
PROPOSED AMENDED RULES 1147, 1100, & PROPOSED RULE 1147.1 WORKING GROUP MEETING #3

MAY 30, 2019

SOUTH COAST AQMD

DIAMOND BAR, CA

Call-in Number: 1-888-450-5996
Passcode: 325189

AGENDA

- ❑ Summary of Working Group #2
- ❑ Rule 1147 Survey Update
- ❑ PAR 1147 and PR 1147.1 Universe
- ❑ Proposed Approach for PAR 1147 and PR 1147.1
- ❑ Identifying Equipment Categories
 - ✓ ≥ 5 MMBtu/hour
 - ✓ < 5 MMBtu/hour
- ❑ BARCT Analysis Overview
- ❑ Handheld Analyzer Emissions Screening
- ❑ Next Steps

SUMMARY OF PREVIOUS WORKING GROUP

- ❑ Presented an overview of Rule 1147
 - Emission limits for equipment categories listed in the rule
 - Size distribution for various equipment categories that are above and below current Rule 1147 limits
 - Requirements for facilities to demonstrate <1 LB/day
- ❑ Emission Limit Assessments for:
 - Oven/Dryer/Heater/Furnace/Kiln/Heated Process Tanks
 - Afterburner/Thermal Oxidizer/Oxidizer/Regenerative Thermal Oxidizer
 - Autoclave
 - And more.....

RULE 1147 SURVEY UPDATE

❑ Sent to identified facilities (approximately 2944) with equipment that may be impacted by

- Proposed Amended Rule 1147
- Proposed Rule 1147.1
- Proposed Rule 1147.2
- Proposed Rule 1147.3

❑ Information used to update existing equipment information

- ✓ Age of equipment
- ✓ Approximate annual usage
- ✓ Source tested results
- ✓ Number of retrofitted units

Rule 1147 Survey – January 2019

Facility ID: _____ Company Name: _____ RECLAIM (Y/N): _____

(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
				CY 2017	CY 2018			
Permit or Application No.	Heat Input (MMBtu/HR)	Permit Limit (ppm or lb/MMscf)	Fuel Type (a-e)*	Annual Fuel Usage		Burner Retrofit (Y/N)	Unit Age (Years)	Control Device (If Applicable)
1								
2								
3								
4								
5								
6								

*See key (Page 2) for additional information.

(9)		(10)
Source Test Results (if applicable)		
Date (MM/DD/YYYY)	NOx Conc. (ppm @ 3% O ₂)	Unit Description and Process
1		
2		
3		
4		
5		
6		

Additional Comments

Instructions:

- Please provide data (1) – (10) for each piece of equipment
- Attach most recent source test data for each piece of equipment, if applicable

Prepared by: _____

Contact Phone: _____

Email: _____

Please return survey to:

South Coast Air Quality Management District
 Attn: Shawn Wang
 21865 Copley Drive
 Diamond Bar, California 91765-4178
 Or via E-mail: swang@aqmd.gov

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RULE 1147 SURVEY UPDATE

- ❑ Approximately 366 out of 2944 surveys have been received (~12% return)
- ❑ Received requests from survey recipients to allow additional time for completion
 - Survey deadline has been extended until June 14th
- ❑ Survey can be completed electronically and submitted via email
 - <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules#1147>

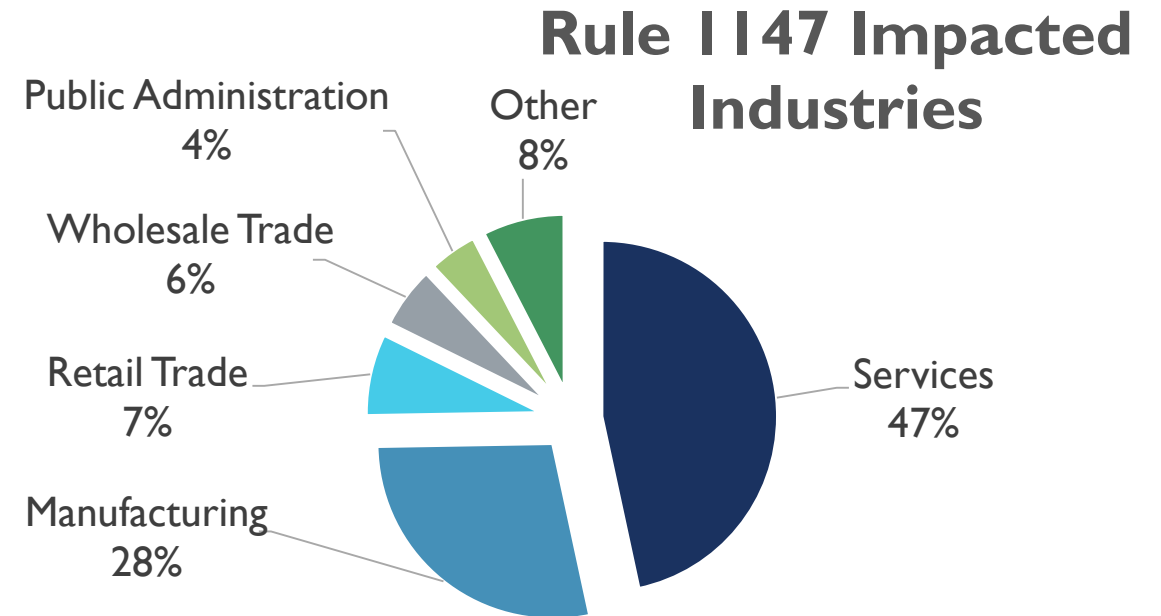
RULE 1147 UNIVERSE OVERVIEW

- ❑ Rule 1147 applies to a wide variety of facilities ranging from heavy industry to small businesses
- ❑ Equipment not included in PR 1147.1 would be subject to PAR 1147 limits
- ❑ Approximately 5307 pieces of permitted equipment located at 2967 facilities
 - Equipment list generated from active permits in 2019
 - Equipment classification spread across over 150 category codes
 - Excludes equipment covered by Proposed Rule 1147.2 and Proposed Rule 1147.3

