PR 1165
Emission Reductions for Municipal Solid Waste Incinerators

Working Group Meeting #1
November 16, 2023

Agenda

Background

Rule Development Process

Proposed Universe & Equipment

Next Steps

Background

Background

- U.S. EPA sets federal attainment standards for various criteria air pollutants
- Criteria air pollutants are six common air pollutants identified in the U.S. Clean Air Act
  - Includes ozone, PM10, and PM2.5
  - National Ambient Air Quality Standards ("NAAQS") define maximum level of each pollutant
- South Coast Air Basin (Basin) is in "extreme nonattainment" against several NAAQS

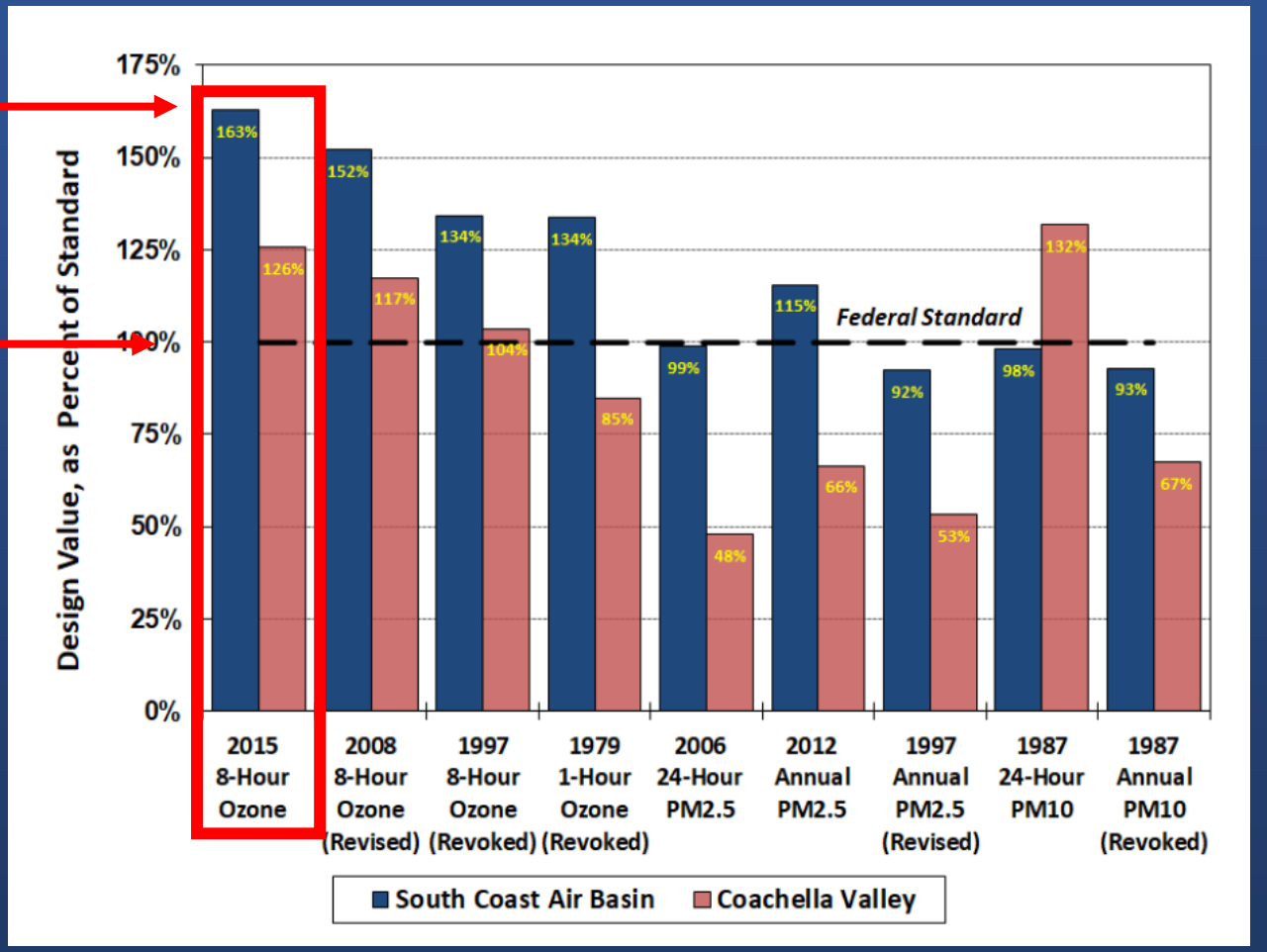
- South Coast AQMD's 2022 Air Quality Management Plan (AQMP) provides a roadmap to improve air quality.
- 2022 AQMP details emission reduction control measures to achieve attainment by 2038

Background (cont.)

