



# Proposed Amended Rule 1135

## Emissions of Oxides of Nitrogen from Electricity Generating Facilities

Public Workshop  
February 22, 2023

Join Zoom Webinar Meeting: <https://scaqmd.zoom.us/j/94648515982>

Webinar ID: 946 4851 5982

Teleconference Dial-In: 1-669-900-6833

# Agenda

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Background

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Preliminary Draft Rule Language

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Impact Assessments

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Next Steps

The image shows a large industrial facility, likely a refinery or chemical plant. On the left, a tall, cylindrical vertical tank is visible, surrounded by a complex network of metal scaffolding and walkways. The structure is made of dark metal, possibly steel. In the background, other industrial equipment, including more tanks and piping, is visible under a clear blue sky. A semi-transparent black rectangular box is overlaid on the right side of the image, containing the word "Background" in white text.

**Background**

# Rule 1135 Regulatory Background

Rule 1135 was adopted in 1989 and addresses NOx emissions from electricity generating facilities

Most recently, amendments on January 7, 2022 revised requirements for Santa Catalina Island diesel engines

- Limits annual NOx emissions by a certain date from electricity generating facility to:

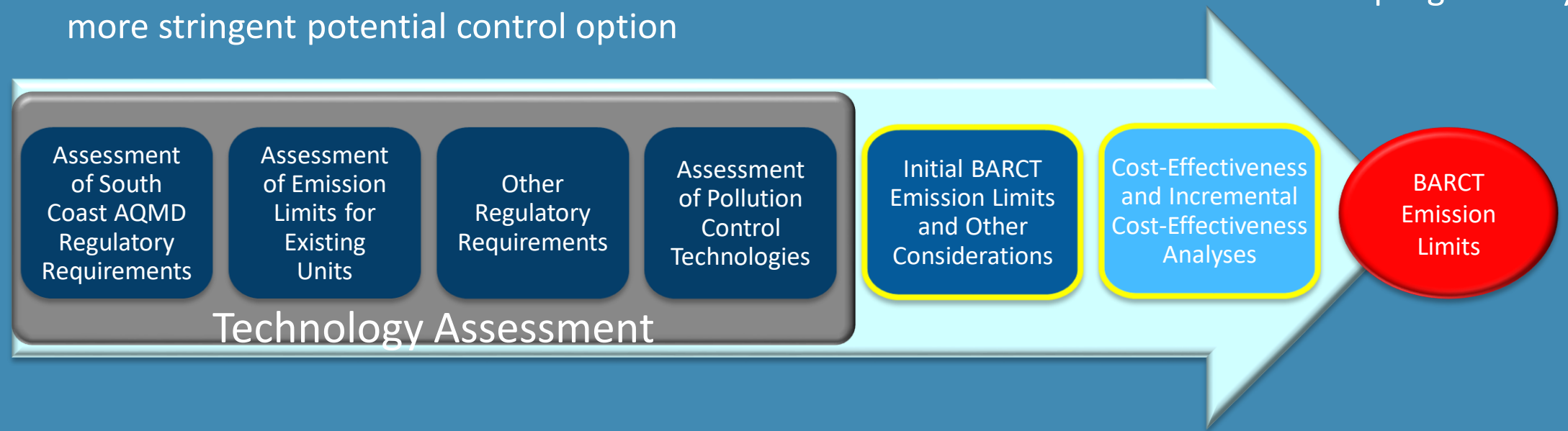
2024	2025	2026
50 tons per year	45 tons per year	13 tons per year

- Adopted resolution to conduct a revised Best Available Retrofit Control Technology (BARCT) assessment for electric generating units on Santa Catalina Island



# BARCT Assessment

- South Coast AQMD conducted a BARCT assessment to determine if near-zero-emission (NZE) and zero-emission (ZE) technologies can replace all or some of the existing diesel engines on Santa Catalina Island
- Health and Safety Code (H&SC), Section 40406 defines BARCT as “...an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source.”
- BARCT levels must adhere to H&SC, Section 40920.6
  - Cost-effectiveness and incremental cost-effectiveness must be determined for each progressively more stringent potential control option