RULE 1147 UNIVERSE OVERVIEW

□ Top 5 Impacted industries:

1. Services (47%)
2. Manufacturing (28%)
3. Retail Trade (7%)
4. Wholesale Trade (6%)
5. Public Administration (4%)

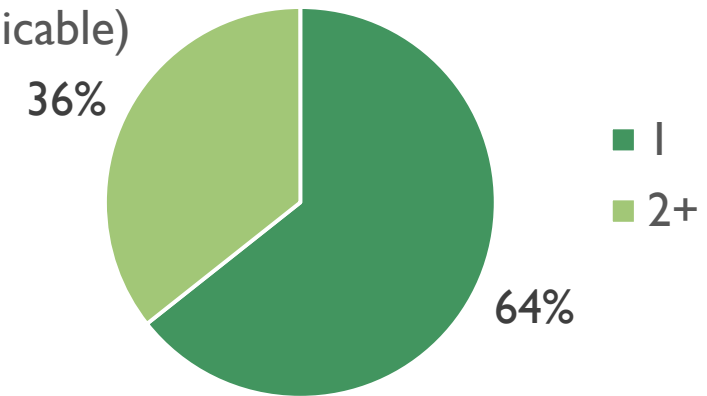


- Higher percentage representation in the services industry unlike facilities located in RECLAIM which show higher percentage representation in manufacturing

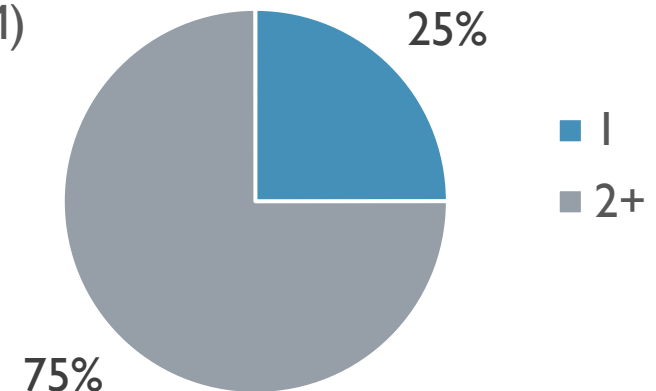
RULE 1147 UNIVERSE OVERVIEW

- Within the entire Rule 1147 universe, 64% of impacted facilities operate one piece of equipment per facility and 35% operate two or more pieces of equipment
- Within the RECLAIM Rule 1147 universe, 25% of impacted facilities operates one piece of equipment per facility and 75% operate more two or more pieces of equipment

Equipment Per Facility
(All Applicable)

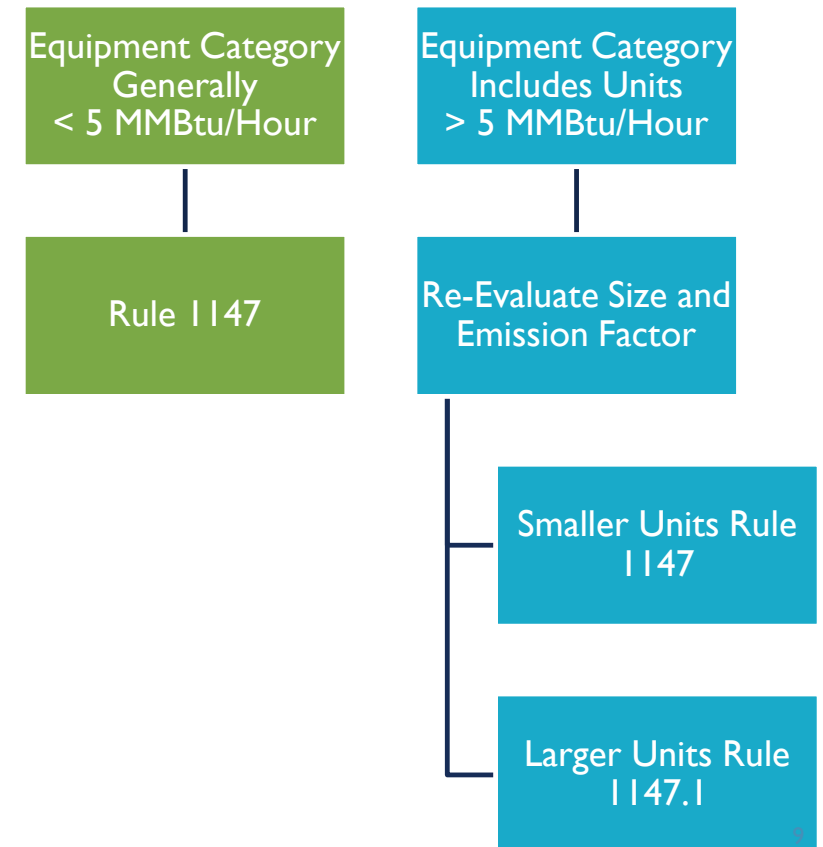


Equipment Per Facility
(RECLAIM)