These are the standards that our jurisdiction ***must*** meet:

- 2015 8-hour average federal standard for ozone
  - 0.070 ppm (70 ppb)
- Highest Basin 8-hour ozone for 2018-2020
  - 0.114 ppm (114 ppb)[1]

Figure 1. NAAQS Standards vs. Basin Ambient Levels



[1] http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16. Table 2-7. Page 2-24.

http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16. Figure 2-1. Page 2-11.

U.S. EPA "Good Neighbor Plan"

- Issued on March 15, 2023[1] as an implementation of the "good neighbor" provision of Clean Air Act Section 110[2](a)(2)(D)(i)(I)
- Requires each 23 states to each submit a State Implementation Plan (SIP)
  - SIP will ensure that pollution sources do not contribute significantly hinder NAAQS attainment in other states
- Good Neighbor Plan affects power plants (or Electricity Generating Units, "EGUs") and industrial facilities (or non-EGUs)

[1] U.S. EPA. Federal ''Good Neighbor Plan'' for the 2015 Ozone National Ambient Air Quality Standards. https://www.govinfo.gov/content/pkg/FR-2023-06-05/pdf/2023-05744.pdf.
[2] See U.S. Clean Air Act Section 110(a)(2)(D)(i)(I) (under U.S. Code §7410). https://www.govinfo.gov/content/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapIpartA-sec7410.htm.

U.S. EPA "Good Neighbor Plan" (cont.)

- Non-EGU category includes municipal solid waste (MSW) combustors or incinerators
- Table I.B-7 specifies the NOx limits[1] for MSW incinerators
  - NOx limits must be demonstrated in compliance by the beginning of the 2026 ozone season (typically May 1)

TABLE I.B–7—SUMMARY OF NO_X EMISSIONS LIMITS FOR COMBUSTORS AND INCINERATORS IN SOLID WASTE COMBUSTORS OR INCINERATORS

Combustor or incinerator, averaging period	NO_X emissions limit (ppmvd)
ppmvd on a 24-hour block averaging period	110
ppmvd on a 30-day rolling averaging period	105

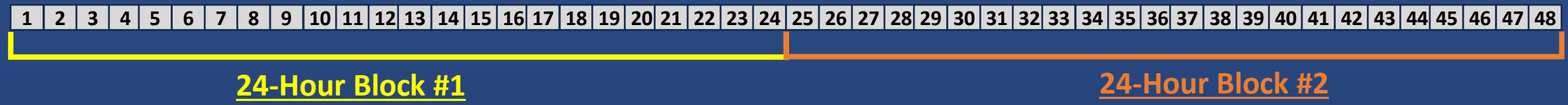
[1] NOx limits are corrected to 7% O2.
https://www.epa.gov/system/files/documents/2023-03/Final%20Non-EGU%20Sectors%20TSD.pdf.

Averaging Periods

Two limits are required of MSW incinerators

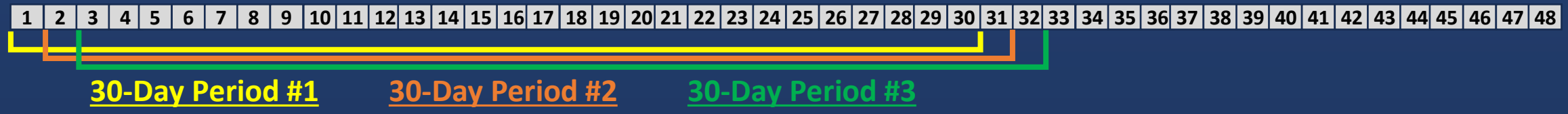
Limit #1: 24-Hour block average (110 ppmvd NOx @ 7% O2)

Uses Hours and is “Non-Overlapping”



Limit #2: 30-Day rolling average (105 ppmvd NOx @ 7% O2)