# Technological Feasibility Challenges on Santa Catalina Island

- Challenges for the deployment of ZE and/or NZE technologies on Santa Catalina Island include:
  - Fuel must be barged
    - Limited number of daily barge trips
  - Existing facility footprint is small
    - Acquiring additional land is challenging
  - 30-day fuel storage as backup when barges unable to deliver fuel
- South Coast AQMD performed analyses which determined the fuel usage, barge trips, and space required for each repower scenario
- The proposed BARCT NO<sub>x</sub> emission limit, based on a combination of technologies comprised of 30% ZE, 65% NZE, and 5% diesel engines, was determined to be technologically feasible
- Southern California Edison (SCE) grid stability analyses could impact the units needed to repower PBGS and the proposed BARCT limit



A photograph of an industrial facility, likely a refinery or chemical plant. The image features a tall, cylindrical distillation column on the left, surrounded by a complex network of metal scaffolding, pipes, and walkways. In the background, there are several large, horizontal storage tanks and other industrial structures under a clear blue sky. A semi-transparent black rectangular box is overlaid on the right side of the image, containing white text.

# Preliminary Draft Rule Language

# Definitions (c)

## Key definitions in PAR 1135 include:

### (9) ELECTRIC GENERATING UNIT

- Added equipment located on Santa Catalina Island to the definition of an electric generating unit

### (21) SANTA CATALINA ISLAND NEAR-ZERO EMISSION (NZE) ELECTRIC GENERATING UNIT

- Any electric generating unit located on Santa Catalina Island that produces NO<sub>x</sub> emissions greater than 0.01 lb/MW-hr but less than or equal to 0.07 lb/MW-hr (demonstrated by permit condition, CARB certification, or other method approved by Executive Officer)

### (22) SANTA CATALINA ISLAND ZERO-EMISSION (ZE) ELECTRIC GENERATING UNIT

- Any electric generating unit located on Santa Catalina Island that produces NO<sub>x</sub> emissions less than 0.01 lb/MW-hr (demonstrated by permit condition, CARB certification, or other method approved by Executive Officer)





# Emission Limits for Boilers and Gas Turbines (d)(1)

## Emission Limits for Boilers and Gas Turbines

Boilers and gas turbines that do not meet the NO<sub>x</sub> emission limits

- Prohibition deadline extended from January 1, 2024 to April 1, 2024
- Provides additional time for facilities to finalize the installation of controls



# Prohibitions on Santa Catalina Island Clauses (d)(2)(A)(i) and (d)(2)(A)(ii)

## Electric Generating Units on Santa Catalina Island

### Previous rule language

- Prohibition deadline of January 1, 2024 for diesel internal combustion engines

### Proposed rule language

- Extended prohibition for diesel internal combustion engines to July 1, 2025
  - Requested by SCE in comment letter submitted July 15, 2022
  - Added due to issues following Unit 15 catalyst block installation
- Added prohibition of non-NZE or non-ZE electric generating units after July 1, 2025



# Emission Limits on Santa Catalina Island

## Clauses (d)(2)(A)(iii) and (d)(2)(A)(iv)

### Electric Generating Units on Santa Catalina Island

#### Previous rule language

- Interim limits:
  - 50 tons NOx by January 1, 2024
  - 45 tons NOx by January 1, 2025
- NOx mass emission limit 13 tons per year on and after January 1, 2026

#### Proposed rule language

- Removed first interim limit
- Second interim limit retained to ensure progress towards compliance
- Based on BARCT assessment:
  - NOx mass emission limit reduced to 1.6 tons per year on and after January 1, 2026
- Mass emission limits include startups, shutdowns, and missing data substitutions

#### Annual NOx interim limits

~~(1) 50 tons by January 1, 2024~~

**(2) 45 tons by January 1, 2025**

#### Annual NOx mass emission limit

~~13 tons~~  
**1.6 tons on and after January 1, 2026**

# Monitoring, Recordkeeping, and Reporting for Electric Generating Units (e)(3)

## Monitoring, Recordkeeping, and Reporting

### Proposed rule language

- Included monitoring and recordkeeping requirements for electric generating units  $\leq 0.4$  MW
  - Added method to determine compliance based on tracking total annual MW-hr of each unit
- Owner or operator shall maintain records of all data onsite for a minimum of five years and made available to the Executive Officer upon request
- Any electric generating unit exceeding 0.4 MW shall install a continuous emissions monitoring systems (CEMS)
  - Excludes ZE electric generating units





