maximum volumetric flow rate of 4.39 standard cubic metres per minute;
  - waste organic liquid, a mixture of organic solvents and phosphine derivatives, consisting of toluene, isopropyl alcohol mixture, octene, organophosphines, diisobutylene, tri-isobutyl phosphine, methyl tosylate, cyclooctadiene, hexene and isopar-M, having a maximum flow rate of 2.5 litres per minute; and
  - waste aqueous having a volumetric flow rate of 7.57 litres per minute.

  The thermal oxidizer operates at a temperature of 871 degrees Celsius with a minimum gas residence time of 2 seconds and is equipped with a continuous monitoring and recording system, a quench section, a venturi scrubber and a mist eliminator comprising of polyester fiber filters, having a dust removal efficiency of not less than 90 percent. The thermal oxidizer temperature will drop to 843 degrees Celsius during swings in operation before the waste organic liquid is shut off;
- one (1) natural gas fired thermal oxidizer serving Train 2, designed for a maximum heat input of 10,736,000 kilojoules per hour equipped with a natural gas fired burner, used to incinerate the following streams:
  - waste gas comprising of phosphine, nitrogen, isobutylene, butene, low levels of all raw materials and phosphine compounds from the vessel vapour headspaces, having a maximum volumetric flow rate of 4.39 standard cubic metres per minute;
  - waste organic liquid, a mixture of organic solvents and phosphine derivatives, consisting of toluene, isopropyl alcohol mixture, octene, organophosphines, diisobutylene, tri-isobutyl phosphine, methyl tosylate, cyclooctadiene, hexene and isopar-M, having a maximum flow rate of 3.75 litres per minute; and
  - waste aqueous having a volumetric flow rate of 11.4 litres per minute.

  The thermal oxidizer operates at a temperature of 871 degrees Celsius and a minimum gas residence time of 2 seconds, and is equipped with a continuous monitoring and recording system, a quench section, a venturi scrubber and a mist eliminator comprising of polyester fiber filters, having a dust removal efficiency of not less than 90 percent. The thermal oxidizer will drop to 843 degrees Celsius during swings in operation before the waste organic liquid is shut off;
- two (2) natural gas fired boilers located in the steam plant, each having a total maximum heat input of 13,900,000 kilojoules per hour;
- two (2) natural gas fired boilers located in the utilities building, each having a total maximum heat input of 22,051,788 kilojoules per hour; including the Equipment and any other ancillary and support processes and activities, operating at a Facility Production

Limit of up to **40,000 tonnes of phosphine based chemicals per year** discharging to the air as described in the Original ESDM Report.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "ACB list" means the document entitled "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", as amended from time to time and published by the Ministry and available on a Government website;
2. "Acceptable Point of Impingement Concentration" means a concentration accepted by the Ministry as not likely to cause an adverse effect for a Compound of Concern that,
   a. is not identified in the ACB list, or
   b. is identified in the ACB list as belonging to the category "Benchmark 2" and has a concentration at a Point of Impingement that exceeds the concentration set out for the contaminant in that document.

With respect to the Original ESDM Report, the Acceptable Point of Impingement Concentration for a Compound of Concern mentioned above is the concentration set out in the Original ESDM Report;

3. "Acoustic Assessment Report" means the report, prepared in accordance with Publication NPC-233 and Appendix A of the Basic Comprehensive User Guide, by Slavi Grozev, P.Eng. / RWDI AIR Inc. and dated October 7, 2021 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility, as updated in accordance with Condition 5 of this Approval;
4. "Acoustic Assessment Summary Table" means a table prepared in accordance with the Basic Comprehensive User Guide summarising the results of the Acoustic Assessment Report, as updated in accordance with Condition 5 of this Approval;
5. "Approval" means this entire Environmental Compliance Approval and any Schedules to it;
6. "Basic Comprehensive User Guide" means the Ministry document titled "Basic Comprehensive Certificates of Approval (Air) User Guide" dated March 2011, as amended;
7. "Best Management Practices Plan for Facility Flares" means a document or a set of documents which describe record keeping and notification processes for Flaring Events at the Facility;
8. "Company" means **Cytec Canada Inc.** that is responsible for the construction or operation of the Facility and includes any successors and assigns in accordance with section 19 of the EPA;