PROPOSED APPROACH FOR PAR 1147 AND PR 1147.1

- ❑ Maintain Rule 1147 emission limits for equipment categories where RECLAIM units are generally <5 MM Btu/hr
 - ✓ Technology assessment for smaller equipment in Rule 1147 was conducted in February 2017
- ❑ Categories with RECLAIM equipment that is generally > 5 MM Btu/hour
 - ✓ Further analysis of data from RECLAIM and non-RECLAIM equipment to determine applicability between Rule 1147 and Proposed Rule 1147.1
 - ✓ Impacted non-RECLAIM equipment will be sampled from currently permitted equipment
- ❑ BARCT analysis will be conducted for equipment subject to PR 1147.1



RULE 1147 RECLAIM UNIVERSE EQUIPMENT OVERVIEW

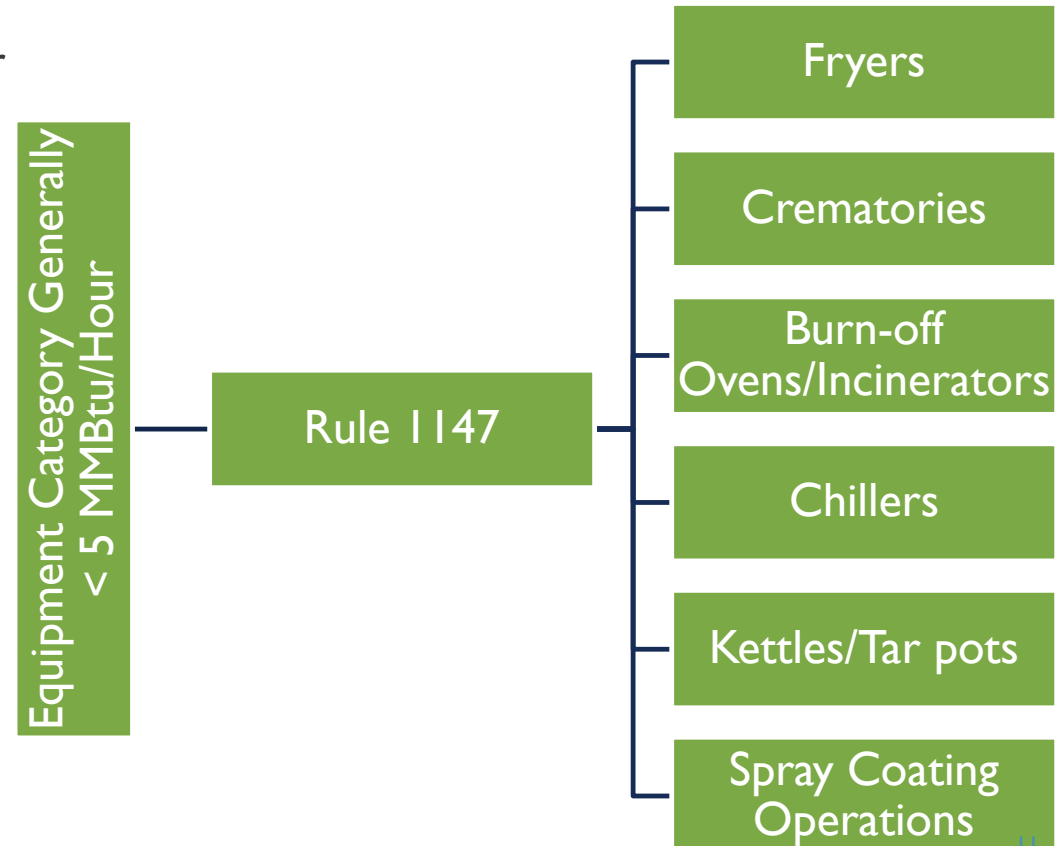
Type of Equipment	Range of Equipment Sizes (MMBtu/hour)	Total Number
Oven/Dryer/Heater/Furnace/Kiln/Heated Process Tanks	0.1 to 84	219
Afterburner/Thermal Oxidizer/Oxidizer/Regenerative Thermal Oxidizer	0.2 to 173	80
Autoclave	5.5 to 25	16
Fryer	0.6 to 4	13
Crematory	0.5 to 3.5	5
Burn-off Oven/ Incinerator	1 to 5	8
Chiller	2.5 to 5	3
Turbine (Diesel)	6.5	3
Spray Coating Operation ¹	1 to 2.5	3
Kettle/Tar Pot	0.4 to 1.5	2
Singeing Machine	8	2

