

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4686-BNU7FF

Issue Date: February 18, 2021

NOVA Chemicals Corporation
Post Office Box, No. 3060
Sarnia, Ontario
N7T 8C7

Site Location: 804 Rokeby Line
St. Clair Township, County of Lambton
N0N 1M0

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:

- one (1) polyethylene production facility with a maximum annual production rate of 500,000 tonnes per year, consisting of equipment discharging to the air as described in Schedule "A" of this Approval;

all in accordance with the application dated February 11, 2020 and signed by Jill Ward, for amendment of Environmental Compliance Approval (Air & Noise) No. 5076-B9YMLT, and all supporting information associated with the application.

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

1. "Acoustic Assessment Report" means the report, prepared in accordance with Publication NPC-233 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility. "Acoustic Assessment Report" also means the Acoustic Assessment Report prepared by HGC Engineering, dated February 6, 2020 and signed by Corey Kinart, P.Eng. and the letters dated August 12, 2020 and November 6, 2020 and prepared by Corey Kinart, P.Eng.;
2. "Acoustic Audit" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the Facility, assessed to determine compliance with the performance limits for the Facility regarding noise emissions, completed in accordance with the procedures set in Publication NPC-103 and reported in accordance with Publication NPC-233;
3. "Acoustic Audit Report" means a report presenting the results of an Acoustic

Audit, prepared in accordance with Publication NPC-233;

4. "Acoustical Consultant" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;
5. "Approval" means this Environmental Compliance Approval, including the application and supporting documentation listed above;
6. "Company" means NOVA Chemicals Corporation that is responsible for the construction or operation of the Facility and includes any successors and assigns;
7. "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;
8. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located and in operation;
9. "EPA" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;
10. "Equipment" means the equipment described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;
11. "Facility" means the entire polyethylene facility operation located on the property where the Equipment is located;
12. "Independent Acoustical Consultant" means an Acoustical Consultant who is not representing the Company and was not involved in preparing the Acoustic Assessment Report or the design/implementation of Noise Control Measures for the Facility and/or Equipment. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment or the design/implementation of Noise Control Measures for the Facility and/or Equipment;
13. "Manager" means the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, as those duties relate to the conditions of this Approval;
14. "Manual" means a document or a set of documents that provide written instructions to staff of the Company;
15. "Ministry" means the ministry of the government of Ontario responsible for the EPA and includes all officials, employees or other persons acting on its behalf;

16. "Noise Control Measures" means measures to reduce the noise emission from the Facility and/or Equipment including, but not limited to, silencers, acoustic louvers, enclosures, absorptive treatment, plenums and barriers. It also means the noise control measures outlined in the Acoustic Assessment Report;
17. "O. Reg. 419/05" means Ontario Regulation 419/05, Air Pollution – Local Air Quality, as amended;
18. "Point of Impingement" means any point outside the facility in the natural environment and as defined by s.2 of O. Reg. 419/05;
19. "Pre-Test Plan" means a plan for the Source Testing including the information required in Section 5 of the Source Testing Code;
20. "Procedure Document" means *Ministry* guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report", dated February 2017, as amended;
21. "Publication NPC-103" means the Ministry Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, August 1978, published by the Ministry as amended;
22. "Publication NPC-233" means the Ministry Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995 as amended;
23. "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;
24. "Source Testing Code" means the Ontario Source Testing Code, dated June 2010, prepared by the Ministry, as amended;
25. "Source Testing" means sampling and testing to measure emissions resulting from operating the Thermal Oxidizer under conditions which yield the worst case emissions within the approved operating range of the Thermal Oxidizer which satisfies paragraph 1 of subsection 11(1) of O. Reg. 419/05;
26. "Thermal Oxidizer" means the vapour liquid combustion unit (VLCU) described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval.

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. OPERATION AND MAINTENANCE

1. The Company shall ensure that the Equipment is properly commissioned and post commissioning, the Equipment is properly operated and maintained at all times. The Company shall:
 - a. prepare, not later than three (3) months after the Equipment is commissioned, and update as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:
 - i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment supplier;
 - ii. emergency procedures;
 - iii. procedures for any record keeping activities relating to operation and maintenance of the Equipment;
 - iv. all appropriate measures to minimize noise, dust and odorous emissions from all potential sources; and
 - b. implement the recommendations of the Manual.