9. "Compound of Concern" means a contaminant described in paragraph 4 subsection 26 (1) of O. Reg. 419/05, namely, a contaminant that is discharged from the Facility in an amount that is not negligible;
10. "Description Section" means the section on page one of this Approval describing the Company's operations and the Equipment located at the Facility and specifying the Facility Production Limit for the Facility;
11. "Director" means a person appointed for the purpose of section 20.3 of the EPA by the Minister pursuant to section 5 of the EPA;
12. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located;
13. "Emission Summary Table" means a table described in paragraph 14 of subsection 26 (1) of O. Reg. 419/05;
14. "Environmental Assessment Act" means the *Environmental Assessment Act,* R.S.O. 1990, c.E.18;
15. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19;
16. "Equipment" means equipment or processes described in the ESDM Report, this Approval and in the Schedules referred to herein and any other equipment or processes;
17. "Equipment with Specific Operational Limits" means emergency flares, natural gas fired thermal oxidizers, natural gas fired boilers each with a heat input greater than 10.5 gigajoules per hour and any Equipment related to the thermal oxidation of waste or waste derived fuels, fume incinerators or any other Equipment that is specifically referenced in any published Ministry document that outlines specific operational guidance that must be considered by the Director in issuing an Approval;
18. "ESDM Report" means the most current Emission Summary and Dispersion Modelling Report that describes the Facility. The ESDM Report is based on the Original ESDM Report and is updated after the issuance of this Approval in accordance with section 26 of O. Reg. 419/05 and the Procedure Document;
19. "Facility" means the entire operation located on the property where the Equipment is located;
20. "Facility Production Limit" means the production limit placed by the Director on the main product(s) or raw materials used by the Facility;
21. "Flaring Event" means the operation of an emergency flare that was reported to the Ministry's Spills Action Centre and/or the discharge of greater than 10 kilograms of phosphine (CAS no.7803-51-2) to an emergency flare;
22. "Log" means a document that contains a record of each change that is required to be made to the ESDM Report and Acoustic Assessment Report, including the date on which the change occurred. For example, a record would have to be made of a more accurate emission rate for a source of contaminant, more accurate meteorological data, a more accurate value of a parameter that is related to a source of contaminant, a change to a

Point of Impingement and all changes to information associated with a Modification to the Facility that satisfies Condition 2;

23. "Low Flow Event" means a discharge of phosphine (CAS no.7803-51-2) to flare other than a Flaring Event and includes low flow and/or low volume discharges to flare;
24. "Minister" means the Minister of the Environment, Conservation and Parks or such other member of the Executive Council as may be assigned the administration of the EPA under the Executive Council Act;
25. "Ministry" means the ministry of the Minister;
26. "Modification" means any construction, alteration, extension or replacement of any plant, structure, equipment, apparatus, mechanism or thing, or alteration of a process or rate of production at the Facility that may discharge or alter the rate or manner of discharge of a Compound of Concern to the air or discharge or alter noise or vibration emissions from the Facility;
27. "Noise Control Measures" means measures to reduce the noise emissions from the Facility and/or Equipment including, but not limited to, silencers, acoustic louvres, enclosures, absorptive treatment, plenums and barriers;
28. "O. Reg. 419/05" means Ontario Regulation 419/05: Air Pollution – Local Air Quality, made under the EPA;
29. "Original ESDM Report" means the Emission Summary and Dispersion Modelling Report which was prepared in accordance with section 26 of O. Reg. 419/05 and the Procedure Document by RWDI AIR Inc. and dated September 30, 2020 submitted in support of the application, and includes any changes to the report made up to the date of issuance of this Approval;
30. "Point of Impingement" has the same meaning as in section 2 of O. Reg. 419/05;
31. "Point of Reception" means Point of Reception as defined by Publication NPC300;
32. "Procedure Document" means Ministry guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2018, as amended;
33. "Processes with Significant Environmental Aspects" means the Equipment which, during regular operation, would discharge one or more contaminants into the air in an amount which is not considered as negligible in accordance with section 26 (1)
    4 of O. Reg. 419/05 and the Procedure Document;
34. "Publication NPC-207" means the Ministry draft technical publication "Impulse Vibration in Residential Buildings", November 1983, supplementing the Model
    Municipal Noise Control By-Law, Final Report, published by the Ministry, August 1978, as amended;
35. "Publication NPC-233" means the Ministry Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995, as amended;

36. "Publication NPC-300" means the Ministry Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended;
37. "*Report EPS 1/PG/7"* means the report titled "Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Power Generation" dated December 2005 and published by Environment Canada, as amended.
38. "Schedules" means the following schedules attached to this Approval and forming part of this Approval namely:
    - Schedule A - Supporting Documentation
    - Schedule B - Continuous Temperature Monitor and Recorder;
    - Schedule C - Carbon Monoxide Monitor and Recorder;
    - Schedule D - Continuous Oxygen Monitor and Recorder; and
    - Schedule E - Flaring Event Emission Summary and Dispersion Modelling Report.
39. "Thermal Oxidizers" means the two (2) thermal oxidizers (referenced in the Original ESDM Report as sources 74 and AH) each equipped with a quenched section, venturi scrubber and mist eliminator, described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;
40. "Toxicologist" means a qualified professional currently active in the field of risk assessment and toxicology that has a combination of formal university education, training and experience necessary to assess contaminants; and
41. "Written Summary Form" means the electronic questionnaire form, available on the Ministry website, and supporting documentation, that documents the activities undertaken at the Facility in the previous calendar year.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

