

Proposed Amended Rule 1117

Emissions From Container Glass Melting and Sodium Silicate Furnaces

Public Workshop
South Coast AQMD
March 19, 2020

Background

- 2016 AQMP Resolution for Control Measure CMB-05
 - Achieve five tons per day NO_x emission reductions in RECLAIM by 2025
 - Transition NO_x RECLAIM to a command-and-control regulatory structure and require Best Available Retrofit Control Technology (BARCT) as soon as practicable
- AB 617
 - Implementation of BARCT – December 31, 2023
- Amendments to Rule 1117 are needed to establish BARCT requirements for equipment at container glass and sodium silicate producing facilities

Regulatory History of Rule 1117

- Adopted February 1982, last amended January 1984
- Applicability specific to glass melting furnaces (e.g., container glass, flat glass)
- Addressed NOx emissions
 - NOx emission limit: 4 lbs of NOx/ton of glass pulled
- All facilities subject to Rule 1117 were subsumed into RECLAIM

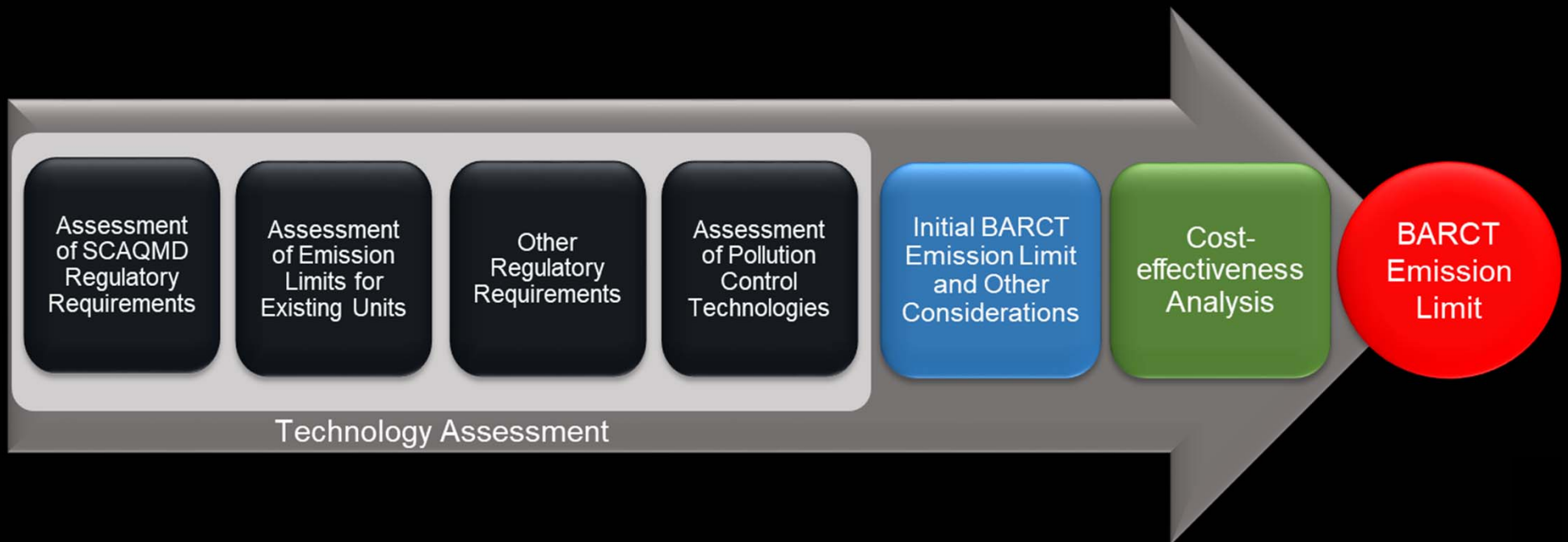
Proposed Amended Rule 1117 (PAR 1117)

Applicability

- Expand the applicability to include
 - Container glass and sodium silicate production facilities
 - Address NOx and SOx emissions
- One container glass production facility
 - Two container glass melting furnaces
 - Auxiliary combustion equipment, consisting of molten glass conveyance system and annealing furnaces
- One sodium silicate production facility
 - One sodium silicate furnace

BARCT Assessment

- BARCT analysis conducted for each equipment category



Proposed Rule Language

Proposed Amended Rule 1117

Title, Purpose, and Applicability

- The applicability will be expanded to include:
 - Auxiliary equipment at container glass melting facilities
 - Sodium silicate manufacturing facilities
 - SO_x emissions

