
PROPOSED AMENDED RULES 1146, 1146.1, 1146.2 & PROPOSED RULE 1100 WORKING GROUP #6

AUGUST 29, 2018
SCAQMD
DIAMOND BAR, CA

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Agenda

- Rule Applicability
- Staff recommendations
- Discussion of Preliminary Rule Language
 - PAR 1146, 1146.1 and 1146.2
 - PR 1100
- Schedule
- Contacts

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Rule 1146 Series

Rule	Applicability	Size
Rule 1146	Boilers, steam generators, and process heaters	≥ 5 million Btu per hour (MMBtu/hr)
Rule 1146.1	Boilers, steam generators, and process heaters	> 2 and < 5 MMBtu/hr
Rule 1146.2	Natural gas-fired water heaters, boilers, and process heaters	≤ 2 MMBtu/hr

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Rule Applicability

- Remove exemption for RECLAIM facilities
- Amendments to Rules 1146, 1146.1, and 1146.2 apply to RECLAIM and non-RECLAIM units
- Emission reduction requirements for RECLAIM facilities must be implemented regardless if the facility has exited RECLAIM
- Rule 1146 and 1146.1 equipment at the following facilities will not be included:
 - Electricity Generating Facilities (EGFs) under PAR 1135
 - Except for non-power producing boilers
 - Refineries under PAR 1109.1
 - As discussed in previous Working Group Meetings other industry categories will be included in Rule 1146 and 1146.1

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Rule Applicability (con't)

- ❑ Rule 1146.2 would apply to all RECLAIM units not covered in industry specific rules
 - If an industry specific rule contains an emission limit of R1146.2 units, R1146.2 requirements are exempt OR
 - If an industry specific rule contains no emission limit of R1146.2 units, R1146.2 requirements apply

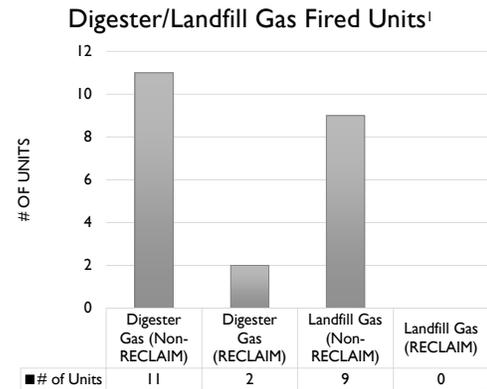
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Staff Recommendations – Previous Working Group Meeting

Group	Size (MMBtu/hr)	Recommended Emission Limit	Applicability	
			Units >5 ppm	Units ≤5 ppm
Rule 1146 Group I	≥75	5 ppm via SCR (same as existing limit)	Required to meet emission limit following compliance schedule	In compliance with rule limit
Rule 1146 Group II	≥20 to <75	For units > 12 ppm: 5 ppm via SCR For units ≤ 12 ppm: Fire-tube boilers: 7 ppm via ULNB Water-tube boilers: 9 ppm via ULNB	Required to meet emission limit following compliance schedule	Compliance at burner replacement (for both RECLAIM and non-RECLAIM)
Rule 1146 Group III	≥5 to <20	Fire-tube boilers: 7 ppm via ULNB Water-tube boilers: 9 ppm via ULNB		
Rule 1146.1	>2 to <5	Fire-tube boilers: 7 ppm via ULNB Water-tube boilers: 9 ppm via ULNB		
Atmospheric Units	≤10	12 ppm via ULNB (same as existing limit)		In compliance with rule limit
Thermal Fluid Heaters	NA	12 ppm via ULNB	Required to meet emission limit following compliance schedule (for both RECLAIM and non-RECLAIM)	Compliance at burner replacement (for both RECLAIM and non-RECLAIM) ⁶

Ongoing BARCT Assessment

- ❑ As part of 2008 rule amendments, units fired with digester and landfill gas were limited to 15 ppm and 25 ppm, respectively
 - Rule limits based on source test results pre-2008
 - Units were required to comply by January 1, 2015
- ❑ More stringent rule limits in San Joaquin Valley APCD (9-12 ppm) and Sacramento Metropolitan AQMD (15 ppm)
- ❑ BARCT assessment and cost analysis methods will follow similar approach as presented in previous working group meeting (#5)
- ❑ Staff recommendations will be included in the 75-day package



¹ Number of non-RECLAIM units obtained from 2008 rule revision staff report.

Proposed Amended Rules 1146

EMISSIONS OF OXIDES OF NITROGEN FROM INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS AND PROCESS HEATERS

PAR 1146 Subdivision (b) - Key Definitions

- **FIRE-TUBE BOILER** means any BOILER that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam.
- **FORMER RECLAIM FACILITY** means a facility that was in the Regional Clean Air Incentives Market, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.

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PAR 1146 Subdivision (b) - Key Definitions (con't)

- **NON-RECLAIM FACILITY** means a facility that is not and never was in the Regional Clean Air Incentives Market, as established in Regulation XX
- **MODIFICATION** means any physical change that meets the criteria set forth in Rule 1302 – Definitions
- **RECLAIM FACILITY** means a facility that is currently in the Regional Clean Air Incentives Market, as established in Regulation XX

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PAR 1146 Subdivision (c) - Rule Emission Limits

