PROPOSED AMENDED RULES 1147 AND 1100
WORKING GROUP MEETING #8

MARCH 10, 2021
SOUTH COAST AQMD
DIAMOND BAR, CA

Zoom Meeting: https://scaqmd.zoom.us/j/91386076148
Meeting ID: 913 8607 6148
Passcode: 053701
Conference Call: 1 (669) 900-6833

AGENDA

- Summary of Previous Working Group
- Proposed Implementation Approach
- Status of BARCT Assessment
- Cost-Effectiveness Analysis
  - Absorption Chillers
  - Microturbines
    - (Distillate Fuel/Natural Gas)
  - Diesel Tar Pot
- Next Steps
PREVIOUS WORKING GROUP RECAP

Working Group #7

- Presented cost-effectiveness analysis for:
  - Afterburner, Thermal Oxidizer, RTO, and Oxidizer
  - Evaporator, Fryer, Heated Process Tank, and Parts Washer
  - Burn-off Furnace, Burnout Oven, Incinerator, Crematory with or without Integrated Afterburner
  - Tenter Frame, Fabric or Carpet Dryer

PROPOSED IMPLEMENTATION APPROACH
Overview of Existing Rule 1147 Implementation Approach

- The current approach for Rule 1147 is to have "units" comply with rule limits based on the daily emissions and unit age
  - Units with NOx emissions ≥1 pound per day are required to comply when unit is 15 years old
  - Units with NOx emissions <1 pound per day are required to comply when unit is 35 years old
    - Option to allow continued operation with biennial testing
- Units are required to comply with rule limit by July 1 of the year unit meets age requirements and submit permit applications by December 1 of the year prior

Overview of Proposed Implementation Approach

- Staff is proposing an implementation approach for RECLAIM and non-RECLAIM facilities, that is generally modeled after existing Rule 1147
- Two implementation schedules
  - All units, except low-emitting or near-limit units, must submit permit applications to meet the proposed NOx and CO limits when the burner reaches 12 years
  - Low-emitting or near-limit units must submit permit applications to meet the proposed NOx and CO limits when the burner reaches 32 years
- Regardless of the implementation schedule, the proposed NOx and CO limits must be met if there is a combustion system modification, combustion system or burner replacement, unit relocation, or unit replacement
- Units that meet the proposed NOx and CO limits through a source test will not be required to replace their burner; however, operators may need to modify their permit to reflect the proposed BARCT limit
Proposed Compliance for Units Subject to 12 Year Provisions

- When the burner reaches 12 years, the operator must:
  1. By the following January 1st, submit a permit application to meet the proposed NOx and CO limits
  2. Meet proposed NOx and CO limits 12 months after the permit to construct is issued
- Assuming an 18-month permit approval process, operators must meet the proposed NOx and CO limits when the burner is about 15 years old – similar to the 15 years allowed under Rule 1147
- Basing this provision on burner age instead of unit age ensures that all units meet the proposed NOx and CO limits
- The “two-step” implementation ensures that the operator has the full 12 months to meet the proposed NOx and CO limits once permit to construct is issued

Proposed Compliance for Units Subject to 32 Year Provisions

- PAR 1147 expands this concept for low-emitting units to also include units that are near the proposed NOx limit referred to as “near-limit units”
- For low-emitting and near-limit units, when the burner reaches 32 years the operator must:
  - First: Submit a permit application to meet the proposed NOx and CO limits (6 months to submit permit application)
  - Second: Meet proposed NOx and CO limits 12 months after the permit to construct is issued
- Requiring operators to meet the proposed NOx and CO limits when the burner about 35 years old is similar to the 35 years allowed under Rule 1147
- The “two-step” implementation ensures that the operator has the full 12 months to meet the proposed NOx and CO limits once a permit to construct is issued
Defining Low-Emitting and Near-Limit Units Subject to 32 Year Provision