# Impact Assessments

# Potentially Impacted Facilities

## 32 Electricity Generating Facilities Subject to Rule 1135

- PAR 1135 primarily affects one electricity generating facility located on Santa Catalina Island
- Extended deadline by three months to comply with emission limits for boilers and gas turbines will impact remaining facilities
  - South Coast AQMD is only aware of two units possibly needing the extended deadline

### PAR 1135 Affected Equipment

Equipment Type	Number of Units
Boilers	17
Combined Cycle Gas Turbines	26
Combined Cycle Gas Turbine-Associated Duct Burners	11
Diesel Internal Combustion Engines	6
Simple Cycle Gas Turbines	73

# Emission Reductions

## Emission Reductions on Santa Catalina Island

- Based on technology assessment, South Coast AQMD proposed a BARCT limit of 1.6 tons of NO<sub>x</sub> per year for the electricity generating facility located on Santa Catalina Island
- The proposed BARCT limit is based on a repower scenario of 30% ZE, 65% NZE, 5% diesel engines providing the annual power generation (MWh/year)

	<b>30% ZE, 65% NZE, 5% Diesel Engines</b>
<b>Santa Catalina Island Baseline Emissions<sup>1</sup> (Tons/Year)</b>	<b>71.3</b>
<b>NO<sub>x</sub> Emission Reductions (Tons/Year)</b>	<b>69.7</b>
<b>BARCT NO<sub>x</sub> Emission Limit for Electricity Generating Units on Santa Catalina Island (Tons/Year)</b>	<b>1.6</b>

<sup>1</sup> Baseline NO<sub>x</sub> emissions determined by an average of Annual Emission Report data from 2017, 2019, and 2021 from prime diesel engines

# Cost-Effectiveness Analysis

**Cost-effectiveness is measured in terms of the cost in dollars per ton of air pollutant reduced**

- Cost estimates were provided by SCE and various technology vendors
- Cost-effectiveness = 
$$\frac{(\text{Annualized Capital Cost} + \text{Annual O\&M}) - \text{Existing Annual O\&M}}{\text{Estimated Annual Emissions Reductions}}$$

*Estimated Annual Emissions Reductions*

- The 2022 Air Quality Management Plan (AQMP) established a cost-effectiveness threshold of \$325,000/ton NOx reduced
- The proposed BARCT limit is below the cost-effectiveness threshold at negative \$12,000/ton NOx reduced (cost savings)

	30% ZE, 65% NZE, 5% Diesel Engines
<b>Net Annual Costs (includes annualized capital and O&amp;M costs)</b>	\$(859,000)
<b>NOx Emission Reductions (Tons/Year)</b>	69.7
<b>Cost-Effectiveness of Proposed BARCT Limit (\$/Ton of NOx Reduced)</b>	\$(12,000)



# Incremental Cost-Effectiveness Analysis

Incremental cost-effectiveness is the difference costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option

- H&SC, Section 40920.6 requires an incremental cost-effectiveness analysis for BARCT rules when there is more than one control option which would achieve the emission reduction objective
- Staff compared the proposed BARCT limit to the next most stringent repower scenario analyzed and to an all Tier 4 Final diesel engine repower scenario
- The proposed BARCT limit was determined to be incrementally cost-effective (less than \$325,000/ton NOx reduced)

	95% NZE versus 30% ZE, 65% NZE	All Tier 4 Final Diesel Engines versus 30% ZE, 65% NZE
Incremental Cost-Effectiveness for the Proposed BARCT Limit	\$(15,126,000)	\$(209,000)

# Socioeconomic Assessment and California Environmental Quality Act (CEQA)

## Socioeconomic Impact Assessment

- Will be prepared and released for public review and comment at least 30 days prior to the Public Hearing for PAR 1135

## CEQA

- Staff is preparing a Draft Subsequent Environmental Assessment (SEA), which tiers off the previously certified Final Mitigated SEA for the November 2018 Amendments to Rule 1135
- Draft SEA will be released for a public review and comment period

# Next Steps

**Ongoing meetings  
with stakeholders**

**Stationary Source  
Committee  
Meeting scheduled  
for March 17, 2023**

**Set Hearing  
scheduled for  
April 7, 2023**

**Public Hearing  
scheduled for  
May 5, 2023**

# Staff Contacts

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[PAR 1135 Proposed Rules  
Web Page](#)

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