Uses Hours* and is “Overlapping”



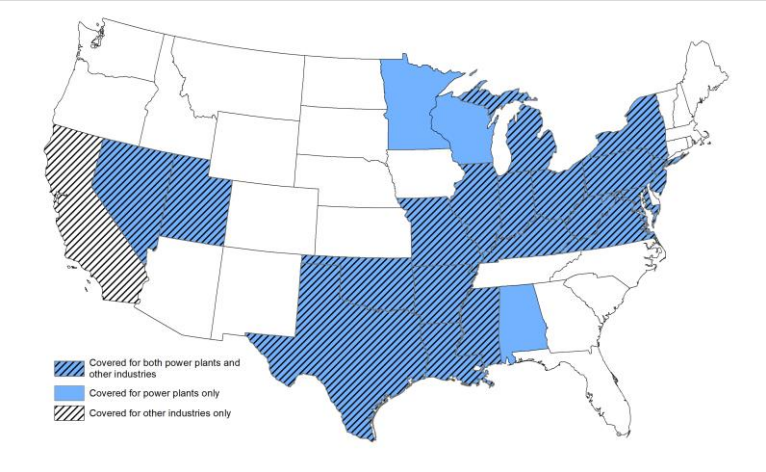
* Aggregated values are still hours. Only days are shown for simplicity. Each 30-day period will include 720 1-hour data points.

Need for PR 1165

PR 1165 will codify emission requirements and other operating considerations into a rule*

Compliance with U.S. EPA Good Neighbor Plan

- Establish implementation and permitting schedule for compliance
- Include requirements for meeting U.S. EPA limits of 110 and 105 ppmvd NOx @ 7% O2



Compliance with Basin NAAQS Attainment

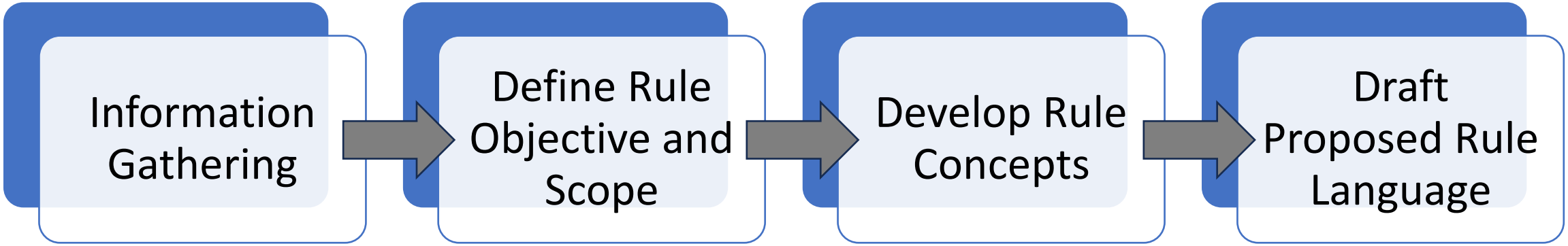
- Further reduce aggregate PM emissions
  - Included in draft plan for PM2.5, scheduled for release in 2024
- Further reduce aggregate NOx emissions beyond U.S. EPA Good Neighbor Plan
  - Included in 2022 AQMP Control Measure L-CMB-09

* Both rule and permit conditions will apply

Image source: U.S. EPA. *Good Neighbor Plan for 2015 Ozone NAAQS*. https://www.epa.gov/Cross-State-Air-Pollution/good-neighbor-plan-2015-ozone-naaqs.