2. RECORD RETENTION

1. The Company shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this Approval, and make these records available for review by staff of the Ministry upon request. The Company shall retain:
 - a. all records on the maintenance, repair and inspection of the Equipment;
 - b. all records on the continuous monitoring and recording system for the Thermal Oxidizer; and
 - c. all records of any environmental complaints, including:
 - i. a description, time and date of each incident to which the complaint relates;
 - ii. wind direction at the time of the incident to which the complaint relates; and
 - iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

3. NOTIFICATION OF COMPLAINTS

1. The Company shall notify a Provincial Officer of the Sarnia District Office or

the District Manager, verbally, of each environmental complaint about the Facility's operations within two (2) business days of the complaint. The notification shall include:

- a. a description of the nature of the complaint; and
- b. the time and date of the incident to which the complaint relates.

4. PERFORMANCE

1. The Company shall ensure that the Thermal Oxidizer is designed and operated to comply with the following requirements:
 - a. The combustion chamber of the Thermal Oxidizer shall be preheated to a minimum of 871 degrees Celsius, as measured by the continuous monitoring and recording system, prior to introducing the process exhaust gases;
 - b. The temperature in the combustion chamber of the Thermal Oxidizer, is maintained at a minimum of 871 degrees Celsius, as measured by the continuous monitoring and recording system, at all times, when the Thermal Oxidizer is in operation;
 - c. The residence time of the combustion gases in the combustion chamber of the Thermal Oxidizer shall not be less than 0.75 seconds at a temperature of 871 degrees Celsius minimum; and
 - d. The concentration of total hydrocarbons in the exhaust gas emitted from the Thermal Oxidizer, having a carbon content expressed as equivalent methane, being an average of ten measurements taken at approximately one minute intervals, shall not be greater than 100 parts per million by volume.

5. MONITORING

1. The Company shall monitor the emission and operation of the Thermal Oxidizer as follows:
 - a. The Company shall perform Source Testing once to determine the rate of ethylene emission from the Thermal Oxidizer stack, after the commencement of the Thermal Oxidizer operation.
 - b. The Company shall submit, not later than two (2) months prior to the commencement of operation of the Thermal Oxidizer, to the Manager a test protocol, including the Pre-Test Plan required by the Source Testing Code. The Company shall finalize the Pre-Test Plan in consultation with the Manager.
 - c. The Company shall not commence the Source Testing until the Manager has accepted the Pre-Test Plan.

- d. The Company shall complete the Source Testing required by Condition No. 5.1.a. not later than three (3) months after the Manager has accepted the Pre-Test Plan, or not later than nine (9) months after the commencement of operation of the Thermal Oxidizer, whichever comes later.
- e. The Company shall notify the District Manager, the Manager and the Director in writing of the location, date and time of any impending Source Testing required by this Approval, at least fifteen (15) days prior to the Source Testing.
- f. The Company shall submit a report on the Source Testing to the District Manager, the Manager and the Director not later than three (3) months after completing the Source Testing. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:
 - i. an executive summary;
 - ii. records of operating conditions;
 - iii. the emission rate of ethylene from the Thermal Oxidizer determined by the Source Testing;
 - iv. the results of dispersion calculations in accordance with Regulation 419 indicating the maximum concentration of the ethylene at the Point of Impingement, based on the ethylene emission rate determined by the Source Testing and emission rates estimated for all other ethylene emission sources from the Facility and from the NOVA Chemicals Corporation. petrochemical facility with a municipal address of 785 Petrolia Line, Corunna, Ontario. ; and
 - v. a tabular comparison of Source Testing results on ethylene emission rate and maximum Point of Impingement concentration for the Thermal Oxidizer to original emission estimates described in the Company's application and the ESDM Report.
- g. The Director may not accept the results of the Source Testing if:
 - i. the Source Testing Code or the requirements of the Manager were not followed;
 - ii. the Company did not notify the District Manager, the Manager and the Director of the Source Testing; and
 - iii. the Company failed to provide a complete report on the Source Testing.
- h. If the Director does not accept the results of the Source Testing, the

Director may require re-testing. If re-testing is required, the Pre-Test Plan strategies need to be revised and submitted to the Manager for approval. The actions taken to minimize the possibility of the Source Testing results not being accepted by the Director must be noted in the revised Pre-Test Plan submission to the Manager.

- i. If the Source Testing results indicate the emission estimates are higher than the original emission estimates described in the Company's application and the ESDM Report, the Company shall update their ESDM Report in accordance with Section 26 of O. Reg. 419/05 with the emission estimates from the *source testing* report and make these records available for review by staff of the Ministry upon request. The updated Emission Summary Table from the updated ESDM Report shall be submitted with the report on the Source Testing.
2. The Company shall continuously monitor and record the temperature in the combustion chamber of the Thermal Oxidizer, when the Thermal Oxidizer is in operation. The temperature monitor and recorder shall comply with the requirements outlined in Schedule "B".