1. Except as otherwise provided by this Approval, the Facility shall be designed, developed, built, operated and maintained in accordance with the terms and conditions of this Approval and in accordance with the following Schedules attached hereto:
    - Schedule A - Supporting Documentation
    - Schedule B - Continuous Temperature Monitor and Recorder;
    - Schedule C - Carbon Monoxide Monitor and Recorder;

- Schedule D - Continuous Oxygen Monitor and Recorder; and
- Schedule E - Flaring Event Emission Summary and Dispersion Modelling Report.

2. LIMITED OPERATIONAL FLEXIBILITY

1. Pursuant to section 20.6 (1) of the EPA and subject to Conditions 2.2 and 2.3 of this Approval, future construction, alterations, extensions or replacements are approved in this Approval if the future construction, alterations, extensions or replacements are Modifications to the Facility that:
   a. are within the scope of the operations of the Facility as described in the Description Section of this Approval;
   b. do not result in an increase of the Facility Production Limit above the level specified in the Description Section of this Approval; and
   c. result in compliance with the performance limits as specified in Condition 4.

2. Condition 2.1 does not apply to,
   a. the addition of any new Equipment with Specific Operational Limits or to the Modification of any existing Equipment with Specific Operational Limits at the Facility; and
   b. Modifications to the Facility that would be subject to the Environmental Assessment Act.

3. Condition 2.1 of this Approval shall expire December 19, 2027, unless this Approval is revoked prior to the expiry date. The Company may apply for renewal of Condition 2.1 of this Approval by including an ESDM Report and an Acoustic Assessment Report that describes the Facility as of the date of the renewal application.

3. REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION

1. Prior to making a Modification to the Facility that satisfies Condition 2.1.a. and 2.1.b., the Company shall prepare a proposed update to the ESDM Report to reflect the proposed Modification.

2. The Company shall request approval of an Acceptable Point of Impingement Concentration for a Compound of Concern if the Compound of Concern is not identified in the ACB list as belonging to the category "Benchmark 1" and a proposed update to an ESDM Report indicates that one of the following changes with respect to the concentration of the Compound of Concern may occur:
   a. The Compound of Concern was not a Compound of Concern in the previous version of the ESDM Report and
      i. the concentration of the Compound of Concern exceeds the concentration set out for the contaminant in the ACB list; or

ii. the Compound of Concern is not identified in the ACB list; or

b. The concentration of the Compound of Concern in the updated ESDM Report exceeds the higher of,
   i. the most recent Acceptable Point of Impingement Concentration, and
   ii. the concentration set out for the contaminant in the ACB list, if the contaminant is identified in that document.

3. The request required by Condition 3.2 shall propose a concentration for the Compound of Concern and shall contain an assessment, performed by a Toxicologist, of the likelihood of the proposed concentration causing an adverse effect at Points of Impingement.
4. If the request required by Condition 3.2 is a result of a proposed Modification described in Condition 3.1, the Company shall submit the request, in writing, to the Director at least 30 days prior to commencing to make the Modification. The Director shall provide written confirmation of receipt of this request to the Company.
5. If a request is required to be made under Condition 3.2 in respect of a proposed Modification described in Condition 3.1, the Company shall not make the Modification mentioned in Condition 3.1 unless the request is approved in writing by the Director.
6. If the Director notifies the Company in writing that the Director does not approve the request, the Company shall,
   a. revise and resubmit the request; or
   b. notify the Director that it will not be making the Modification.
7. The re-submission mentioned in Condition 3.6 shall be deemed a new submission under Condition 3.2.
8. If the Director approves the request, the Company shall update the ESDM Report to reflect the Modification.
9. Condition 3 does not apply if Condition 2.1 has expired.

4. PERFORMANCE LIMITS

1. Subject to Condition 4.2, the Company shall not discharge or cause or permit the discharge of a Compound of Concern into the air if,
   a. the Compound of Concern is identified in the ACB list as belonging to the category "Benchmark 1" and the discharge results in the concentration at a Point of Impingement exceeding the Benchmark 1 concentration; or
   b. the Compound of Concern is not identified in the ACB list as belonging to the category “Benchmark 1” and the discharge results in the concentration at a Point of Impingement exceeding the higher of,

i. if an Acceptable Point of Impingement Concentration exists, the most recent Acceptable Point of Impingement Concentration, and

ii. the concentration set out for the contaminant in the ACB list, if the contaminant is identified in that document.