PAR 1117 Title

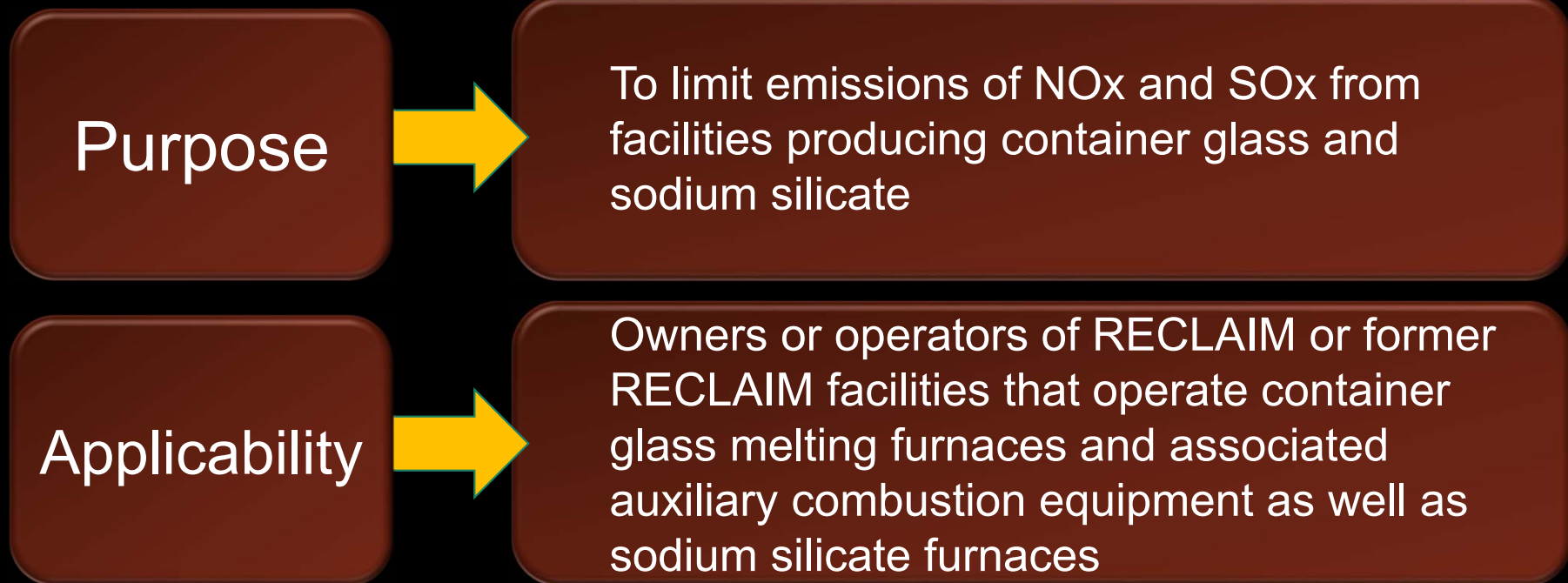
Previous Rule
1117 Title

Emissions of
Oxides of Nitrogen
from Glass Melting
Furnaces

Title for PAR
1117

Emissions From
Container Glass
Melting and
Sodium Silicate
Furnaces

Purpose (a) and Applicability (b)



Definitions (c)

- Added and revised definitions to:
 - Reflect facilities are in RECLAIM and RECLAIM transition
 - Update terms to reflect current industry terms
 - Provide clarity for proposed amendments
- New and updated definitions for:

- AUXILIARY COMBUSTION EQUIPMENT
- CONTAINER GLASS MELTING FURNACE
- CULLET
- DAY
- FORMER RECLAIM FACILITY
- FURNACE
- IDLING
- NO_x EMISSIONS
- PRODUCTION CAPACITY
- PULL OR PULLED
- RECLAIM FACILITY
- SHUTDOWN
- SODIUM SILICATE FURNACE
- SO_x EMISSIONS
- STARTUP

Requirements (d)

Highlights

- Establish NO_x and SO_x emission limits for container glass melting and sodium silicate furnaces
- Operation during periods of idling, startup, and shutdown
- Establish NO_x emission requirements for auxiliary combustion equipment for container glass melting facilities

