March 31, 2024

As per Ontario Regulation 652/21, Section 15, the owner, and the operator of a facility shall ensure that the required information will be updated in an Implementation Summary Table, no later than March 31st of each year.

The 2023 Implementation Summary Table is included below, which details the provisions of the Regulation that apply to the facility, along with the specific requirements for each applicable provision.

Facility	Regulation Section	Requirements - date when provision first applied, and - date when compliance was achieved, if applicable.	Implementation Status
Smelter/ CCNR	Section 2(2) – Applicability to Vale Smelter, and Section 2(3) – Applicability to Vale Nickel Refinery	Smelter – July 1, 2023 CCNR – July 1, 2023 CCNR Section 4 – Primary off-gas capture requirement comes into effect July 1st, 2026. – Installation of Wet Gas SO_2 Scrubber scheduled for commissioning in Q1 2026 for TBRC off-gas	Fully Implemented – at the Smelter Implemented at the CCNR, with exception for Section 4
Smelter	Section 3(1) – Primary off-gas collection system	All pyrometallurgical vessels must have primary off-gas collection systems: – Flash furnace primary off-gas capture installed in 1994. – Fluid Bed roaster off-gas capture implemented in 2006. – Pierce-Smith converters off-gas capture installed in 2018, with the completion of the Clean AER project.	Fully Implemented
Smelter	Section 3(2)(c) – Secondary off-gas collection system	Where applicable, pyrometallurgical vessels must have secondary off-gas collection systems. – Converters secondary off-gas capture installed in 2018, with the completion of Clean AER project. – Section 3(4) – Secondary off-gas collection system does not apply to slag cleaner. – Vale investigating implementation of Slag cleaner secondary hooding; Slag Cleaner retractable secondary hooding scheduled for installation during PMP 2024 (April-May 2024).	Fully Implemented
CCNR	Section 3(2)(b) and, Section 3(3)	Where applicable, pyrometallurgical vessels must have secondary off-gas collection systems. – Section 3(2)(b) – Secondary off-gas collection requirement does not apply to the existing CCNR top-blown rotary converters (TBRCs), which were originally installed between 1970-1972. This clause applies only to new vessels installed on or after January 2021. – Section 3(3) – Secondary off-gas collection system does not apply to replacements in-kind of the TBRCs.	Fully Implemented
Smelter/ CCNR	Section 4(1)	Discharge of sulphur dioxide must be captured by an off-gas collection system and sent to a baghouse that uses lime injection or to a wet scrubber. – Smelter – Secondary off-gas collection system received off-gas from converters and fugitive emissions from Flash Furnace skimming/tapping activities. Secondary baghouse with Lime injection installed with Clean AER project and completed in 2018. – CCNR – The construction of a Wet Gas SO_2 Scrubber is currently underway at the facility to capture and treat SO_2 emissions from the TBRCs. – Wet Gas SO_2 Scrubber at CCNR scheduled for commissioning in Q1 2026.	Fully Implemented – at the Smelter Not implemented – at the CCNR
Smelter	Section 4(2)(a)	The primary off-gas from all pyrometallurgical vessels must be collected, cleaned, and sent to Acid plant. – Flash furnace primary off-gas capture in 1994. – Fluid Bed roaster off-gas capture in 2006. – Pierce-Smith converter off-gas capture in 2018 with completion of Clean AER project.	Fully Implemented
Smelter	Section 4(3)	If maintenance on acid plant or system, off-gas discharged to air. New stacks for discharge part of surface facility upgrade in 2019-2020. Superstack and Copper Stack were decommissioned. – Flash Furnace, Converters, and Fluid Bed Roasters discharge to 137m stacks. Acid plant discharges to 110m stack.	Fully Implemented

Facility	Regulation Section	Requirements - date when provision first applied, and - date when compliance was achieved, if applicable.	Implementation Status
Smelter	Section 4(4)	Recommendations from a Professional engineer for operation of Acid Plant. The report was submitted to the MECP in 2023 under "Record of SO_2 sources report". – Regulation applied to Vale effective July 1, 2023. – Implemented - Submission of report to MECP in September 2023.	Fully Implemented
Smelter/ CCNR	Section 8(1)(2)	Record of equipment at facility that discharges sulphur dioxide with date of installation and what management method is used. The report was submitted to the MECP in 2023 under "Record of SO_2 sources report". – Regulation applied to Vale effective July 1, 2023. – Implemented - Submission of report to MECP in September 2023.	Fully Implemented
Smelter	Section 8(3)	Professional engineer recommendations for proper operation and maintenance procedures of Vale's double contact acid plant. The report was submitted to the MECP in 2023 under "Record of SO_2 sources report". – Regulation applied to Vale effective July 1, 2023. – Implemented - Submission of report to MECP in September 2023.	Fully Implemented
Smelter/ CCNR	Section 10	Applicable if changes to Managed sources, requires communication and documentation to Ministry of Environment, Conservation and Parks (MECP). No managed changes in 2023. The report was submitted to the MECP in 2023 under "Record of SO_2 sources report". There have been no changes. – Regulation applied to Vale effective July 1, 2023. – Implemented - Submission of report to MECP in September 2023.	Fully Implemented
Smelter/ CCNR	Section 11	Applicable section if sulphur dioxide measured readings are 120 ppb or greater on an annual basis. Notification, root cause analysis, corrective and preventative actions are required. – Vale SO_2 monitoring system (Emission reduction program) updated to track events. – No reported values 120 ppb or greater for Vale operations from July1, 2023 to December 31, 2023.	Fully Implemented
Smelter/ CCNR	Section 12	Capture Efficiency Assessment planning report required for Smelter and CCNR. – Due July 1, 2024, Capture Efficiency Assessment required for Smelter Converter aisle and NRC Converter aisle.	Not implemented
Smelter/ CCNR	Section 13	Effectiveness report on measures to reduce concentration of sulphur dioxide at points of impingement that were implemented at the facility during the period starting January 1, 2016, to July 1, 2023. – Due July 1, 2024, Effectiveness report on measures taken from January 1, 2016, to July 1, 2023.	Not implemented
Smelter/ CCNR	Section 14	Any new implementation at facility, primary, secondary off-gas collection system fitted to a pyrometallurgical vessel or a baghouse or wet scrubber that treats discharges of sulphur dioxide from a pyrometallurgical vessel will be reported within one year to MECP. – Annual updating and review of implementation table will capture requirement.	Fully Implemented
Smelter/ CCNR	Section 15(1)	No later than March 31 of each year, implementation summary table must be updated. State when compliance was achieved. – Implemented as of March 31, 2024.	Fully Implemented
Smelter/ CCNR	Section 15(2)	Owner of facility ensures that implementation summary table is available to the public during regular business hours without charge, posting it on facility's website and making it available at the facility during regular business hours. – Implemented as of March 31, 2024.	Fully Implemented