2. Condition 4.1 does not apply if the benchmark set out in the ACB list has a 10-minute averaging period and no ambient monitor indicates an exceedance at a Point of Impingement where human activities regularly occur at a time when those activities regularly occur.
3. The Company shall, at all times, ensure that the noise emissions from the Facility comply with the limits set out in Ministry Publication NPC-300.
4. The Company shall, at all times, ensure that the vibration emissions from the Facility comply with the limits set out in Ministry Publication NPC-207.
5. The Company shall operate any Equipment with Specific Operational Limits approved by this Approval in accordance with the Original ESDM Report and Conditions 7, 8, 10, 11 and 12 in this Approval.

5. DOCUMENTATION REQUIREMENTS

1. The Company shall maintain an up-to-date Log.
2. No later than March 31 in each year, the Company shall update the Acoustic Assessment Report and shall update the ESDM Report in accordance with section 26 of O. Reg. 419/05 so that the information in the reports is accurate as of December 31 in the previous year.
3. The Company shall make the Emission Summary Table (see section 27 of O. Reg. 419/05) and Acoustic Assessment Summary Table available for examination by any person, without charge, by posting it on the Internet or by making it available during regular business hours at the Facility.
4. The Company shall, within three (3) months after the expiry of Condition 2.1 of this Approval, update the ESDM Report and the Acoustic Assessment Report such that the information in the reports is accurate as of the date that Condition 2.1 of this Approval expired.
5. Conditions 5.1 and 5.2 do not apply if Condition 2.1 has expired.

6. REPORTING REQUIREMENTS

1. Subject to Condition 6.2, the Company shall provide the Director no later than June 30 of each year, a Written Summary Form to be submitted through the Ministry's website and by email to Environment.Niagara@ontario.ca that shall include the following:
   a. a declaration of whether the Facility was in compliance with section 9 of the EPA, O. Reg. 419/05 and the conditions of this Approval;

b. a summary of each Modification satisfying Condition 2.1.a. and 2.1.b. that took place in the previous calendar year that resulted in a change in the previously calculated concentration at a Point of Impingement for any Compound of Concern or resulted in a change in the sound levels reported in the Acoustic Assessment Summary Table at any Point of Reception.

2. Condition 6.1 does not apply if Condition 2.1 has expired.

7. OPERATION AND MAINTENANCE

1. The Company shall prepare and implement, not later than three (3) months from the date of this Approval, operating procedures and maintenance programs for all Processes with Significant Environmental Aspects, which shall specify as a minimum:
   a. frequency of inspections and scheduled preventative maintenance;
   b. procedures to prevent upset conditions;
   c. procedures to minimize all fugitive emissions;
   d. procedures to prevent and/or minimize odorous emissions;
   e. procedures to prevent and/or minimize noise emissions;
   f. procedures for record keeping activities relating to the operation and maintenance program;
   g. routine and emergency operating and maintenance procedures recommended by Thermal Oxidizers, the continuous monitoring and recording systems and emergency flares suppliers;
   h. calibration procedures of the continuous monitoring and recording systems;
   i. operator training which is to be provided by an individual experienced with Thermal Oxidizer Systems and emergency flares;
   j. procedures for optimizing the operation of the Thermal Oxidizers to minimize the emissions from the Thermal Oxidizers;
   k. periodic inspection of the Thermal Oxidizers which are to be conducted by individuals experienced with the Thermal Oxidizers;
   l. procedures for recording and responding to complaints regarding the operation of the Thermal Oxidizers;
   m. procedures to record the usage rate of chemicals in fume hoods; and
   n. The Company shall ensure that any Equipment subject to Guideline A-9 is operated in compliance with the requirements of Guideline A-9, and that the emissions of nitrogen oxides, expressed collectively as nitrogen dioxide equivalent, from the natural gas fired boilers having a maximum heat input greater than 10.5 gigajoules per hour, shall not exceed the nitrogen oxides emission limit of 26 grams per gigajoule of input fuel energy.

2. The Company shall ensure that the combustion chambers of each of the thermal oxidizers are not loaded unless the continuous temperature monitoring system is fully operational.
3. The Company shall ensure that no substances containing chlorinated and/or fluorinated and/or brominated compounds, including polyvinyl chloride and Teflon are combusted in the Thermal Oxidizers.
4. The Company shall ensure that all Processes with Significant Environmental Aspects are operated and maintained in accordance with this Approval, the operating procedures and maintenance programs.