¹ Some heated spray booths are permitted under heater

IDENTIFYING EQUIPMENT CATEGORIES GENERALLY <5 MMBTU/HOUR

Equipment Category
Generally < 5 MM
Btu/Hour

- ❑ At last Working Group Meeting discussed for each equipment category equipment size and emission limits for RECLAIM facilities
- ❑ Six categories were identified with equipment that is generally below 5 MM Btu/Hour
 - ✓ Fryers
 - ✓ Crematories
 - ✓ Burn-off ovens/incinerators
 - ✓ Chillers
 - ✓ Kettles/Tar pots
 - ✓ Spray coating operations
- ❑ These categories would be subject to existing Rule 1147 emission limits
 - ✓ Emission limits are either 30 or 60 ppm, depending on the equipment and process temperature



IDENTIFYING EQUIPMENT CATEGORIES GENERALLY > 5 MM BTU/HOUR

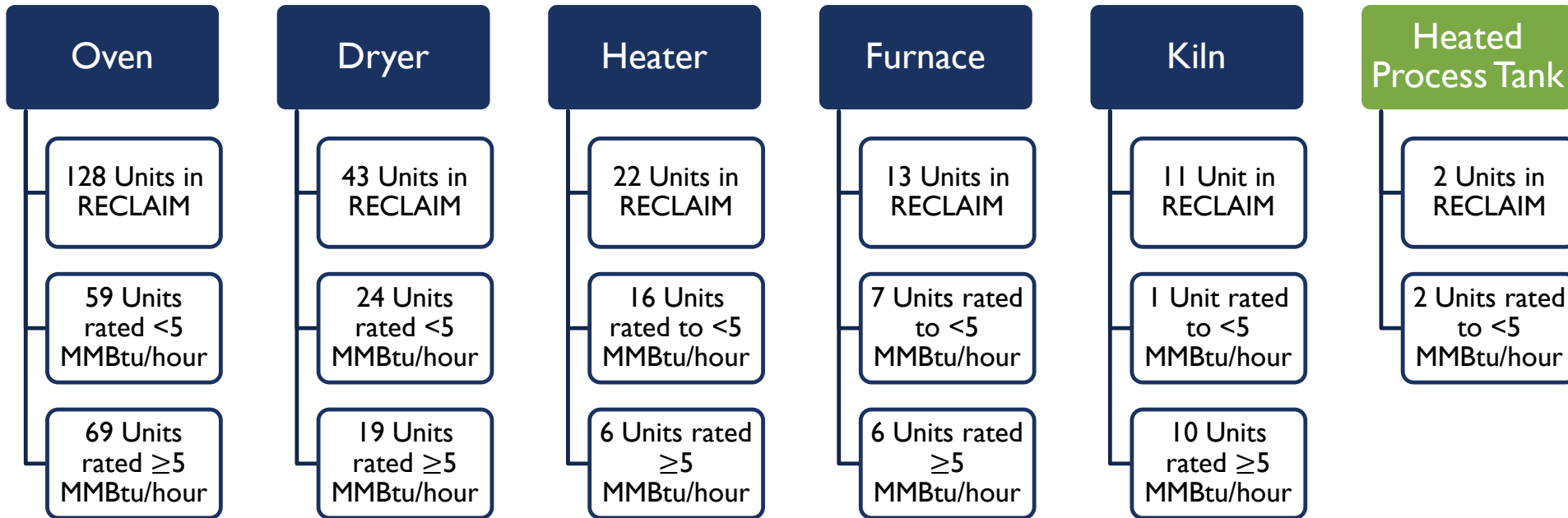
Equipment Category
Includes Units
> 5 MMBtu/Hour

- ❑ Five categories were identified with equipment that is generally above 5 MM Btu/Hour
 - ✓ Oven/Dryer/Heater/Furnace/Kiln/Heated Process Tanks
 - ✓ Afterburner/Thermal Oxidizer/Oxidizer/Regenerative Thermal Oxidizer
 - ✓ Autoclave
 - ✓ Turbine (Diesel)
 - ✓ Singeing Machine
- ❑ Additional analysis on each of these categories and sub-categories is needed to identify potential applicability for Rule 1147 and Proposed Amended Rule 1147.1

RULE 1147 RECLAIM UNIVERSE

OVEN/DRYER/HEATER/FURNACE/KILN/HEATED PROCESS TANKS

Equipment Category
Includes Units
> 5 MMBtu/Hour



219 RECLAIM Ovens, Dryers, Heaters, Furnaces, Kiln, and Heated Process Tanks

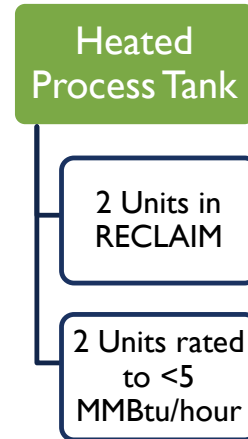
- ✓ Sizes vary across each of the six sub-categories from 0.1 to 84 mmBtu/hour
- ✓ Sizes vary within each of the six sub-categories, with the exception of heated process tanks where both units are less than 5 MMBtu/hour