- PAR 1147 will use the same threshold as existing Rule 1147 for defining low-emitting units at < 1 lb/day
  - Units that qualify as low-emitting to meet proposed NOx and CO limits when the burner reaches 35 years
- Propose near-limit units with a permit limit at or below existing Rule 1147 limits
  - This approach will address units with high cost-effectiveness values, but still requires that operators to meet the proposed NOx limit when the burner reaches 35 years
  - Use of a near-limit provision may also include other conditions such as limiting annual capacity factor\(^1\) to address higher use units that are near limit and cost-effective to meet the proposed NOx emission limit

\(^1\) Annual capacity factor threshold will be calculated per equipment category

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### SUMMARY OF IMPLEMENTATION APPROACH

1. **Existing Equipment**
   - **1st Filter**
     - Units At or Below BARCT Limit
     - Units already meet BARCT limit, no further action required
   - **2nd Filter**
     - Low-Emitting* or Near Limit*
     - Delayed application date for unit to comply until 32 years of age, no additional costs

2. **Submit Application To Comply with BARCT When Unit Becomes 12 Years of Age**

3. **Cost-effectiveness calculated to account for in-use units currently beyond 15 years of age**

*Low-emitting units are defined as equipment with NOx emissions of below 1 pound per day as determined by Rule 1147(c)(6)*

*Near limit units are defined as equipment that are in compliance with existing Rule 1147 limits with low annual capacity factor*
Implementation Timelines (≥1 Pound Per Day NOx)

Original Rule 1147 Timeline
- Original Unit Install Date
- 14 Years and 5 Months* Submit Permit Application
- 7 Months

PAR 1147 Timeline
- Original Unit Install Date
- 12 Years*
- 6 Months
- 18 Months** Submit Permit Application
- 12 Months Permit to Construct Issued
- Comply with Proposed Limit at 15 years

* Not to scale
** Permitting timeline subject to vary, assume permit to construct to be issued after 6 months of application submittal

Implementation Timelines (<1 Pound Per Day NOx)

Original Rule 1147 Timeline
- Original Unit Install Date
- 34 Years and 5 Months* Submit Permit Application
- 7 Months

PAR 1147 Timeline
- Original Unit Install Date
- 32 Years*
- 6 Months
- 18 Months** Submit Permit Application
- 12 Months Permit to Construct Issued
- Comply with Proposed Limit at 35 years

* Not to scale
** Permitting timeline subject to vary, assume permit to construct to be issued after 6 months of application submittal
## Summary of Implementation Approach for RECLAIM and Non-RECLAIM

<table>
<thead>
<tr>
<th>Applicability</th>
<th>Implementation</th>
</tr>
</thead>
</table>
| All Units (Except Low-Emitting and Near Limit Units) | - Beginning July 1, 2021 and every July thereafter, when a burner reaches 12 years submit a permit application by January 1st of the following calendar year that the burner reaches 12 years  
  - Must meet proposed NOx and CO limit 12 months after Permit to Construct is issued |
| Low-Emitting Units                                 | - Beginning July 1, 2021 and every July thereafter, when a burner reaches 32 years submit a permit application by January 1st of the following calendar year that the burner reaches 32 years  
  - Must meet proposed NOx and CO limit 12 months after Permit to Construct is issued |
| Near-Limit Units                                   | - Regardless of the implementation schedule above, operators must meet proposed NOx limit if there is a combustion system modification, combustion system or burner replacement, unit relocation, or unit replacement  
  - Regardless of the implementation schedule above, operators must meet proposed CO limit at the time of meeting proposed NOx limit |

1 Annual capacity factor threshold will be calculated per equipment category

### Status of BARCT Assessment

Cost-Effectiveness Analysis
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 six categories completed and analysis of six additional categories remaining.

Based on stakeholder feedback, new equipment categories are proposed to be included in Proposed Amended Rule 1147 that were previously categorized in existing categories.

