

PROPOSED AMENDED RULES 1147 AND 1100 WORKING GROUP MEETING #9

JULY 14, 2021
SOUTH COAST AQMD
DIAMOND BAR, CA

Zoom Meeting: <https://scaqmd.zoom.us/j/96033341079>
Webinar ID: 960 3334 1079
Conference Call: (669)900-6833

AGENDA

- Summary of Previous Working Group
- Cost-Effectiveness Analysis
 - Autoclaves
- Next Steps



PREVIOUS WORKING GROUP RECAP

Working Group #8

- Provided overview of proposed implementation approach
 - Comparison of proposed approach with existing Rule 1147 requirements
 - 12 year and 32 year compliance schedules based on existing limits
- Presented cost-effectiveness analysis for:
 - Absorption chillers
 - Microturbines (Natural Gas and Distillate)
 - Other liquid fuel (Diesel Tar Pot)

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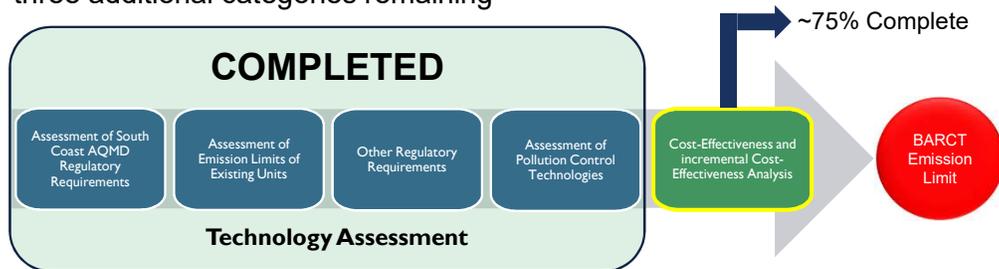
Cost-Effectiveness Analysis

STATUS OF BARCT ASSESSMENT

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PROGRESS OF RULE 1147 BARCT ASSESSMENT

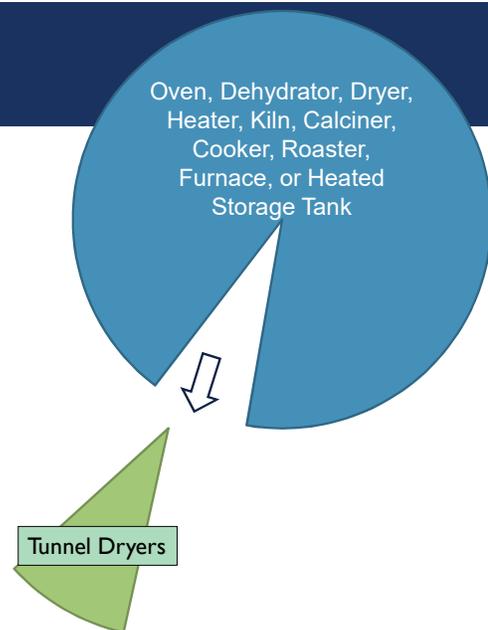
- As of Previous Working group meeting:
 - Technology Assessment has been completed for both existing Rule 1147 categories and new proposed categories
 - Cost-effectiveness analysis is in progress with nine categories completed and three additional categories remaining



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AUTOCLAVES AND TUNNEL DRYERS

- During this working group meeting, the cost-effectiveness analysis will be presented for the proposed autoclave category
- Based on stakeholder feedback, PAR 1147 will create a new equipment category for tunnel dryers
 - Staff previously identified a tunnel dryer as the only unit in the large (≥ 40 MMBtu/hr) "Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank" equipment category
 - With tunnel dryers moved into their own category, the large equipment category is no longer needed
 - Technology assessment for the Tunnel Dryer category will be presented during a future working group



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INTERIM BARCT LIMITS

- ❑ U.S. EPA has commented as facilities transition out of RECLAIM there needs to be an interim BARCT requirement until implementation of BARCT requirements in applicable landing rules
- ❑ Clean Air Act Section 110(l) prohibits the U.S. EPA from approving a revision to a SIP if the revision would interfere with any applicable requirement concerning attainment
 - RECLAIM currently establishes BARCT in aggregate
- ❑ Since implementation of PAR 1147 are based on burner age, some units may be meeting the proposed NOx BARCT limit after they transition out of RECLAIM