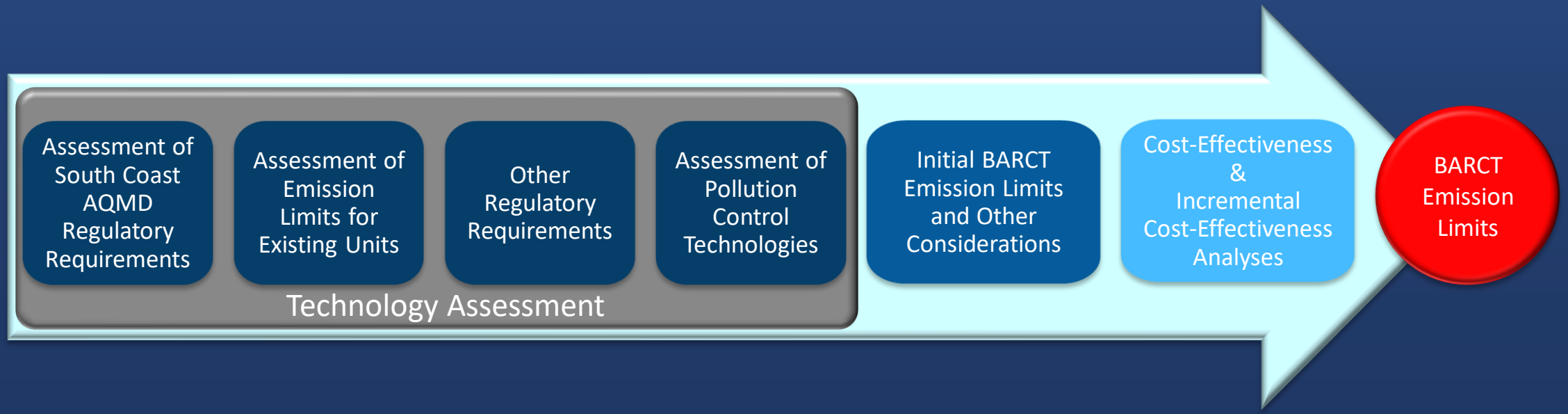
Rule Development Process

Rule Development Action Steps



BARCT Assessment Process

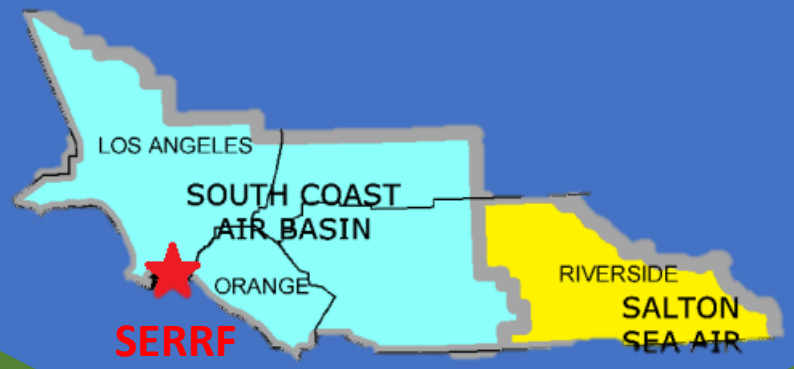
- Best Available Retrofit Control Technology (BARCT) Assessment is conducted for each class and category of equipment
- Begins with a Technology Assessment
  - Involves review of both current regulations and technology solutions
- Assessed data informs initial BARCT limits which undergo cost-effectiveness analyses
- BARCT analysis aims to achieve the greatest amount of emission reductions in a cost-effective manner



Proposed Universe & Equipment

Proposed Universe

- One MSW incinerator in Basin
  - City of Long Beach's Southeast Resource Recovery Facility (SERRF)
  - No other incinerators identified by Staff
- SERRF owned by City of Long Beach and operated by Covanta



- Only one other MSW facility in California, located in Stanislaus County
  - Also operated by Covanta, but is outside the South Coast Air Basin

Facility Background

The Long Beach Southeast Resource Recovery Facility (SERRF) began operation in July 1988

Built in response to population growth and closure of neighboring landfills

Utilizes mass-burn process to reduce volume of nearly 1,300 tons of municipal solid waste (MSW) per day