8. FLARE OPERATIONS

1. The Company shall immediately implement the Best Management Practices Plan for Facility Flares entitled "Best Management Practices Plan (BMPP) for Facility Flares", dated January 27, 2022, as amended.
    a. The Company shall:
        i. review and evaluate on a yearly basis, the Best Management Practices Plan for Facility Flares; ii. record the results of each yearly review and update the Best Management Practices Plan for Facility Flares within two (2) months of the completion of the yearly review;
iii. maintain the updated Best Management Practices Plan for Facility Flares at the Facility; iv. implement, at all times, the most recent version of the Best Management Practices Plan for Facility Flares.

2. The Company shall notify the District Manager as soon as reasonably possible of each Flaring Event, and provide the following information following each Flaring Event as soon as reasonable possible:
    a. the start and end times of the Flaring Event;
    b. the type of gas sent to flare;
    c. estimated total volume and mass of gas sent to flare;
    d. the contaminants and the mass of each contaminant discharged during the Flaring Event;
    e. a summary of investigations conducted including an assessment of root causes and failure analyses linked to the Flaring Event;
    f. a summary of findings from investigations conducted;
    g. corrective actions taken to prevent future Flaring Events;
    h. any remaining actions and their proposed completion dates;
    i. wind direction/weather details at time of Flaring Event;
    j. available photos/video during the Flaring Event; and

k. details regarding if, when and how neighbours were notified of the Flaring Event.

3. The Company shall notify the District Manager as soon as reasonably possible of each Low Flow Event, and provide the following information following each Low Flow Event:
   a. the start and end times of the Low Flow Event;
   b. estimated total volume and mass of phosphine (CAS no.7803-51-2) sent to flare;
   c. the contaminants and the mass of each contaminant discharged during the Low Flow Event;
   d. a summary of investigations conducted including an assessment of root causes and failure analyses linked to the Low Flow Event;
   e. a summary of findings from investigations conducted;
   f. corrective actions taken to prevent future Low Flow Events;
   g. any remaining actions and their proposed completion dates;
   h. wind direction/weather details at time of Low Flow Event;
   i. available photos/video during the Low Flow Event; and
   j. details regarding if, when and how neighbours were notified of the Low Flow Event.

4. The Company shall prepare, at the end of each calendar quarter, and retain on-site for inspection by the Ministry, upon request, a report for the previous calendar quarter that includes at a minimum:
   a. a list of Flaring Events and Low Flow Events, provided in table format, including start and end times, type and total volume and mass of gas sent to flare, and the contaminants discharged during the events;
   b. a summary of the assessment of root cause and failure analyses;
   c. a summary of actions taken to prevent future Flaring Events and Low Flow Events;
   d. a summary of pending actions to be taken to prevent future Flaring Events and Low Flow Events; and
   e. as established within the Best Management Practices Plan for Facility Flares, a summary of efforts taken to notify local communities and other interested parties of Flaring Events and Low Flow Events.

5. The Company shall prepare, at the end of each calendar quarter, and provide to the District Manager a Flaring Event Emission Summary and Dispersion Modelling Report in accordance with section 26 of O.Reg. 419/05 and prepared in accordance with the requirements outlined in Schedule E. The Flaring Event Emission

Summary and Dispersion Modelling Report shall assess each Flaring Event during the previous calendar quarter, and shall be provided within 4 weeks of the receipt of, from the Ministry, local meteorological data reflective of meteorological and local land use conditions for each of the Flaring Events during the calendar quarter.

a. Despite subsection 5, the Director may waive in writing the requirement to assess a specific Flaring Event.

9. COMPLAINTS RECORDING AND REPORTING

1. If at any time, the Company receives an environmental complaint from the public regarding the operation of the Equipment approved by this Approval, the Company shall take the following steps:
   a. Record and number each complaint, either electronically or in a log book. The record shall include the following information: the time and date of the complaint and incident to which the complaint relates, the nature of the complaint, wind direction at the time and date of the incident to which the complaint relates and, if known, the address of the complainant.
   b. Notify the District Manager of the complaint within two (2) business days after the complaint is received, or in a manner acceptable to the District Manager.
   c. Initiate appropriate steps to determine all possible causes of the complaint, and take the necessary actions to appropriately deal with the cause of the subject matter of the complaint.
   d. Complete and retain on-site a report written within five (5) business days of the complaint date. The report shall list the actions taken to appropriately deal with the cause of the complaint and set out steps to be taken to avoid the recurrence of similar incidents.