6. NOISE

1. The Company shall:
 - a. implement, prior to the commencement of operation of the Facility, the Noise Control Measures as outlined in the Acoustic Assessment Report;
 - b. ensure, subsequent to the implementation of the Noise Control Measures, that the noise emissions from the Facility comply with the limits set in Ministry Publication NPC-300; and
 - c. ensure that the Noise Control Measures are properly maintained and continue to provide the acoustical performance outlined in the Acoustic Assessment Report.

7. ACOUSTIC AUDIT

1. The Company shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Company:
 - a. shall carry out Acoustic Audit measurements in accordance with the procedures in Publication NPC-103;
 - b. shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of Publication NPC-233, to the District Manager and the Director not later than nine (9) months after the commencement of operation of the Facility.

2. The Director:
 - a. may not accept the results of the Acoustic Audit if the requirements of Publication NPC-233 were not followed;
 - b. may require the Company to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

3. In the event that the findings of the Acoustic Audit Report demonstrate that the Facility is not in compliance with the sound level limits set out in Ministry Publication NPC-300, the Company shall prepare and submit an updated Acoustic Assessment Report to the District Manager and the Director not later than six (6) months after the submission of the Acoustic Audit Report, that documents all sources of noise emissions and the most effective feasible Noise Control Measures that could be installed at the Facility.

SCHEDULE "A"

Table 1 - General Emission Sources

Source ID	Description	Exhaust Volumetric Flow Rate (cubic metre per second)	Stack Exit Diameter (metre)	Stack Height Above Grade (metre)	Stack Height Above Roof (metre)
AST2_STCK01	Boiler 1	57.13	2.29	15	NA
AST2_STCK02	Boiler 2	57.13	2.29	15	NA
AST2FLR1	Hot Flare	62.55 (equivalent flow rate)	1.07	91	NA
AST2FLR2	Cold Flare	5.33 (equivalent flow rate)	0.36	91	NA
AST2FLR3	Ground Flare	38.93 (equivalent flow rate)	6.14	19	NA
LDAR_AST2_RC	Reaction/Catalyst Area	NA/FE	NA/FE	NA/FE	NA/FE
LDAR_AST2_DP	Distillation/Purification Area	NA/FE	NA/FE	NA/FE	NA/FE
LDAR_AST2_FSR	Finishing Stripper/Rail Areas	NA/FE	NA/FE	NA/FE	NA/FE
LDAR_AST2_Ut	Utilities Area	NA/FE	NA/FE	NA/FE	NA/FE
LDAR_AST2_FI_VLCU	Flare/VLCU Area	NA/FE	NA/FE	NA/FE	NA/FE
LDAR_AST2_FinEx	Finishing Extruder Area	NA/FE	NA/FE	NA/FE	NA/FE
CTWR01	Cooling Tower Cell 1	715.86	10.00	16	NA
CTWR02	Cooling Tower Cell 2	715.86	10.00	16	NA
CTWR03	Cooling Tower Cell 3	715.86	10.00	16	NA
CTWR04	Cooling Tower Cell 4	715.86	10.00	16	NA

VLCU	Vapour Liquid Combustion Unit	87.54	1.98	25	NA
PM1	PF Bag Filter (100-DC-001)	0.004	0.1	31	NA
PM2	Blender #1 and #2 Dust Collector	9.2	0.71	10	NA
PM3	Blender #3 and #4 Dust Collectors	9.2	0.71	10	NA
PM4	Blender/Rework Bin Dust Collectors (300-DC-008C)	9.2	0.71	10	NA
PM5	Hopper Car Loading Bin #2 Dust Collector	2.12	0.51	21	NA
PM6	Scalperator #1 Dust Collector	2.12	0.51	21	NA
PM7	Scalperator #2 Dust Collector	3.32	0.46	21	NA

Table 1 - General Emission Sources (continued)

