



## Report:

Imperial Oil, Nanticoke Refinery  
Acid Gas Minimization Plan Under the Requirements of  
Ontario Regulation 530/18 (RY2020 Update)

Date: June 23, 2021

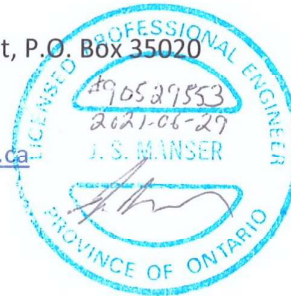


# Report:

## Imperial Oil, Nanticoke Refinery Acid Gas Minimization Plan Under the Requirements of Ontario Regulation 530/18 (RY2020 Update)

Submitted to: Imperial Oil  
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### Revision History

Version	Date	Summary Changes/Purpose of Revision
1	June 23, 2021	None

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## EXECUTIVE SUMMARY

This Acid Gas Combustion Minimization Plan was prepared to satisfy the requirements of Section 9(1) of Ontario Regulation 530/18 “Air Pollution – Discharge of Sulphur Dioxide from Petroleum Facilities” (O. Reg. 530/18). The North American Industry Classification System (NAICS) Codes that apply to this Facility include 324110 (Petroleum Refineries). Therefore, Imperial Oil Limited (Imperial) is required to comply with O. Reg. 530/18.

The plan required under Section 9(1) must be dated, signed and sealed by a licensed engineering practitioner and must set out the practitioner’s name and license number. The plan shall identify the:

- acid gas combustion equipment and upstream processes which may vent into the equipment;
- measures taken to minimize the combustion of acid gas;
- measures intended to be implemented in the future to minimize acid gas combustion;
- operating condition(s) during which the above measure(s) would minimize flaring or otherwise combustion of acid gas;
- methodology to be followed when performing the analysis of the primary cause of the discharge from the acid gas combustion equipment;
- methodology to be followed for the purpose of identifying the measures that are available to prevent or reduce the risk of recurrence of acid gas combustion;
- identification of the measures that are available to prevent or reduce the risk of a similar discharge happening, and
- information with respect to each time sulphur dioxide was discharged from acid gas combustion equipment at the facility as a result of a sulphur recovery unit failing to operate in a normal manner.

This Acid Gas Combustion Minimization Plan will be updated, on or before July 1<sup>st</sup>, of each year with information from the previous calendar year and a summary of this plan will be posted on the Facility’s website for a period of five years. This update reflects operations during calendar year 2020.

ORTECH Consulting Inc. (ORTECH) was retained by Imperial to prepare an update of the Acid Gas Combustion Minimization Plan under the requirements of O. Reg. 530/18 for their Nanticoke Operations.

Imperial Oil's Nanticoke refinery operations has the capacity to process up to 20,000 cubic meters per day of crude oil to produce propane and propylene, butane, gasoline, furnace fuel, diesel oil, aviation fuel, heavy fuel oil, and asphalt. The refinery is located on more than 600 hectares of land in the Municipality of Haldimand County. The site straddles Concession Road 2 about two kilometres east of Regional Road 55. The process units and storage tanks are located on the north side of Concession Road 2, while the refinery's wastewater treatment plant and on-site waste management area (“landfarm”) are located south of Concession Road 2.

Acid gas combustion equipment covered under this Plan includes the:

- North flare, and
- South flare.

Imperial has implemented several measures at the Facility to minimize the frequency, duration and magnitude of flaring or otherwise combusting acid gas as listed in Table 1.

**Table 1: Implemented Measures to Minimize Acid Gas Combustion**

Measure Taken	Associated Operating Condition	Date of Implementation
Modified start up and shut down procedures on SRU, ARU and SWS to minimize acid gas flaring. If acid gas flow rate goes below minimum required temperature, procedure is to add Nitrogen into system to prevent reaction furnace trip and in turn acid gas flaring.	During turn down and start up	September 2019
Installed permanent Nitrogen connection to eliminate acid gas to flare upstream of SRU. (Refer to Table 4 for details)	During turn down and start up	April 2020
<b>Install deviation alert in “Abnormal Event Detection-Real Time Alert” to identify if air blow is not responding to output</b>	<b>During normal operations</b>	<b>December 31<sup>st</sup>, 2020</b>
<b>Install alarm if atmospheric vent is open</b>	<b>During normal operations</b>	<b>December 31<sup>st</sup>, 2020</b>
<b>Implemented mitigation for snow ingress to damper inlet veins on the blower</b>	<b>During normal operations</b>	<b>February 16, 2021</b>
<b>Updated Technical Standards and Safety Authority testing Procedural updates</b>	<b>During TSSA testing,</b>	<b>April 15, 2021</b>

Imperial intends to implement several measures at the Facility to minimize the frequency, duration and magnitude of flaring or otherwise combusting acid gas as listed in Table 2.

**Table 2: Measures to be Implemented to Minimize Acid Gas Combustion**

Measure to be Taken	Associated Operating Condition	Date of Expected Implementation
<b>Swap out power supply and check electrical connection for air flow solenoid at next shutdown (cannot be done online)</b>	<b>During unit shut down</b>	<b>Next planned shut down</b>
<b>Identify other solenoids that could result in SRU shutdown and recommended testing and preventative maintenance activities.</b>	<b>Dependent on assessment results</b>	<b>Next planned shut down</b>
<b>Assess increasing reaction furnace trip time &gt;20 mins</b>	<b>During an unplanned shutdown of the incinerator</b>	<b>December 31<sup>st</sup>, 2021</b>
<b>Natural gas co-firing testing at reaction furnace.</b>	<b>During low flow rate conditions</b>	<b>December 31<sup>st</sup>, 2021</b>