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PROPOSED INTERIM BARCT LIMITS

Category	Prior to Meeting Proposed Limits
	Emission Limit (@ 3% O ₂ , dry)
Former RECLAIM Facilities (Units without existing permit concentration limit)	102 ppm

- ❑ Proposing to include an interim NOx emission limits for “Former RECLAIM” facilities until operator is required to meet the proposed NOx BARCT limit
 - Will only come into effect once a RECLAIM facility becomes a “Former RECLAIM” facility
 - Based on RECLAIM default NOx emission factor of 130 lb/mmscf
- ❑ RECLAIM facilities with existing permit concentration limits will retain existing limit until required to meet proposed limits
- ❑ Non-RECLAIM facilities will continue to be subject to existing permit limits based on the current Rule 1147 limit for applicable equipment categories

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UPDATED STATUS SUMMARY OF BARCT ASSESSMENT

Cost-Effectiveness Analysis

Equipment Category	Equipment Size	Operating Temperature	Current Rule Limit [^]	Initial BARCT Limit [^]	Cost-Effectiveness	Proposed BARCT Limit
Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	All	<1,200°F	30 ppm	20 ppm	\$12,700/Ton	20 ppm
		≥1,200°F	60 ppm	30 ppm	\$5,600/Ton	30 ppm
Tunnel Dryers	≥40 MMBtu/hr	All	30 to 60 ppm	Pending	Pending	
	<40 MMBtu/hr	All	30 to 60 ppm	Pending	Pending	
Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator	All	All	60 ppm	20 ppm	\$12,300/Ton	20 ppm
Evaporator, Fryer, Heated Process Tank, and Parts Washer	All	All	60 ppm	30 ppm	\$31,300/Ton	60 ppm
Burn-off Furnace, Burnout Oven, Incinerator, Crematory with or without Integrated Afterburner	All	All	60 ppm	30 ppm	\$25,800/Ton	30 ppm
Tenter Frame, Fabric or Carpet Dryer	All	All	30 ppm	20 ppm	\$23,600/Ton	20 ppm
Other Unit and Process Temperature	All	<1,200°F	30 ppm	30 ppm	Pending Singeing Machines	
	All	≥1,200°F	60 ppm	60 ppm		

[^] NOx concentrations are corrected to 3% O₂ dry

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UPDATED STATUS SUMMARY OF BARCT ASSESSMENT (CONT'D)

Cost-Effectiveness Analysis

Equipment Category	Equipment Size	Operating Temperature	Current Rule Limit [^]	Initial BARCT Limit [^]	Cost-Effectiveness	Proposed BARCT Limit [^]
Absorption Chillers	All	All	30 ppm	20 ppm	No Additional Costs	20 ppm
Micro-Turbines (Natural Gas)	All	All	N/A	9 ppm*	No Additional Costs	9 ppm
Micro-Turbines (Distillate Fuel)	All	All	40 ppm	40 to 77 ppm*	No Additional Costs	77 ppm
Auto-Claves	All	All	30 ppm	30 ppm	Pending	
All Liquid Fuel-Fired Units	All	<1,200°F	40 ppm	40 ppm	No Additional Costs	40 ppm
	All	≥1,200°F	60 ppm	60 ppm	No Additional Costs	60 ppm