During this working group meeting, the cost-effectiveness analysis will be presented for the following categories:

- Absorption Chillers
- Microturbines (natural gas)
- Microturbines (distillate fuel)
- Diesel Tar Pot
### STATUS SUMMARY OF BARCT ASSESSMENT

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Equipment Size</th>
<th>Operating Temperature</th>
<th>Current Rule Limit</th>
<th>Initial BARCT Limit(^*)</th>
<th>Cost-Effectiveness(^*)</th>
<th>Proposed BARCT Limit^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oven, Dehydrator, Dryer, Heater, Kiln, Calcinier, Cooker, Roaster, Furnace, or Heated Storage Tank</td>
<td>&lt;40 MMBtu/hr</td>
<td>&lt;1,200°F</td>
<td>30 ppm</td>
<td>20 ppm</td>
<td>$12,700/Ton</td>
<td>20 ppm</td>
</tr>
<tr>
<td></td>
<td>≥40 MMBtu/hr</td>
<td>≥1,200°F</td>
<td>60 ppm</td>
<td>30 ppm</td>
<td>$5,600/Ton</td>
<td>30 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;1,200°F</td>
<td>30 ppm</td>
<td>5 ppm</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥1,200°F</td>
<td>60 ppm</td>
<td>5 ppm</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td>Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator</td>
<td>All</td>
<td>All</td>
<td>60 ppm</td>
<td>20 ppm</td>
<td>$12,300/Ton</td>
<td>20 ppm</td>
</tr>
<tr>
<td>Evaporator, Fryer, Heated Process Tank, and Parts Washer</td>
<td>All</td>
<td>All</td>
<td>60 ppm</td>
<td>30 ppm</td>
<td>$31,300/Ton</td>
<td>60 ppm</td>
</tr>
<tr>
<td>Burn-off Furnace, Burnout Oven, Incinerator, Crematory with or without Integrated Afterburner</td>
<td>All</td>
<td>All</td>
<td>60 ppm</td>
<td>30 ppm</td>
<td>$25,800/Ton</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Tenter Frame, Fabric or Carpet Dryer</td>
<td>All</td>
<td>All</td>
<td>60 ppm</td>
<td>20 ppm</td>
<td>$23,600/Ton</td>
<td>20 ppm</td>
</tr>
<tr>
<td>Other Unit and Process Temperature</td>
<td>All</td>
<td>&lt;1,200°F</td>
<td>30 ppm</td>
<td>No Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>≥1,200°F</td>
<td>60 ppm</td>
<td>No Change</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^ NOx concentrations are corrected to 3% O\(_2\) dry
\(^*\) Cost-effectiveness for RECLAIM facilities to meet NOx limit by January 1, 2024

### STATUS SUMMARY OF BARCT ASSESSMENT (CONT’D)

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Equipment Size</th>
<th>Operating Temperature</th>
<th>Current Rule Limit(^*)</th>
<th>Initial BARCT Limit(^*)</th>
<th>Cost-Effectiveness</th>
<th>Proposed BARCT Limit^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption Chillers</td>
<td>All</td>
<td>All</td>
<td>30 ppm</td>
<td>20 ppm</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td>Micro-Turbines (Natural Gas)</td>
<td>All</td>
<td>All</td>
<td>N/A</td>
<td>9 ppm(^*)</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td>Micro-Turbines (Distillate Fuel)</td>
<td>All</td>
<td>All</td>
<td>40 ppm</td>
<td>77 ppm(^*)</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td>Auto-Claves</td>
<td>All</td>
<td>All</td>
<td>30 ppm</td>
<td>30 ppm</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td>All Liquid Fuel-Fired Units</td>
<td>All</td>
<td>&lt;1,200°F</td>
<td>40 ppm</td>
<td>40 ppm</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>≥1,200°F</td>
<td>60 ppm</td>
<td>60 ppm</td>
<td>Pending</td>
<td></td>
</tr>
</tbody>
</table>

\(^*\) NOx concentrations are corrected to 3% O\(_2\) dry
\(^*\) NOx concentrations for microturbines are corrected to 15% O\(_2\) dry
**COST-EFFECTIVENESS ANALYSIS**

Absorption Chillers

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**COST-EFFECTIVENESS BASED ON**

- **1st Filter**
  - Units At or Below BARCT Limit
  - No cost-effectiveness analysis performed – No additional cost since unit meets proposed limit

- **2nd Filter**
  - Low-Emitting* or Near Limit*
  - No cost-effectiveness analysis performed – No early burner replacement

- **Submit Application To Comply with BARCT When Unit Becomes 12 Years of Age**
  - Cost-effectiveness analysis performed for remaining units to recognize some units use a burner beyond 15 years