10. RECORD KEEPING REQUIREMENTS

1. Any information requested by any employee in or agent of the Ministry concerning the Facility and its operation under this Approval, including, but not limited to, any records required to be kept by this Approval, shall be provided to the employee in or agent of the Ministry, upon request**,** in a timely manner.
2. Unless otherwise specified in this Approval, the Company shall retain, for a minimum of five (5) years from the date of their creation all reports, records and information described in this Approval, including,
   a. a copy of the Original ESDM Report and each updated version;
   b. a copy of each version of the Acoustic Assessment Report;
   c. supporting information used in the emission rate calculations performed in the ESDM Reports and Acoustic Assessment Reports;
   d. the records in the Log;
   e. copies of each Written Summary Form provided to the Ministry under

Condition 6.1 of this Approval;

f. records of maintenance, repair and inspection of Equipment related to all Processes with Significant Environmental Aspects;
g. all records on maintenance, repair and inspection of the continuous monitoring and recording system, and original date that work was recommended;
h. all records produced by the continuous monitoring and recording system;
i. all records on operators training;
j. all records of the usage rate of chemicals in fumehoods;
k. description of all upset conditions associated with the operation of the Thermal Oxidizers and remedial action taken; and
l. all records related to environmental complaints made by the public as required by Condition 9 of this Approval.

11. EQUIPMENT WITH SPECIFIC OPERATIONAL LIMITS

1. The Company shall ensure that the Thermal Oxidizers, used to incinerate waste gas, waste organic liquid and water containing organic are designed and operated to comply, at all times, with the following performance requirements:
   a. the temperature in the combustion chamber, as recorded by the continuous monitoring and recording system, shall be at least 871 degrees Celsius throughout the combustion cycle but may drop to 843 degrees Celsius during swings in operation before the waste organic liquid is shut off; and
   b. the minimum residence time of the combustion gases in the combustion chamber shall be 2.0 seconds, operating at a temperature of not less than 843 degrees Celsius.

12. CONTINUOUS MONITORING

1. The Company shall install, conduct and maintain a program to continuously monitor:
   a. the temperature at the location in the combustion chamber of the Train 1 Thermal Oxidizer where the minimum retention time of the combustion gases at a minimum temperature of 843 degrees Celsius at 2 seconds is achieved. The continuous monitoring and recording system shall be equipped with continuous recording devices, and shall comply with the requirements outlined in the attached Schedule B1. The continuous monitoring and recording system shall comply with the requirements outlined in the attached Schedule B2 by January 31, 2023.
   b. the temperature at the location in the combustion chamber of the Train 2

   Thermal Oxidizer where the minimum retention time of the combustion gases at a minimum temperature of 843 degrees Celsius at 2 seconds is achieved. The continuous monitoring and recording system shall be equipped with

continuous recording devices, and shall comply with the requirements outlined in the attached Schedule B2.

c. carbon monoxide at an accessible location where the measurements are representative of the actual concentrations of carbon monoxide in the gases leaving each of the Thermal Oxidizers. The continuous monitoring and recording system shall be equipped with continuous recording devices, and shall comply with the requirements outlined in the attached Schedule C.

d. oxygen at an accessible location where the measurements are representative of the actual concentrations of oxygen in the gases leaving each of the Thermal Oxidizers. The continuous monitoring and recording system shall be equipped with continuous recording devices, and shall comply with the requirements outlined in the attached Schedule D.

13. **REVOCATION OF PREVIOUS APPROVALS**

1. This Approval replaces and revokes all Certificates of Approval (Air) issued under section 9 EPA and Environmental Compliance Approvals issued under Part II.1 EPA to the Facility in regards to the activities mentioned in subsection 9(1) of the EPA and dated prior to the date of this Approval.

SCHEDULE A

Supporting Documentation

1. Environmental Compliance Approval Application, dated October 29, 2020, signed by Heidi Kelly and submitted by the *Company;*
2. Acoustic Assessment Report, prepared by Slavi Grozev, P.Eng., RWDI AIR Inc. and dated October 7, 2021;
3. Emission Summary and Dispersion Modelling Report, prepared by RWDI AIR Inc. and dated September 30, 2020;
4. The emails from Sharon Schajnoha, RWDI Air Inc. dated July 10, 11 and 24, 2017.
5. The letter dated March 10, 2017 and signed by Hedi Kelly, Health, Safety and Environmental Engineer, Cytec Canada Inc.; and
6. The letters (e-mails) dated March 10 and 13, 2017 and provided by Katie Allen and Sharon Schajnoha, RWDI AIR Inc.

SCHEDULE B1

Continuous Temperature Monitoring and Recording System Requirements

PARAMETER:

Temperature

LOCATION:

The sample point for the Continuous Temperature Monitoring and Recording system shall be located at a location where the measurements are representative of the minimum temperature of the gases leaving the combustion chamber of the Thermal Oxidizer.

PERFORMANCE:

The Continuous Temperature Monitoring system shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
Type	shielded "K" type thermocouple, or equivalent
Accuracy	± 1.5 percent of the minimum gas
	temperature

RECORDER:

The recorder must be capable of registering continuously the measurement of the monitoring system without a significant loss of accuracy and with a time resolution of 1 minute or better.

RELIABILITY:

The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the time for each calendar quarter.