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COST-EFFECTIVENESS ANALYSIS

Autoclaves

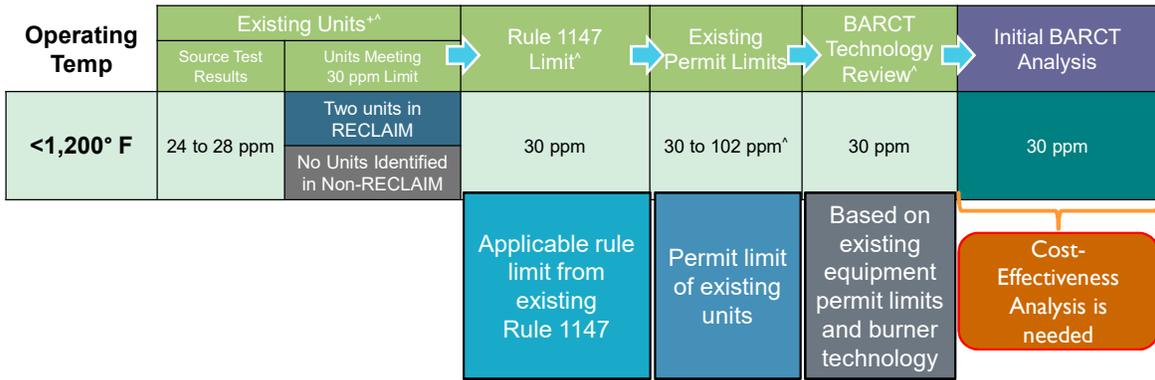
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AUTOCLAVES

- ❑ Rule 1147 currently categorizes autoclaves under the “Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank” category
- ❑ Current Rule 1147 limit for autoclaves is 30 to 60 ppm depending on process temperature
 - Autoclaves generally operate below 1,200°F
- ❑ Many autoclaves identified are electric
 - Electric autoclaves will be exempt from Rule 1147
- ❑ Autoclaves are pressure vessels certified by the American Society of Mechanical Engineers (ASME)
- ❑ Staff is proposing to move autoclaves into a separate equipment category in PAR 1147

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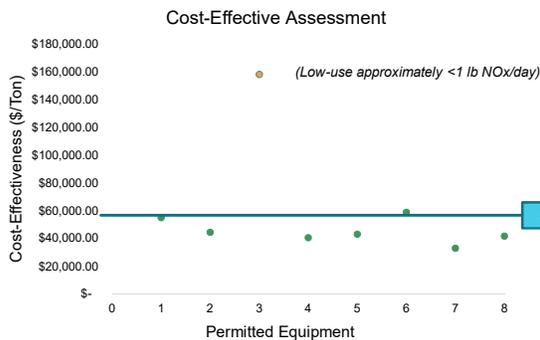
PROPOSED BARCT NOX LIMIT AUTOCLAVES



* Emissions data collected from source test results
 ^ NOx concentrations are corrected to 3% O₂ dry

COST-EFFECTIVENESS AUTOCLAVES

Cost-Effectiveness Analysis



- Cost-effectiveness calculated from:
 - Manufacturer provided cost estimates
 - Facility provided cost estimates
 - Equipment usage (AER Reported usage from 2018)
 - Proposed emission limit
- Two units with source test results below 30 ppm excluded from graph

Category Average Cost-Effectiveness: \$49,000/ton

PROPOSED BARCT NOX LIMIT AUTOCLAVES

Operating Temp	Existing Units**		Rule 1147 Limit^	Existing Permit Limits	BARCT Technology Review^	Initial BARCT Analysis
	Source Test Results	Units Meeting 20 ppm Limit				
<1,200° F	24 to 28 ppm	Two units in RECLAIM	30 ppm	30 to 102 ppm^	30 ppm	30 ppm
		No Units Identified in Non-RECLAIM				

Proposed NOx Limit for Autoclaves: 30 ppm
Category Average Cost-Effectiveness: \$49,000/ton

Staff determined that post combustion controls such as selective catalytic reduction (SCR) systems are not cost-effective for autoclaves

Incremental cost-effectiveness not conducted since only one proposed control option of 30 ppm

* Emissions data collected from source test results
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Updated

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NEXT STEPS

- Conduct technology assessment for tunnel dryers and singeing machines
- Present cost-effectiveness analysis for remaining categories
- Continue to hold stakeholder meetings
- Next Working Group Meeting – July 2021

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CONTACTS

General RECLAIM Questions	Proposed Amended Rules 1147 and 1100	Proposed Rule 1147.1	Proposed Amended Rules 1147, 1100 and Proposed Rule 1147.2
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