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*Low-emitting units are defined as equipment with NOx emissions of below 1 pound per day as determined by Rule 1147(c)(6)*

*Near limit units are defined as equipment that are in compliance with existing Rule 1147 limits with annual fuel usage of <90 MMSCF*
ABSORPTION CHILLERS - BACKGROUND

- Rule 1147 currently categorizes absorption chillers under the “Other Unit and Process Temperature”
- Current Rule 1147 limit for the “other” category is 30 to 60 ppm depending on process temperature
  - Staff is proposing a separate category for absorption chillers within Rule 1147

INITIAL BARCT NOx LIMIT FOR ABSORPTION CHILLERS

- Staff is recommending an initial BARCT NOx limit of 20 ppm
- Identified 23 units applicable to the absorption chiller category
  - Permit limits for all units are at 20 ppm NOx
  - Source test results available for 12 of the 23 units that ranged between 5 to 19 ppm
IMPLEMENTATION APPROACH
ABSORPTION CHILLERS

Absorption Chillers

1st Filter
Units At or Below BARCT Limit

2nd Filter
Low-Emitting\(^*\) or Near Limit\(^*\)

All identified units are permitted at or below initial BARCT NOx limit of 20 ppm - no additional costs

\(^*\) Low-emitting units are defined as equipment with NOx emissions of below 1 pound per day as determined by Rule 1147(c)(6)

\(^*\) Near limit units are defined as equipment that are in compliance with existing Rule 1147 limits

PROPOSED BARCT NOX LIMIT
ABSORPTION CHILLERS

<table>
<thead>
<tr>
<th>Operating Temp</th>
<th>Existing Units**</th>
<th>Rule 1147 Limit(^*)</th>
<th>Existing Permit Limits</th>
<th>BARCT Technology Review(^*)</th>
<th>Initial BARCT Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt;1,200^\circ F)</td>
<td>5 to 20 ppm</td>
<td>3 of 3 RECLAIM</td>
<td>30 ppm</td>
<td>20 ppm(^*)</td>
<td>20 ppm</td>
</tr>
<tr>
<td></td>
<td>9 of 9 Non-RECLAIM</td>
<td>9 of 9 Non-RECLAIM</td>
<td>9 of 9 Non-RECLAIM</td>
<td>9 of 9 Non-RECLAIM</td>
<td>9 of 9 Non-RECLAIM</td>
</tr>
</tbody>
</table>

Proposed NOx Limit for Absorption Chillers: 20 ppm
No additional cost since all units currently permitted at or below proposed NOx limit

\(^*\) Emissions data collected from source test results

\(^*\) NOx concentrations are corrected to 3% O\(_2\) dry

\(^*\) Oxygen correction for NOx concentrations vary depending on regulatory agency

\(^*\) Sacramento Metropolitan AQMD Rule 419: [http://www.airquality.org/ProgramCoordination/Documents/rule419.pdf](http://www.airquality.org/ProgramCoordination/Documents/rule419.pdf)
MICROTURBINES
(DISTILLATE FUEL)

- Microturbines <0.3 MW are not currently regulated in any South Coast AQMD Rule
- Distillate fuel microturbines are currently under the “liquid fuel” category in Rule 1147
  - Staff’s proposal will create a new Rule 1147 category for liquid fuel-fired Microturbines
- Units fired on liquid fuel are subject to a NOx limit of 40 ppm @ 3% O₂
- Oxygen correction for turbine emissions is 15%

CATEGORY BACKGROUND
MICROTURBINES (DISTILLATE FUEL)

- Staff is recommending an initial BARCT NOx limit of 77 ppm
- Identified three distillate fuel turbines, all located at one RECLAIM facility
  - Units are fueled with diesel fuel
- Units are rated to 6.46 MMBtu/hr and used as back-up for commercial airplane starter turbines
  - Permit limit of 77 ppm NOx @ 15% O₂
  - Source test results from three units ranged between 65 to 68 ppm
IMPLEMENTATION APPROACH
MICROTURBINES (DISTILLATE FUEL)

All identified units are permitted at or below initial BARCT NOx limit of 77 ppm - no additional costs