INITIAL RECOMMENDATIONS FOR OVENS, DRYERS, HEATERS, FURNACES, KILNS, AND PROCESS TANKS

Equipment Category
Includes Units
> 5 MMBtu/Hour

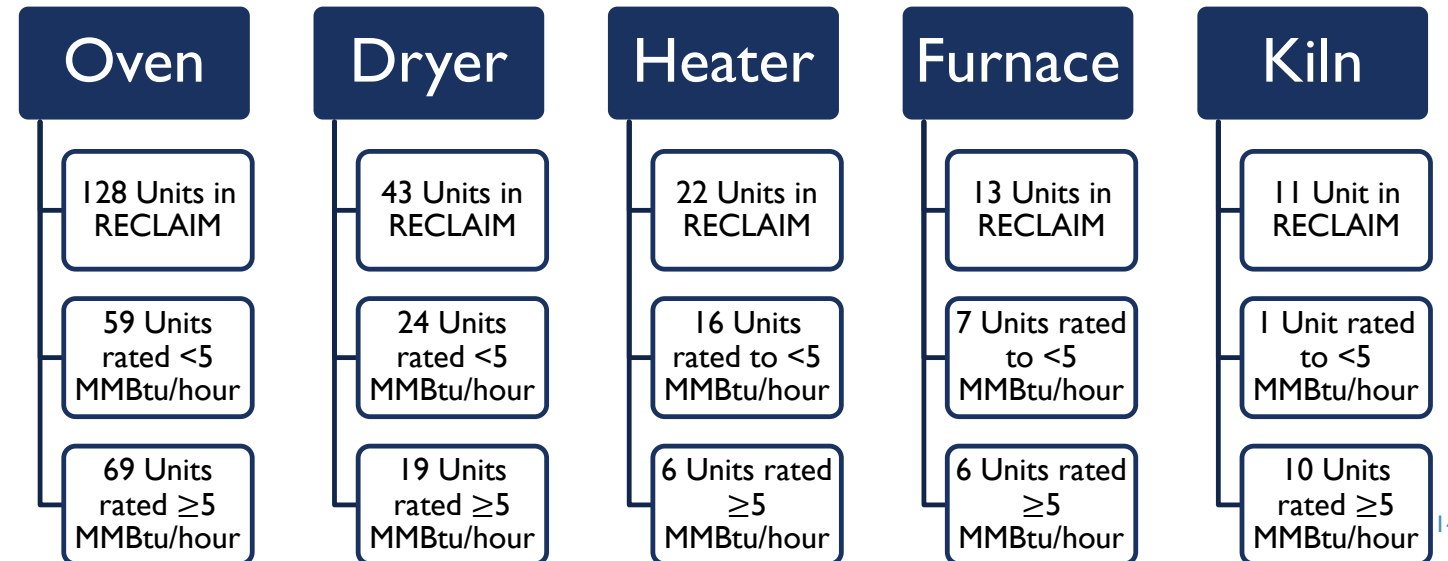
Heated process tanks

- ✓ Both tanks in RECLAIM are < 5 MMBtu/hour
- ✓ Heated process tanks would be subject to existing Rule 1147 emission limits of 60 ppm



Ovens, dryers, heaters, furnaces, and kilns

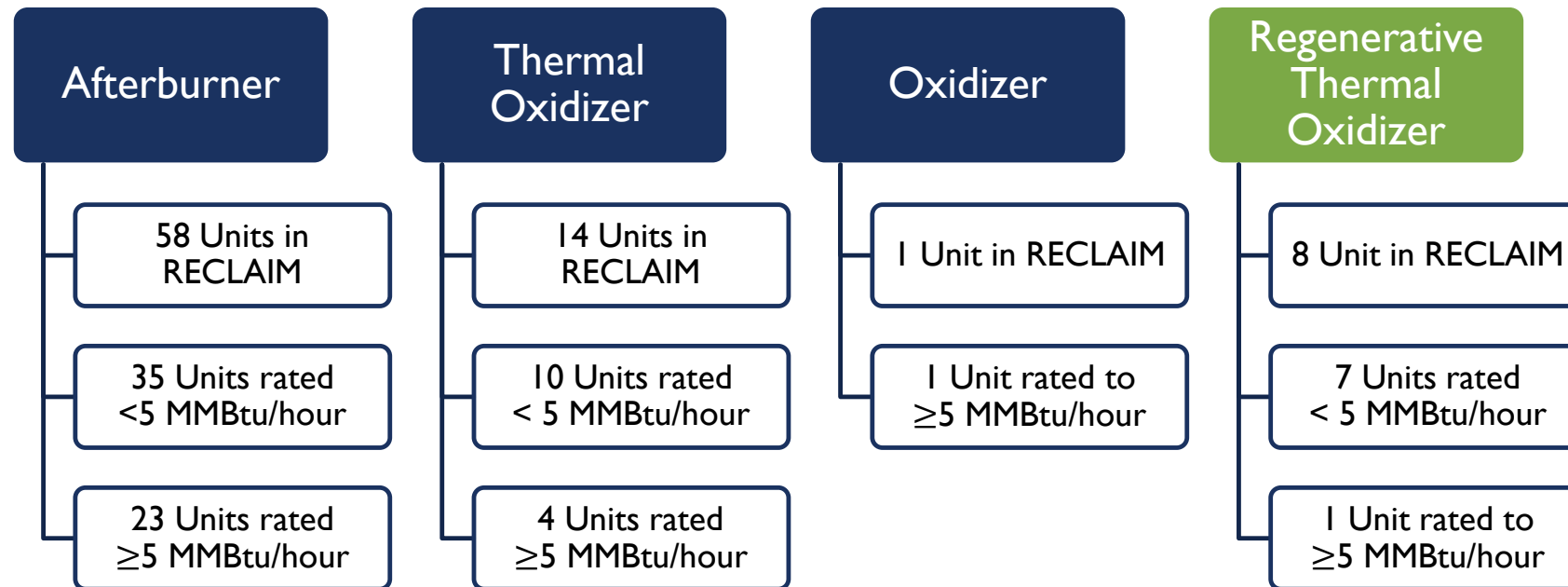
- ✓ Address units in Proposed Rule 1147.1
- ✓ Recommending a more specific BARCT analysis for each of these five sub-categories
- ✓ Further evaluate each sub-category to determine if equipment is in correct classification