Pollution Control Systems Installed in South Coast AQMD

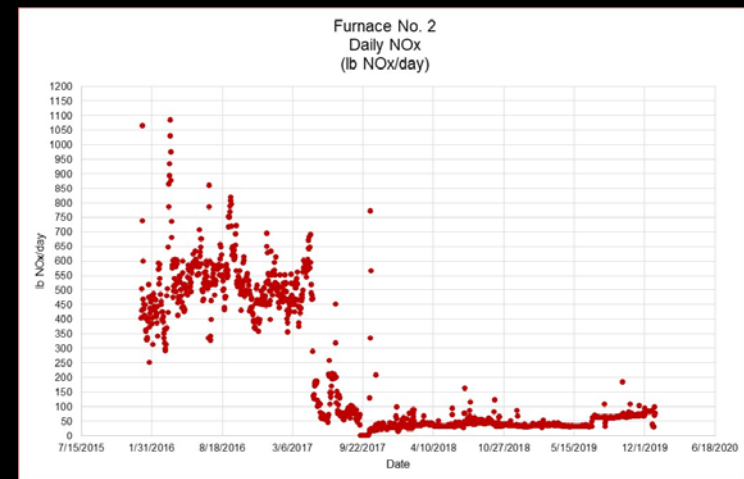
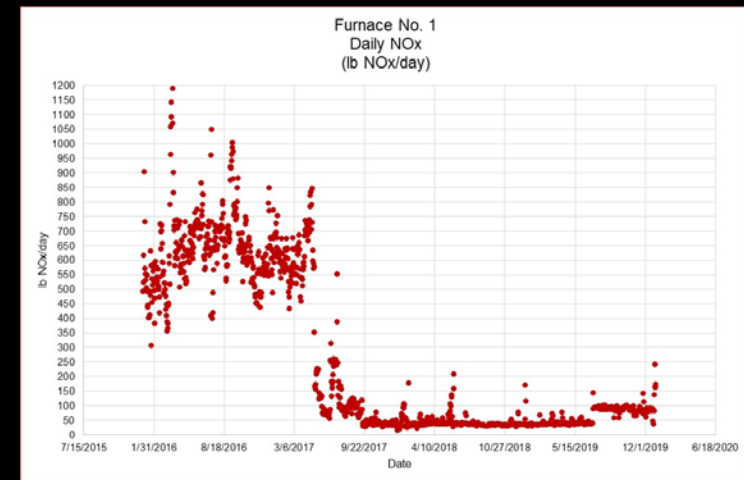
- Two container glass melting furnaces and one sodium silicate furnace equipped with ceramic catalytic filter (CCF) pollution controls
 - Utilizes technology that has the capability of reducing NO_x, SO_x, and PM concurrently
- Equipment installed in 2017 in response to 2015 NO_x RECLAIM amendments (2015 shave)
- Staff's evaluation shows NO_x reduction >85%

NO_x Emissions after CCF Installation

Container Glass

- NO_x Reduction*
 - Furnace 1 – from 650 lbs/day to 50 lbs/day ≈ 92.3% reduction
 - Furnace 2 – from 500 lbs/day to 50 lbs/day ≈ 90.0% reduction
- Some spikes in daily emission levels
- Step change in operation – July 2019
- Factors in NO_x reductions
 - Tri-mer system
 - Oxy-fueled burners

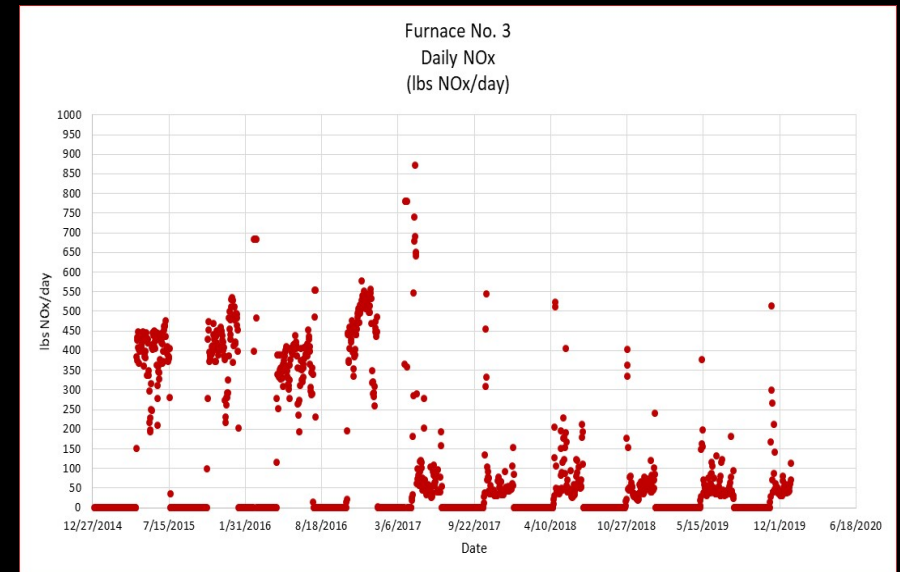
* NO_x emissions based on reported RECLAIM data (unaudited)



NO_x Emissions after CCF Installation

Sodium Silicate

- NO_x Reduction*
 - Furnace – from 425 lbs/day to 60 lbs/day ≈ 85.9% reduction
- Some spikes in daily emission levels
- Batch process with limited production runs leading to more frequent startups and shutdowns



* NO_x emissions based on reported RECLAIM data (unaudited)

Proposed Emission Limits

- NO_x limits based on levels achieved and sustained in actual operation
- SO_x limits based on permit limits or fuel use restriction
- Differences in furnace configuration and operation require separate emission limits for container glass and sodium silicate
- To address transient operational spikes, staff proposes a 30-day rolling average