Generates up to 38 MW of electricity per day

Facility produces toxics and large amounts of criteria air pollutants

SERRF Equipment Process

SERRF Equipment Process – Tipping Hall & Refuse Storage

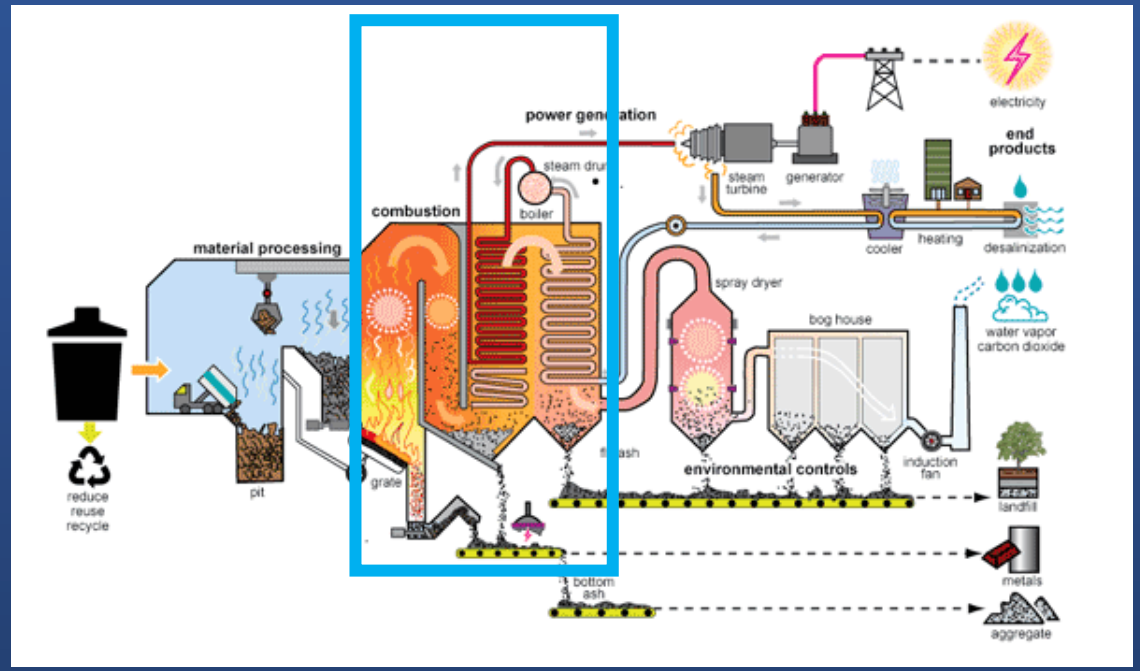
- MSW delivered by trucks, which are screened for radioactive material while being weighed
- Trucks discharge load in tipping hall and are inspected for unprocessable waste
- Waste pushed into refuse storage pit and lifted by grab cranes into furnaces

Pollutant	Pollution Control
- Odors - Dust (Particulate Matter)	- Negative air pressure - Carbon air filters when boilers are undergoing maintenance

Image Source: Snohomish County Public Works. *Comprehensive Solid and Hazardous Waste Management Plan – 2021*. https://snohomishcountywa.gov/DocumentCenter/View/83227/SnoCoCompSolidHazWastePlanCombinedDRAFT20210628.

SERRF Equipment Process – Boilers

- MSW loaded onto feed chutes which push waste into three boilers
- Heat generated from burning waste converts water in boilers into steam to produce power
- Ash from burned waste collected into a quench tank
- Equipment of highest concern for meeting NAAQS standards