RULE 1147 RECLAIM UNIVERSE

AFTERBURNER/THERMAL OXIDIZER/OXIDIZER/REGENERATIVE THERMAL OXIDIZER

Equipment Category
Includes Units
> 5 MMBtu/Hour



- 80 RECLAIM afterburners, thermal oxidizers, oxidizers, and regenerative thermal oxidizers
 - ✓ Sizes vary across each of the four sub-categories from 0.17 to 173 mmBtu/hour
 - ✓ Sizes vary within each of the three sub-categories afterburner, thermal oxidizers, and oxidizers
- ✓ All regenerative thermal oxidizers are < 5.5 MMBtu/hour

INITIAL RECOMMENDATIONS FOR AFTERBURNERS, THERMAL OXIDIZERS, OXIDIZERS, AND REGENERATIVE THERMAL OXIDIZERS

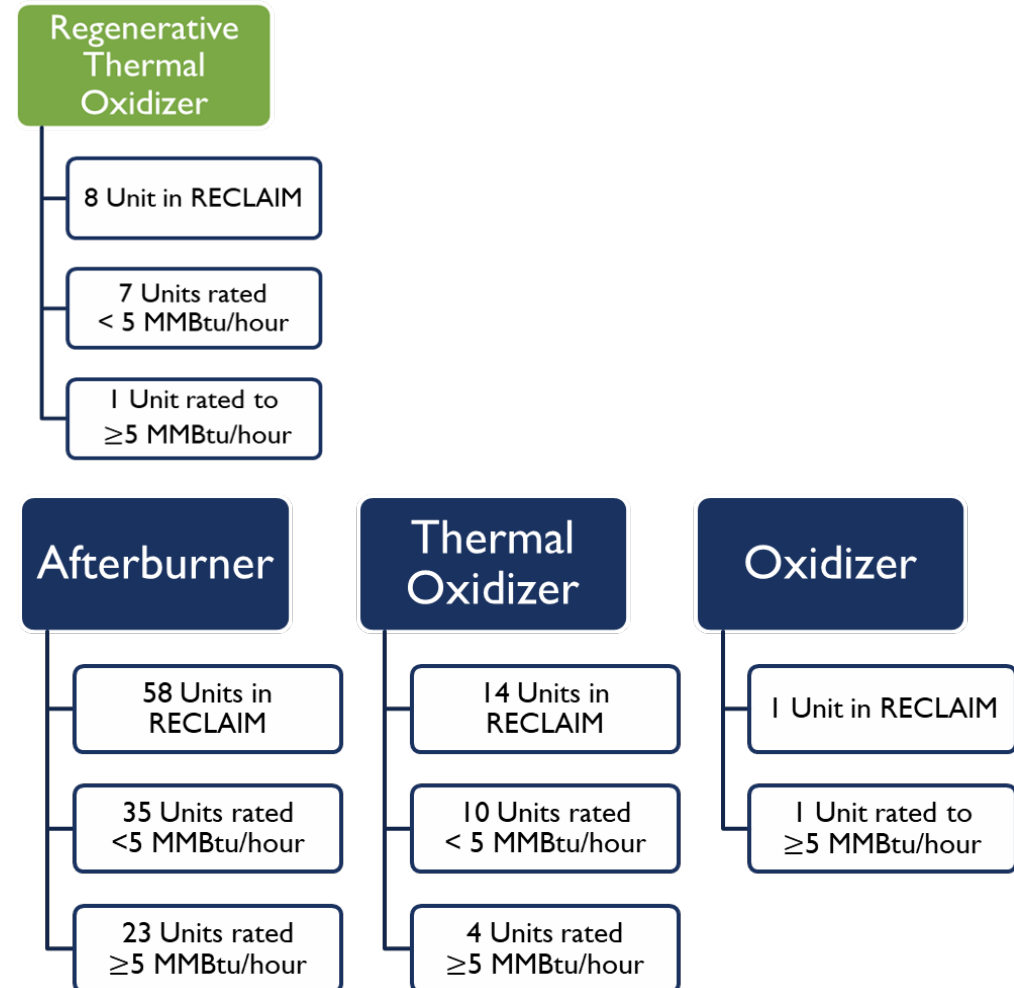
Equipment Category
Includes Units
> 5 MMBtu/Hour

❑ Regenerative thermal oxidizers

- ✓ All 9 regenerative thermal oxidizers in RECLAIM are < 5.5 MMBtu/hour
- ✓ Regenerative thermal oxidizers would be subject to the Rule 1147 emission limit of 60 ppm

❑ Afterburners, thermal oxidizers, and oxidizers

- ✓ Address units in Proposed Rule 1147.1
- ✓ Recommending a more specific BARCT analysis for each of these five sub-categories
- ✓ Further evaluate each sub-category to determine if equipment is in correct classification