* Low-emitting units are defined as equipment with NOx emissions of below 1 pound per day as determined by Rule 1147(c)(6)
* Near limit units are defined as equipment that are in compliance with existing Rule 1147 limits

PROPOSED BARCT NOX LIMIT
MICRO-TURBINES (DISTILLATE FUEL)

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Existing Units*</th>
<th>Rule 1147 Limit*</th>
<th>Existing Permit Limits</th>
<th>BARCT Technology Review*</th>
<th>Initial BARCT Limit*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillate Fuel</td>
<td>65 to 68 ppm</td>
<td>3 of 3 RECLAIM</td>
<td>40 ppm</td>
<td>77 ppm</td>
<td>77 ppm</td>
</tr>
</tbody>
</table>

Proposed NOx Limit for Distillate Fuel Microturbines: 77 ppm
No additional cost since all units currently permitted at or below proposed NOx limit

* Emissions data collected from source test results
* NOx concentrations are corrected to 15% O2, dry
MICROTURBINES (NATURAL GAS)

- Microturbines <0.3 MW are not currently regulated in any South Coast AQMD Rule
  - Staff’s proposal will create a new Rule 1147 category for natural gas fired Microturbines
- BACT for this category is 9 ppm NOx @ 15% O₂

CATEGORICAL BACKGROUND
MICROTURBINES (NATURAL GAS)

- Staff is recommending an initial BARCT NOx limit of 9 ppm
- Identified 32 natural gas microturbines
  - 29 out of 32 units are permitted to 9 ppm
    - Source tests evaluated for 14 units with results between 3 to 5 ppm corrected to 15% O₂
  - 3 out of 32 units are permitted to 25 ppm
    - All three units source test results show emissions between 2 to 4 ppm corrected to 15% O₂

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IMPLEMENTATION APPROACH
MICROTURBINES (NATURAL GAS)

All identified units are permitted or operating at or below initial BARCT NOx limit of 9 ppm - no additional costs.

Low-emitting units are defined as equipment with NOx emissions of below 1 pound per day as determined by Rule 1147(c)(6).

Near limit units are defined as equipment that are in compliance with existing Rule 1147 limits.

Three units identified with permit limits of 25 ppm must submit permit applications to reflect BARCT limit.

INITIAL BARCT NOx LIMIT
MICRO-TURBINES (NATURAL GAS)

 Proposed NOx Limit for Natural Gas Microturbines: 9 ppm
No additional cost since all units currently permitted or operating at or below proposed NOx limit.

Fuel Type | Existing Units | Rule 1147 Limit | Existing Permit Limits | BARCT Technology Review | Initial BARCT Limit
---|---|---|---|---|---
Natural Gas | Source Test Results | Units Meeting 9 ppm Limit | 6 of 6 RECLAIM | 30 ppm | 9 ppm
| 6 to 11 ppm Non-RECLAIM | 9 to 25 ppm | 9 ppm | 9 ppm

* Emissions data collected from source test results
* NOx concentrations are corrected to 15% O2 dry
* Three units identified with permit limits of 25 ppm must submit permit applications to reflect BARCT limit
ALL LIQUID FUEL UNITS (EXCEPT DISTILLATE FUEL MICROTURBINES)

- Units fired on liquid fuel are subject to a NOx limit of 40 ppm @ 3% O2
- Liquid fuel-fired units are generally found on portable combustion sources such as pressure washers and back up fuel for industrial boilers & steam generators
  - Liquid fueled boilers and steam generators are subject to Rule 1146 series
  - Liquid fuel pressure washers up to 550,000 btu/hr are exempt per Rule 219(b)(4)
  - Rule 219 exemption for diesel fuel heaters apply to units below 250,000 btu/hr under Rule 219(b)(3)