SCHEDULE B2

Continuous Temperature Monitoring and Recording System Requirements

PARAMETER:

Temperature

LOCATION:

The sample point for the Continuous Temperature Monitoring and Recording system shall be located at a location where the measurements are representative of the minimum temperature of the gases leaving the combustion chamber of the Thermal Oxidizer.

PERFORMANCE:

The Continuous Temperature Monitoring system shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
Type	shielded "K" type thermocouple, or equivalent
Accuracy	± 1.5 percent of the minimum gas temperature
Response Time (95%)	60 sec. (max)
Operating Range (Full Scale)	1.5 times approval limit
Standard Tolerance	± 2.2 ºC or ± 0.75%
Resolution	0.1 ºC
Calibration	Per manufacturer's recommendations

RECORDER:

The recorder must be capable of registering continuously the measurement of the monitoring system without a significant loss of accuracy and with a time resolution of 1 minute or better.

RELIABILITY:

The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

SCHEDULE C

Carbon Monoxide Monitor and Recorder

PARAMETER:

Carbon Monoxide

INSTALLATION:

The continuous carbon monoxide monitor shall be installed at an accessible location where the measurements are representative of the actual concentrations of carbon monoxide in the gases leaving each of the Thermal Oxidizers and shall meet the following installation specifications:

PARAMETERS	SPECIFICATION
Range (parts per million, ppm)	0 to highest concentration anticipated from the source
Calibration Gas Ports	close to the sample point

PERFORMANCE:

The continuous carbon monoxide monitor shall meet the following minimum performance specifications for the following parameters:

PARAMETERS	SPECIFICATION
Span Value (nearest ppm equivalent)	2 times the average normal concentration of the source
Relative Accuracy	< 10 percent of the mean value of the reference method test
Calibration Error	< 2 percent of actual concentration
System Bias	< 4 percent of the mean value of the reference method test
Procedure for Zero and Span Calibration Check	all system components check
Zero Calibration Drift (24-hour)	< 5 percent of span value
Span Calibration Drift (24-hour)	< 5 percent of span value
Response Time (90 percent response to step change)	< 90 seconds

Operational Test Period	> 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded when each of the Thermal Oxidizers are operating and in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:

The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:

The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter when each of the Thermal Oxidizers is operating.

SCHEDULE D

Continuous Oxygen Monitor and Recorder

INSTALLATION:

The continuous oxygen monitor shall be installed at an accessible location where the measurements are representative of the actual concentrations of oxygen in the gases leaving each of the Thermal Oxidizers and shall meet the following installation specifications:

PARAMETERS	SPECIFICATION
Range (percentage)	0 to highest concentration anticipated from the source
Calibration Gas Ports	close to the sample point

PERFORMANCE:
The continuous oxygen monitor shall meet the following minimum performance specifications for the following parameters:

PARAMETERS	SPECIFICATION
Span Value (percentage)	2 times the average normal concentration of the source
Relative Accuracy	< 10 percent of the mean value of the reference method test
Calibration Error	0.25 percent O2
System Bias	< 4 percent of the mean value of the reference method test
Procedure for Zero and Span Calibration Check	all system components checked
Zero Calibration Drift (24-hour)	< 0.5 percent O2
Span Calibration Drift (24-hour)	< 0.5 percent O2
Response Time (90 percent of full scale)	< 90 seconds
Operational Test Period	> 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded when each of the Thermal Oxidizers is operating and in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:

The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:

The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter when each of the Thermal Oxidizers is operating.

SCHEDULE E

Flaring Event Emission Summary and Dispersion Modelling Report

1. A Flaring Event Emission Summary and Dispersion Modelling Report required by condition 8.5. shall be prepared in accordance with the following requirements:

2. The Flaring Event Emission Summary and Dispersion Modelling Report need only be prepared with respect to discharges of Phosphine, Phosphorous Pentoxide and Phosphoric Acid during each Flaring Event and need not list all contaminants that are discharged from the Facility, despite anything to the contrary in section 26 of O.Reg. 419/05; the Flaring Event Emission Summary and Dispersion Modelling Report must include all discharges of these contaminants from all sources of these contaminants at the Facility in accordance with section 3 and 26 of O.Reg. 419/05;

3. The Flaring Event Emission Summary and Dispersion Modelling Report shall be prepared with respect to each discharge of Phosphine, Phosphorous Pentoxide and Phosphoric Acid for 1-hour and 24-hour averaging periods for each Flaring Event;

4. Despite Section 10 of O.Reg. 419/05, an approved dispersion model shall be used in accordance with a scenario that uses actual operating data for the Facility during each Flaring Event;

5. Despite Section 11 of O.Reg. 419/05, an approved dispersion model shall be used with an emission rate that is an accurate reflection of the emission rate of each contaminant during each Flaring Event, reflected through the use and input of variable emissions by hour;

6. Where the Flaring Event Emission Summary and Dispersion Modelling Report is being prepared with respect to a 1-hour averaging period, the rolling hour during each Flaring Event that would result in the highest concentration of the contaminant at a Point of Impingement must be used; and

7. The approved dispersion model shall be used with local meteorological data approved under paragraph 3 of subsection 13 (1) of O.Reg. 419/05 as an accurate reflection of meteorological and local land use conditions during the period of each Flaring Event.