RULE 1147 RECLAIM UNIVERSE AUTOCLAVES

Equipment Category
Includes Units
> 5 MMBtu/Hour

❑ 16 autoclaves in RECLAIM

- ✓ All 16 RECLAIM units are rated >5 MMBtu/hour (5.5 to 25 MMBtu/hour)
- ✓ 13 RECLAIM units use the default emission limit of 102 ppm (130 lbs/mmscf)

❑ Rule 1147 emission limit is between 30 to 60 ppm for these units depending on process temperature

❑ Initial recommendations

- ✓ Address units in Proposed Rule 1147.1
- ✓ Conduct a BARCT analysis for autoclaves
- ✓ Emissions testing may be needed to better quantify baseline emissions from units using default emission limit
- ✓ Analyze other equipment categories to determine if equipment is under correct classification

Autoclave

16 Units in
RECLAIM

16 Units
rated ≥ 5
MMBtu/hour

RULE 1147 RECLAIM UNIVERSE MICRO-TURBINES (DIESEL)

Equipment Category
Includes Units
> 5 MMBtu/Hour

❑ 3 diesel fired micro-turbines in RECLAIM

- ✓ All 3 units are 6.5 MM Btu/hour
- ✓ Permitted emission limit for all 3 units is 77 ppm

❑ Rule 1147 emission limit is 40 ppm

- ✓ Staff not aware of micro-turbines at non-RECLAIM facilities

❑ Initial recommendations

- ✓ Address units in Proposed Rule 1147.1
- ✓ Conduct a BARCT analysis for diesel micro-turbines since no known units in non-RECLAIM
- ✓ Allows for reassessment of 40 ppm emission limit

Micro-Turbines
(Diesel)

3 Units in
RECLAIM

3 Units
rated ≥ 5
MMBtu/hour

RULE 1147 RECLAIM UNIVERSE SINGEING MACHINES

Equipment Category
Includes Units
> 5 MMBtu/Hour

- ❑ 2 singeing machines in RECLAIM
 - ✓ Both units are 8 MM Btu/hour
 - ✓ Both units use the default emission limit of 102 ppm (130 lbs/mmscf)
- ❑ Rule 1147 emission limit is 30 ppm for these units
 - ❑ No known singeing machines at non-RECLAIM facilities
- ❑ Initial recommendations
 - ✓ Address units in Proposed Rule 1147.1
 - ✓ Conduct a BARCT analysis for singeing machines since no known units in non-RECLAIM
 - ✓ Allows for reassessment of 30 ppm emission limit