Source ID	Description	Exhaust Volumetric Flow Rate (cubic metre per second)	Stack Exit Diameter (metre)	Stack Height Above Grade (metre)	Stack Height Above Roof (metre)
PM8	Hopper Car Loading System #1 Dust Collector	3.32	0.46	21	NA
PM9	Hopper Car Loading System #2 Dust Collector	1.8	0.35	21	NA
PM10	Masterbatch/Carrier Resin Unloading System Dust Collector	1.8	0.35	21	NA
PM11	Masterbatch/Carrier Resin Bins Dust Collector	0.76	0.25	13	NA
PM12	Rework Unloading System Dust Collectors	1.17	0.25	34	NA
PM13	Side Feeder Hopper Dust Collector	0.44	0.15	9	NA
PM14	Extruder Building Housekeeping Dust Collector	0.51	0.20	13	NA
PM15	Stripper Product Hold Up Bin Dust Collector	0.41	0.15	7	NA
PM16	Rail Barn Housekeeping Dust Collector	0.35	0.15	26	NA
PM17	Dry Additive Bulk Bag Dump Station #1 Dust Collector	0.35	0.15	26	NA
PM18	Dry Additive Bulk Bag Dump Station #2 Dust Collector	0.35	0.15	26	NA
PM19	Dry Additive Bulk Bag Dump Station #3 Dust Collector	0.35	0.15	31	NA
PM20	Additive Bin Dust Collector (300-DC-086)	0.009	0.08	24	NA
PM21	Additive Bin Dust Collector (300-DC-087)	0.009	0.08	24	NA
PM22	Additive Bin Dust Collector (300-DC-088)	0.009	0.08	24	NA
PM23	Additive Bin Dust Collector (300-DC-089)	0.009	0.08	24	NA
PM24	Additive Bin Dust Collector (300-DC-090)	0.009	0.08	24	NA
PM25	Additive Bin Dust Collector (300-DC-091)	0.009	0.08	24	NA

Notes for Table 1 of Schedule "A" :

a. "NA" means not applicable;

b. "FE" means fugitive emissions;

c. Boilers 1 and 2 are natural gas fired steam boiler, each with a maximum heat input of 450.60 million kilojoules per hour;

d. The vapour liquid combustion unit is a direct natural gas-fired thermal oxidizer, with a maximum heat release of 84.4 million kilojoules per hour, serving the following equipment and processes:

- PCW Tank (300-TK-001), Reject Pellet Containers (300-TK-004A/B/S), Extruder Seal Area(300-EXP-001), Pelletizer Dewaterer (300-SR-001), Reslurry Tank ((300-V-009), Stripper Seal Leg Vent (300-V-010), Stripper Decanter (300-V-012), Stripper Condensate Drum #2 (300-V-015), SM Storage Tank (500-TK-001), FC Storage Tank (500-TK-002), SX Storage Tank (500-TK-003), FC Purge Tank (500-TK-004), Potentially Contaminated Water Tank (500-TK-007), Process Waste Water Tank (500-TK-008), Railcar loading area (RAILCAR).

Table 2 - Combustion Emission Sources

Equipment Identification Number	Equipment Description	Size Rating (kilowatt)	Fuel Type
AFE-4	One (1) Firewater Pump	450	diesel
AFE-5	One (1) Emergency Electricity Generator (1301-GEN)	1825	diesel
AFE-7	One (1) Emergency Electricity Generator (5201-GEN)	3500	diesel
AFE-6	Standby Power Generator - MPB/CMF	500	natural gas
AFE-8	One (1) Firewater Pump	93.2	diesel

Table 3 - General Emission Sources

Equipment Identification Number	Equipment Description
PW-1	MPB Maintenance Shop Parts Washer Exhaust System
EF-6	CMF Maintenance Welding Station Exhaust System
LAB1	MPB Fume Hood Exhaust System
LAB2	MPB Moisture Teller and Dust Collector Exhaust System

SCHEDULE "B"

PARAMETER: Temperature

LOCATION:

The sample point for the continuous temperature monitoring and recording system shall be installed at a location where the measurements are representative of the minimum temperature of the undiluted 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 5 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.

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

1. Condition No. 1 is included on the Approval to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the EPA, the regulations and this Approval.
2. Condition No. 2 is included to require the Company to retain records and provide information to the Ministry so that the environmental impact and subsequent compliance with the Act, the regulations and this Approval can be verified.
3. Condition No. 3 is included to require the Company to notify staff of the Ministry so as to assist the Ministry with the review of the site's compliance.
4. Condition No. 4 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Thermal Oxidizer.

5. Condition No. 5 is included to gather accurate information so that the environmental impact and subsequent compliance with this Approval can be verified.
6. Condition No. 6 is included to provide minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility/Equipment.
7. Condition No. 7 is included to require the Company to gather accurate information and submit an Acoustic Audit Report in accordance with procedures set in the Ministry's noise guidelines, so that the environmental impact and subsequent compliance with this Approval can be verified.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 5076-B9YMLT issued on May 28, 2019.

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**

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

DATED AT TORONTO this 18th day of February,
2021

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

AH/
c: District Manager, MECP Sarnia District Office
Jill Ward, NOVA Chemicals Corporation