The reasons for the imposition of these terms and conditions are as follows:

1. **GENERAL**
   Condition No. 1 is included to require the Approval holder to build, operate and maintain the Facility in accordance with the Supporting Documentation in Schedule A considered by the Director in issuing this Approval.

2. LIMITED OPERATIONAL FLEXIBILITY, REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION AND PERFORMANCE LIMITS

Conditions No. 2, 3 and 4 are included to limit and define the Modifications permitted by this Approval, and to set out the circumstances in which the Company shall request approval of an Acceptable Point of Impingement Concentration prior to making Modifications. The holder of the Approval is approved for operational flexibility for the Facility that is consistent with the description of the operations included with the application up to the Facility Production Limit. In return for the operational flexibility, the Approval places performance based limits that cannot be exceeded under the terms of this Approval. Approval holders will still have to obtain other relevant approvals required to operate the Facility, including requirements under other environmental legislation such as the Environmental Assessment Act.

3. DOCUMENTATION REQUIREMENTS

Condition No. 5 is included to require the Company to maintain ongoing documentation that demonstrates compliance with the performance limits as specified in Condition 4 of this Approval and allows the Ministry to monitor ongoing compliance with these performance limits. The Company is required to have an up to date ESDM Report and Acoustic Assessment Report that describe the Facility at all times and make the Emission Summary Table and Acoustic Assessment Summary Table from these reports available to the public on an ongoing basis in order to maintain public communication with regard to the emissions from the Facility.

4. REPORTING REQUIREMENTS

Condition No. 6 is included to require the Company to provide a yearly Written Summary Form to the Ministry, to assist the Ministry with the review of the site's compliance with the EPA, the regulations and this Approval.

5. OPERATION AND MAINTENANCE

Condition No. 7 is included to require the Company to properly operate and maintain the Processes with Significant Environmental Aspects to minimize the impact to the environment from these processes.

6. FLARE OPERATIONS

Condition No. 8 is included to require the Company to develop documentation and maintain records that require best management practices to reduce the potential for Flaring Events.

7. COMPLAINTS RECORDING AND REPORTING PROCEDURE

Condition No. 9 is included to require the Company to respond to any environmental complaints regarding the operation of the Equipment, according to a procedure that includes methods for preventing recurrence of similar incidents and a requirement to prepare and retain a written report.

8. RECORD KEEPING REQUIREMENTS

Condition No. 10 is included to require the Company to retain all documentation related to this Approval and provide access to employees in or agents of the Ministry, upon request, so that the Ministry can determine if a more detailed review of compliance with the performance limits as specified in Condition 4 of this Approval is necessary.

9. EQUIPMENT WITH SPECIFIC OPERATIONAL LIMITS

Condition No. 11 is included to outline the specific operational limits considered necessary to prevent an adverse effect resulting from the operation of each of the Thermal

Oxidizers. This condition is also included to emphasize that the Thermal Oxidizers must be operated according to a procedure that will result in compliance with the EPA, the regulations and this Approval.

10. **CONTINUOUS MONITORING**
    Condition No. 12 is included to require the Company to gather accurate information on a continuous basis so that compliance with the EPA, the regulations and this Approval can be verified.
11. **REVOCATION OF PREVIOUS APPROVALS**
    Condition No. 13 is included to identify that this Approval replaces all Section 9 Certificate(s) of Approval and Part II.1 Approvals in regards to the activities mentioned in subsection 9(1) of the EPA and dated prior to the date of this Approval.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 1282-AQRMJB issued on December 19, 2017

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me, the Environmental Review Tribunal and in accordance with Section 47 of the Environmental Bill of Rights, 1993, the Minister of the Environment, Conservation and Parks, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Minister of the Environment, Conservation and Parks will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Minister of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto, Ontario
M7A 2J3

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or** www.ert.gov.on.ca

This instrument is subject to Section 38 of the Environmental Bill of Rights, 1993, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at https://ero.ontario.ca/, you can determine when the leave to appeal period ends.

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 3rd day of February, 2022

Bijal Shah,
P.Eng. Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

MS/

c: District Manager, MECP Niagara Heidi Kelly, Cytec Canada