Singeing Machines

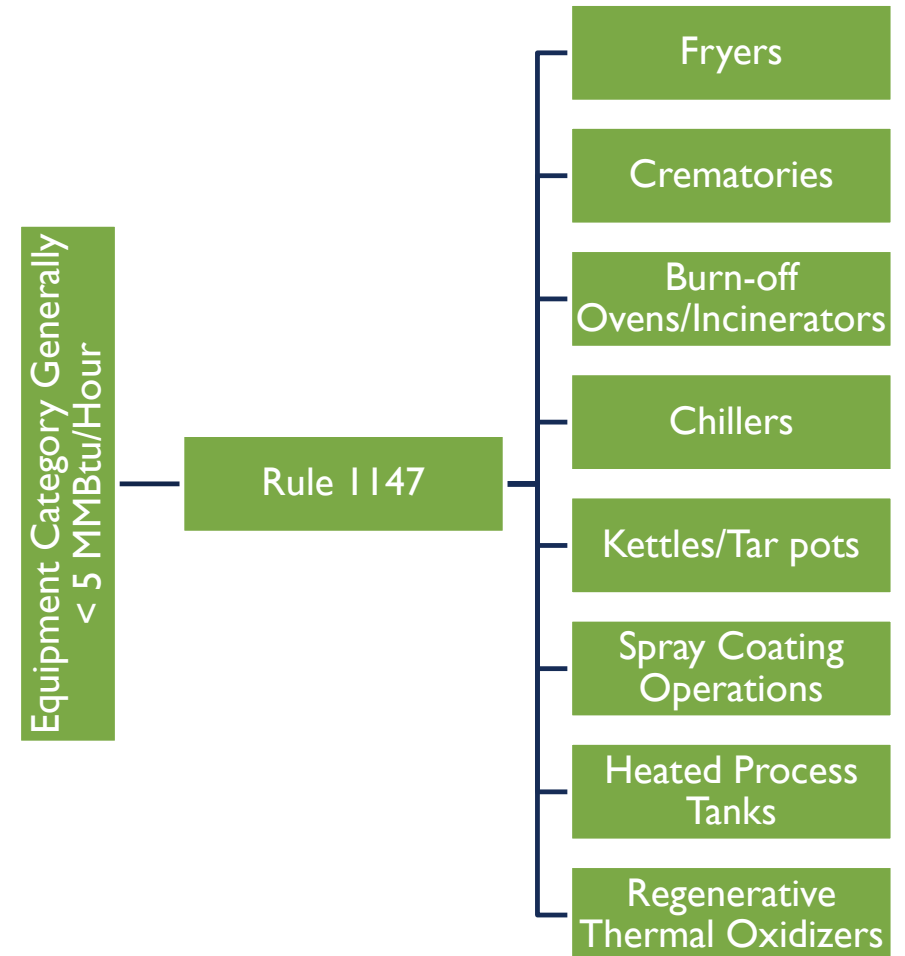
2 Units in
RECLAIM

2 Units
rated ≥ 5
MMBtu/hour

SUMMARY OF INITIAL RECOMMENDATIONS FOR EQUIPMENT CATEGORIES WITH UNITS > 5 MMBTU/HOUR

Equipment Category
Includes Units
> 5 MMBtu/Hour

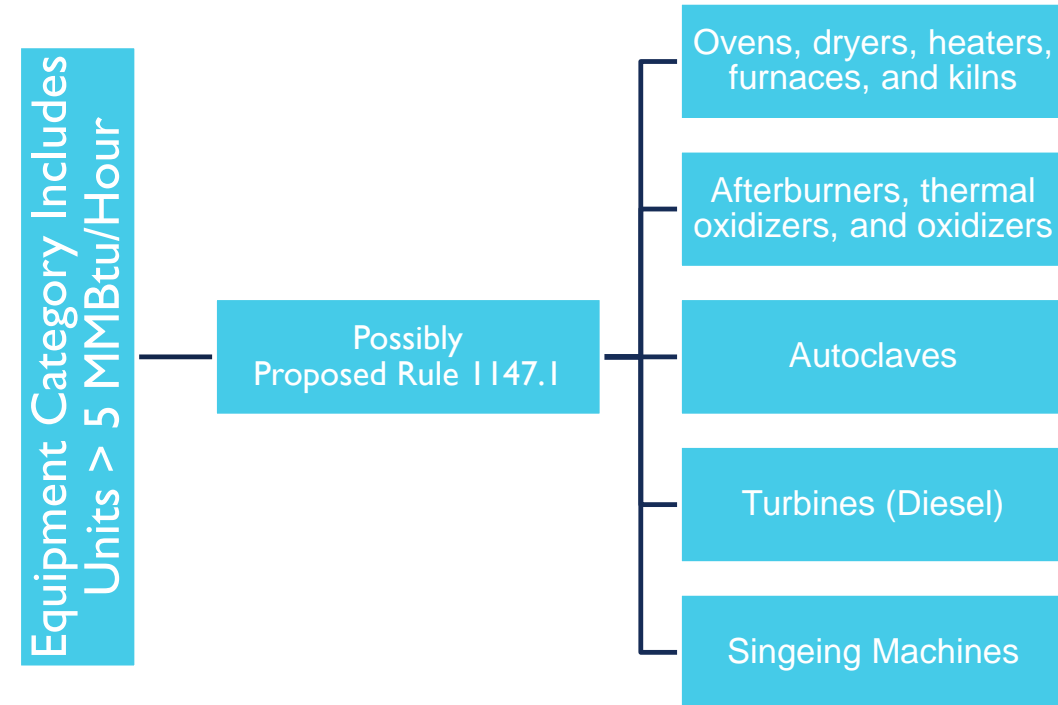
- ❑ Further analysis of equipment categories with units > 5 MMBtu/hour identified two subcategories with units that are generally < 5 MMBtu/hour
 - ✓ Heated process tanks
 - ✓ Regenerative thermal oxidizers
- ❑ These units would be subject to the NOx emission limits under Rule 1147



SUMMARY OF INITIAL RECOMMENDATIONS FOR EQUIPMENT CATEGORIES WITH UNITS > 5 MMBTU/HOUR (CONTINUED)

Equipment Category
Includes Units
> 5 MMBtu/Hour

- ❑ Staff is proposing to address the following equipment under Proposed Rule 1147.1:
 - ✓ Ovens, dryers, heaters, furnaces, and kilns
 - ✓ Afterburners, thermal oxidizers, and oxidizers
 - ✓ Autoclaves
 - ✓ Turbines (Diesel)
 - ✓ Singeing Machines
- ❑ BARCT analysis will be conducted for these equipment categories
- ❑ Additional analysis may be needed as indicated in previous slides



BARCT ANALYSIS*+ OVERVIEW

***BARCT analysis is conducted for each equipment category and fuel type**

+This analysis does not include equipment from PR 1147.2 and 1147.3 universe

Assessment of
South Coast
AQMD
Regulatory
Requirements

Assessment of
Emission Limits
of Existing Units

Other
Regulatory
Requirements

Assessment of
Pollution
Control
Technologies

Technology Assessment

Initial BARCT
Emission Limit
and Other
Considerations

Cost
Effectiveness
Analysis

**BARCT
Emission
Limit**

HANDHELD ANALYZER EMISSIONS SCREENING

- ❑ South Coast AQMD Staff will be conducting emissions screenings equipment with RECLAIM default NOx emission factor of 130 lbs/mmscf
 - ✓ Emissions will be monitored by a handheld analyzer
 - ✓ Analyzers will be calibrated and operated by South Coast AQMD source test engineers
- ❑ The purpose of this exercise is to determine the actual NOx emissions of those equipment in order to better understand the possible emission reductions associated with PAR 1147 series
- ❑ Facilities with applicable equipment will be contacted to schedule initial site visits and emissions testing

NEXT STEPS



Schedule emissions screening with applicable facilities

Continue to evaluate survey results

Continue BARCT Analysis - Sample equipment from all applicable Rule 1147 categories

Next Working Group Meeting – Mid July

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