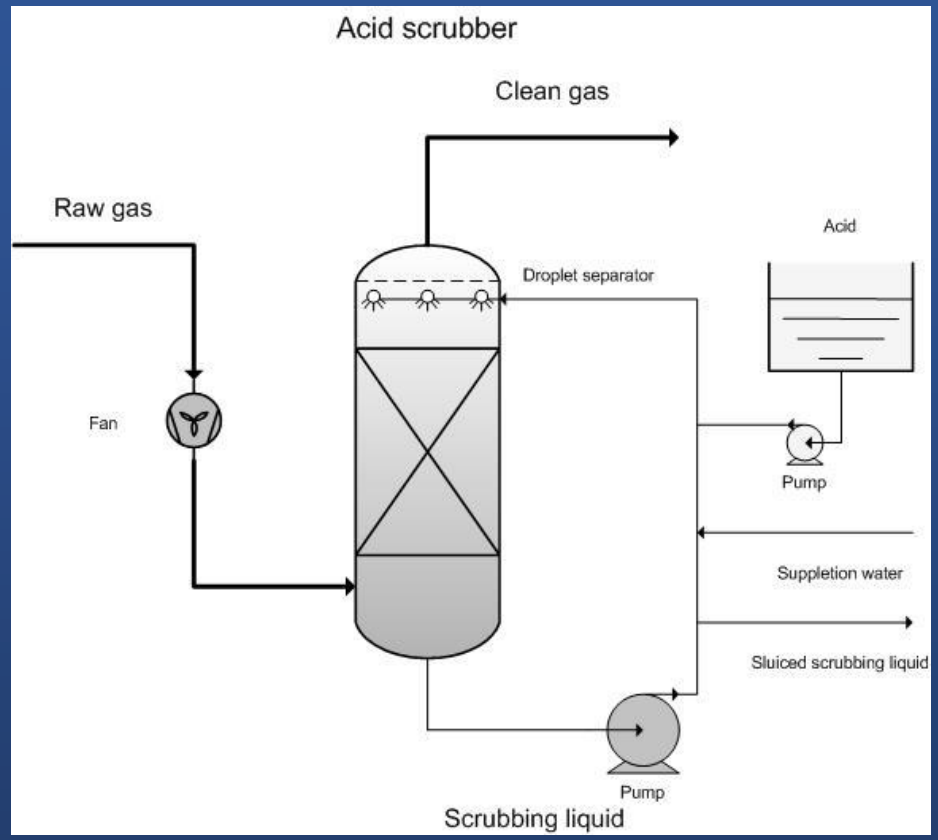


Pollutant	Pollution Control
- NOx - Particulate Matter in the form of bottom ash (PM2.5 and PM10)	- Patented Selective Non-Catalytic Reduction ammonia injection system - Quench tank

Image Source: U.S. Energy Information Administration. *Biomass explained: Waste-to-energy (Municipal Solid Waste)*. https://www.eia.gov/energyexplained/biomass/waste-to-energy-in-depth.php.

SERRF Equipment Process – Dry Scrubbers

- Exhaust gases from boilers flow through to into three dry scrubbers
- Utilizes injected lime slurry
- Removes 95% of acid gases
- Reacted lime mixture collected with bottom ash

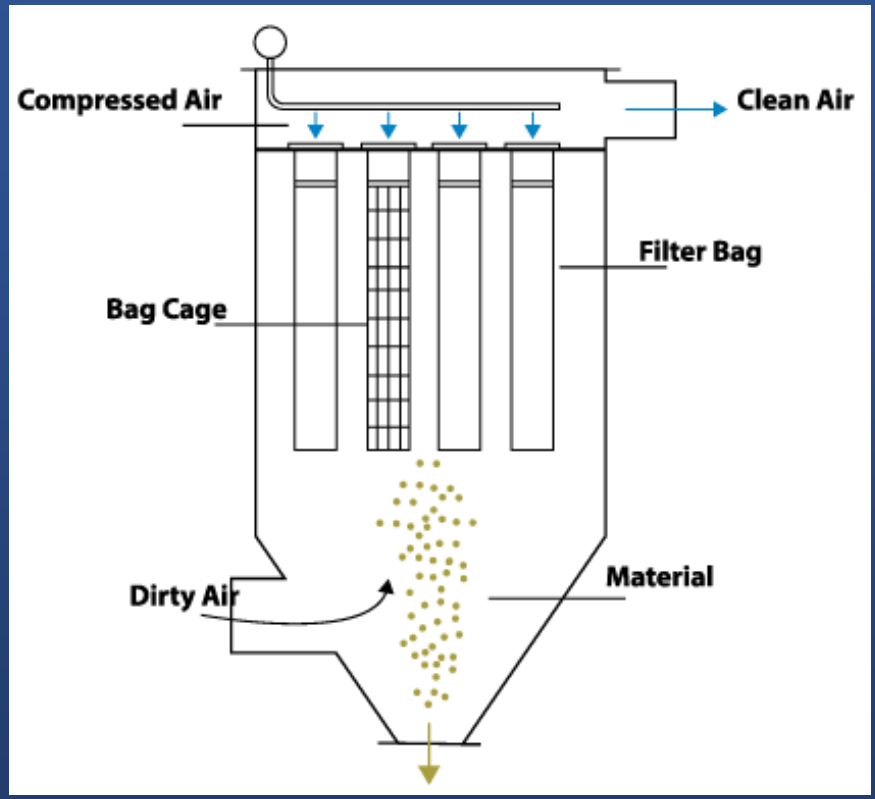


Pollutant	Pollution Control
- Acid gases (SOx, HCl)	- One dry scrubber utilizing injected lime, per boiler

Image Source: Emis. *Acid Scrubber*. https://emis.vito.be/en/bat/tools-overview/sheets/acid-scrubber.