Emission Limits (d)(1) and (d)(2)

BARCT assessment evaluated emission limits and performance for existing units, requirements in other jurisdictions, and pollution control technology

Container Glass

- NOx: 0.25 lb/ton glass pulled (30 day rolling average)
- SOx: 1.1 lbs/ton glass pulled

Sodium Silicate

- NOx: 0.50 lb/ton glass pulled (30 day rolling average)
- SOx: 1.1 lbs/ton glass pulled or operate using natural gas

Idling, Startup, and Shutdown (d)(1) and (d)(2)

- The emission limits in paragraphs (d)(1) and (d)(2) would not apply during periods of idling, startup, or shutdown
 - Idling: defined as the operation of the furnace at less than 25 percent of the permitted production capacity and where the furnace is not undergoing startup or shutdown
 - Startup: defined as the period of time when a furnace is heated to operating temperature from furnace temperatures below 200°F
 - Shutdown: defined as the period of time when a furnace is cooled from operating temperature to a furnace temperature below 200°F

Proposed Time Limits for Idling, Startup, and Shutdown

- Startups and shutdowns for these types of furnaces have long durations to ensure refractory integrity and product quality
- Time required to reach pollution control operating temperature

Idling

- 240 hours consecutive per event
- 960 hours cumulative per rolling 365-day period

Startup

- 720 hours per event

Shutdown

- 240 hours per event

Auxiliary Equipment Emission Limits

- Defined as combustion equipment associated with the conveyance system or annealing equipment used in the container glass production process
- Proposed emission limit – 30 ppmvd @ 3% O₂, dry
- Demonstrate compliance 15 years after date of amendment
 - Source test
 - Manufacturer certification

Compliance Determination (e)(1)

- CEMS Monitoring Requirements



Transition

Current RECLAIM Facilities

- Rules 2011 & 2012

Former RECLAIM Facilities

- Rules 218 & 218.1
- Proposed Rules 218.2 & 218.3
Scheduled for Board 4th quarter 2020

Recordkeeping

- Maintain daily records of:
 - Total hours of operation
 - The quantity of product pulled from each furnace
 - Pollutant rates in units of pound of pollutant per ton of product pulled, averaged over rolling 30-day average
- Maintain records for five years and make available upon request
- Continue to maintain records required by RECLAIM (Regulation XX) until such time that facility exits RECLAIM

Exemptions

- Reduced applicability threshold to exempt only small operators
- Removed glass tableware and flat glass exemptions
 - Incorporated in container glass furnace definition for exclusion
- Revised fiberglass exemption for clarity
- Removed idling exemption
 - Provisions for these periods contained under subdivision (d) - Requirements

Impact Assessment

Proposed Amended Rule 1117

Emission Reductions

Source	2016 Emissions (tons per day)	2019 Emissions (tons per day)	Emission Reductions (tons per day)
Container Glass Furnaces	0.583	0.0565	0.523
Sodium Silicate Furnace	0.205	0.032	0.173
Auxiliary Combustion Equipment ^A	Average Yearly Emissions = 0.021		0.015
Total ^B	0.788	0.0885	0.700

^A Emissions from the auxiliary combustion equipment were not impacted by the addition of the CCF system. Expected emissions reductions expected at next equipment replacement.

^B Total emissions calculations do not account for emissions from auxiliary equipment.

Cost-Effectiveness

Source Category	Capital Costs (\$ million)	Annual Costs (\$ million)	Present Worth Value (\$ million)	Emissions Reductions (tpd)	Cost-Effectiveness (\$/ton of NOx Reduced)
Container Glass Manufacturing	5.57	0.62	15.2	0.527	3,200
Sodium Silicate Manufacturing	4.34	0.11	6.03	0.173	3,800
Auxiliary Equipment (Container Glass)	N/A	N/A	N/A	N/A	N/A
Total ^A				0.70	3,300

^A Cost-effectiveness calculation for auxiliary equipment was not considered since equipment is expected to be replaced at next furnace rebuild and not expected to incur any incremental cost associated with PAR 1117.

Socioeconomic Impact Assessment and CEQA Analysis

- Equipment required to comply with PAR 1117 is already installed and operating
- Auxiliary equipment will be installed during normal furnace rebuild schedule
- No additional costs and no significant adverse environmental impacts are expected

Questions



Next Steps



Comments Due

April 2, 2020

Set Public Hearing

May 1, 2020

Public Hearing

June 5, 2020

Contacts



Rodolfo Chacon
Air Quality Specialist
rchacon@aqmd.gov
909-396-2726

Kevin Orellana
Program Supervisor
korellana@aqmd.gov
909-396-3492

Mike Morris
Planning and Rules Manager
mmorris@aqmd.gov
909-396-3282