FURTHER EVALUATION OF RECLAIM DIESEL TAR POT

- Staff identified one diesel fueled tar pot in RECLAIM that would be subject to this category
  - Same unit operates under a non-RECLAIM various locations permit when operated at non-RECLAIM facilities owned by the same operator
  - No other liquid fuel-fired equipment subject to Rule 1147 in non-RECLAIM
- Identified unit is used to patch asphalt at a RECLAIM facility
- Unit is equipped with a diesel internal combustion engine rated <50 hp and a diesel fuel-fired thermal fluid heater rated at 420,000 btu/hr
  - Unit was never source tested
- Equipment usage logs show daily emissions of <1 lb/day
  - Operation logs are required to be kept under RECLAIM reporting
IMPLEMENTATION APPROACH
ALL LIQUID FUEL UNITS
(EXCEPT DISTILLATE FUEL MICROTURBINES)

All Liquid Fuel Units
(Except Distillate Fuel MicroTurbines)

1st Filter
Units At or
Below BARCT
Limit

2nd Filter
Low-Emitting*
or Near Limit*

Submit Application To
Comply with BARCT
When Unit Becomes 12
Years of Age

Cost-Effectiveness Analysis

Identified unit is expected to meet
definitions for low-emitting under
Rule 1147, no further action required
– no additional costs

*Low-emitting units are defined as equipment with NOx emissions of below 1 pound per day as determined by Rule 1147(c)(6)
*Near limit units are defined as equipment that are in compliance with existing Rule 1147 limits

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UPDATE STATUS SUMMARY OF BARCT ASSESSMENT

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Equipment Size</th>
<th>Operating Temperature</th>
<th>Current Rule Limit*</th>
<th>Initial BARCT Limit</th>
<th>Cost-Effectiveness</th>
<th>Proposed BARCT Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank</td>
<td>&lt;40 MMBtu/hr</td>
<td>&lt;1,200°F</td>
<td>30 ppm</td>
<td>20 ppm</td>
<td>$12,700/Ton</td>
<td>20 ppm</td>
</tr>
<tr>
<td></td>
<td>240 MMBtu/hr</td>
<td>≥1,200°F</td>
<td>60 ppm</td>
<td>30 ppm</td>
<td>$5,600/Ton</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator</td>
<td>All All</td>
<td>All</td>
<td>60 ppm</td>
<td>5 ppm</td>
<td>Pending</td>
<td>Pending</td>
</tr>
<tr>
<td>Evaporator, Fryer, Heated Process Tank, and Parts Washer</td>
<td>All All</td>
<td>All</td>
<td>60 ppm</td>
<td>5 ppm</td>
<td>Pending</td>
<td>Pending</td>
</tr>
<tr>
<td>Burn-off Furnace, Burnout Oven, Incinerator, Crematory with or without Integrated Afterburner</td>
<td>All All</td>
<td>All</td>
<td>60 ppm</td>
<td>5 ppm</td>
<td>Pending</td>
<td>Pending</td>
</tr>
<tr>
<td>Tenter Frame, Fabric or Carpet Dryer</td>
<td>All All</td>
<td>All</td>
<td>30 ppm</td>
<td>5 ppm</td>
<td>Pending</td>
<td>Pending</td>
</tr>
<tr>
<td>Other Unit and Process Temperature</td>
<td>All All</td>
<td>&lt;1,200°F</td>
<td>30 ppm</td>
<td>No Change</td>
<td>Pending</td>
<td></td>
</tr>
</tbody>
</table>

* NOx concentrations are corrected to 3% O₂, dry

Cost-Effectiveness Analysis

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35

36
### UPDATED STATUS SUMMARY OF BARCT ASSESSMENT (CONT’D)

#### Cost-Effectiveness Analysis

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

*NOx concentrations are corrected to 3% O<sub>2</sub>, dry

No additional liquid fuel equipment identified other than diesel tar pot and diesel microturbines <0.3 MW. Staff propose to maintain existing limits for “All Liquid Fuel-Fired Units.”

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### NEXT STEPS

- Conduct cost-effectiveness analysis for remaining categories
- Continue to hold stakeholder meetings
- Next Working Group Meeting – April 2021
## CONTACTS

<table>
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<tr>
<th>General RECLAIM Questions</th>
<th>Proposed Amended Rules 1147 and 1100</th>
<th>Proposed Rule 1147.1</th>
<th>Proposed Amended Rules 1147, 1100 and Proposed Rule 1147.2</th>
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