SERRF Equipment Process – Baghouses

- Exhaust gases from dry scrubbers flow through into three baghouses
- Consists of porous fiberglass bags which trap particulates
- Removes 99.5% of particulate emissions in inlet stream
- Collected particulates collected into ash handling system



Pollutant	Pollution Control
- Particulate Matter in the form of fly ash (PM2.5 and PM10)	- One bag house per boiler

Image Source: IAC International. *What is a Baghouse?.* https://iac-intl.com/baghouse/.

SERRF Projected Compliance with U.S. EPA Good Neighbor Plan Limits – 24-Hour Block Average

24-hour block average values are projected to be in non-compliance (> 110 ppm) 2-4% of total operating hours

Table 1. Percentage of Operating Hours in NOx Emission Tiers

NOx (ppm @ 7% O2)	2022	2021	2020	2019	2018
< 60 ppm	24%	10%	3.2%	8.4%	16%
60-110 ppm	74%	89%	96%	88%	80%
110-150 ppm	**2.0%**	**1.0%**	1.3%	3.9%	3.9%
> 150 ppm	**0.0%**	**0.0%**	0.0%	0.0%	0.0%

SERRF Projected Compliance with U.S. EPA Good Neighbor Plan Limits – 30-day Rolling Average

30-day rolling average values are projected to be in non-compliance (> 105 ppm) 0-7% of total operating hours

Table 2. Percentage of Operating Hours in NOx Emission Tiers

NOx (ppm @ 7% O2)	2022	2021	2020	2019	2018
< 60 ppm	15%	7.3%	0.0%	1.6%	23%
60-105 ppm	85%	93%	100%	97%	70%
105-150 ppm	**0.1%**	**0.0%**	0.0%	1.4%	6.8%
> 150 ppm	**0.0%**	**0.0%**	0.0%	0.0%	0.0%

SERRF Projected Compliance with U.S. EPA Limits (cont.)

SERRF is expected to meet the U.S. EPA limits with minor modifications to operating settings

24-Hour Block Average Limit

- Projected non-compliance in 2022 was 2% of operating hours
- Only two of three boilers exceeded 110 ppmvd NOx @ 7% O2
- Of those two boilers, maximum NOx value was 121 ppmvd @ 7% O2

30-Day Rolling Average Limit

- Projected non-compliance in 2022 was 0.1% of operating hours
- Only one of three boilers exceeded 105 ppmvd NOx @ 7% O2
- For that one boiler, maximum NOx value was 105.16 ppmvd @ 7% O2

Summary Slide

Objective 1
U.S. EPA Good Neighbor Plan Compliance

- PR 1165 can incrementally reduce ppm emissions to achieve compliance with NOx limits by May 1, 2026
  - 24-hour block average: 110 ppmvd @ 7% O2
  - 30-day rolling average: 105 ppmvd @ 7% O2

Image Source: Arizona State University. *Arizona will fail clean-air standards if other states aren't 'good neighbors'*. https://cronkitenews.azpbs.org/2023/03/29/arizona-will-fail-clean-air-standards-if-other-states-arent-good-neighbors/.

Objective 2
BARCT Emission Reductions and Basin Attainment Progress

- PR 1165 will enable a full BARCT analysis of other emission control technologies
- PR 1165 may reduce aggregate NOx, PM, and toxic emissions from SERRF
- Lower emissions at SERRF will contribute to attainment in the Basin for both PM and Ozone

Image Source: South Coast AQMD. *2016 Air Quality Management Plan Appendix II*. https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-ii.pdf

Next Steps

Next Steps

Conduct BARCT Assessment

- Continue discussions with facilities and vendors
- Conduct technology assessment for NOx and co-pollutant control technology

Assess Initial Rule Concepts

- Multiple limits
  - Meet U.S. EPA limit by 2026
  - Meet BARCT limit by X year
- Compliance averaging periods
- Limitations for start-up/shutdown operations

Hold Additional Working Groups

- Open to the public
- Designed to provide forum for discussion, questions, and next steps

Public Process Timeline

- Public Workshop: March 2024 (tentative)
- Set Hearing: May 2024 (tentative)
- Public Hearing: June 2024 (tentative)

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