Table 1146-1

Rule Reference	Category	Limit (@ 3% O ₂)
(c)(1)(A)	All Units Fired on Gaseous Fuels	30 ppm or 0.036 lbs/10 ⁶ Btu (natural gas fired units)
(c)(1)(B)	Any Units Fired on Non-gaseous Fuels	40 ppm
(c)(1)(C)	Any Units Fired on Landfill Gas	25 ppm
(c)(1)(D)	Any Units Fired on Digester Gas	15 ppm
(c)(1)(E)	Atmospheric Units	12 ppm or 0.015 lbs/10 ⁶ Btu
(c)(1)(F)	Group I Units	5 ppm or 0.0062 lbs/10 ⁶ Btu
(c)(1)(G)	Group II Units (with an existing NO _x limit greater than 12 ppm)	5 ppm or 0.0062 lbs/10 ⁶ Btu
(c)(1)(H)	Group II Units (with an existing NO _x limit less than or equal to 12 ppm)	7 ppm or 0.0085 lbs/10 ⁶ Btu for fire-tube boilers only; 9 ppm or 0.011 lbs/10 ⁶ Btu for all others
(c)(1)(I)	Group III Units (Fire-tube Boilers Only)	7 ppm or 0.0085 lbs/10 ⁶ Btu
(c)(1)(J)	Group III Units (Excluding Fire-tube Boilers)	9 ppm or 0.011 lbs/10 ⁶ Btu
(c)(1)(K)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10 ⁶ Btu

- Limits reflect BARCT analysis presented during previous working group on August 2, 2018
- Extended the low use exemption specified in paragraph (c)(5) to RECLAIM units with annual heat input of ≤90,000 therms
 - Installed or modified prior to date of rule amendment
- Staff is evaluating emission limits for units fueled by landfill and digester gas

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PAR 1146 Subdivision (c) - Ammonia Slip Requirement

“(c)(2) - The owner or operator of any unit(s) operating with an air pollution control equipment that results in ammonia emissions in the exhaust shall not discharge into the atmosphere ammonia emissions in excess of 5 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes).”

- Recently permitted units are already required to meet 5 ppm NH₃
- For units installed or modified prior to date of rule amendment with a permit limit >5 ppm NH₃, compliance is when air pollution control equipment is replaced or modified

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PAR 1146 Subdivision (c) – Compliance for Units Near Final Emission Limit

- For units near final emission limit, not cost-effective to require immediate retrofit
- Existing provisions allow non-RECLAIM Group III units with permit limit of ≤ 12 ppm to meet emission limit at burner replacement
- Must demonstrate compliance to rule limits during burner replacement or 15 years from date of rule amendment, whichever occurs earlier
 - For units with more than one burner, replacement means when $\geq 50\%$ of unit's burners are replaced

Equipment Type	Permit Limit (@ 3% O ₂)	Compliance Schedule
Rule 1146 Group III (≥ 5 to < 20 MMBtu/hr)	≤ 12 ppm	Upon burner replacement or 15 years from date of rule amendment
Rule 1146 Group II (≥ 20 to < 75 MMBtu/hr)	≤ 9 ppm	Upon burner replacement or 15 years from date of rule amendment
Thermal Fluid Heaters	≤ 20 ppm	Upon burner replacement or 15 years from date of rule amendment
Ammonia Slip	> 5 ppm	Modification or replacement of emission control equipment ¹³

PAR 1146 Paragraph (c)(6) - Continuous Emissions Monitoring System (CEMS)

Criteria	Rule 1146	RECLAIM Rule 2012
Size	40 MMBtu/hr	40 MMBtu/hr
Heat Input	200 Billion Btu per year	90 Billion Btu per year

- Current CEMS threshold for Rule 1146 is higher than that of RECLAIM
- Changing from RECLAIM CEMS threshold to Rule 1146 CEMS threshold would not be considered backsliding
- Non-Title V RECLAIM facilities that do not exceed criteria in Rule 1146 can choose to remove CEMS
 - Must commit to annual heat input of < 200 Billion Btu per year
 - Permit condition to limit fuel usage
 - Equipment size must remain < 40 MMBtu/hr

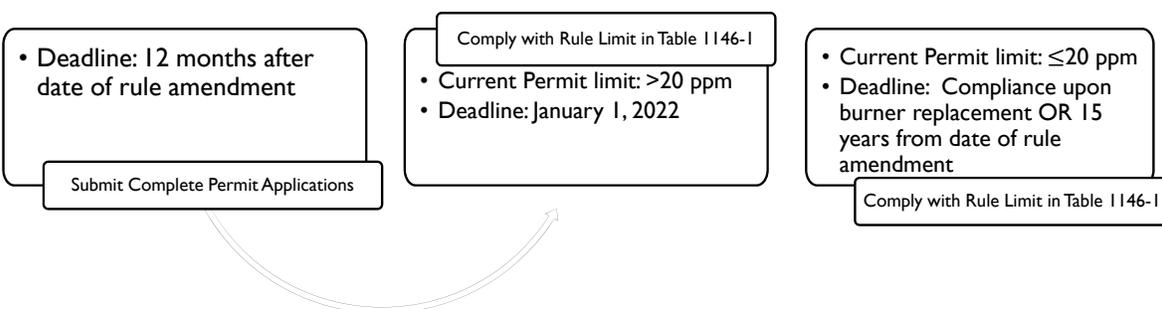
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PAR 1146 Subdivision (d) - Monitoring, Reporting and Recordkeeping

- ❑ Schedule of RECLAIM MRR transition is addressed in PR 1100
- ❑ For units with SCR, annual ammonia slip source test requirement for both RECLAIM and non-RECLAIM units
 - Already required in new or modified equipment permits
 - Must demonstrate compliance within 12 months of unit operation, and annually within 12 months thereafter

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PAR 1146 Paragraph (e)(2) – Thermal Fluid Heater Compliance Schedule*



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*Except for units at a RECLAIM or former RECLAIM facility subject to the schedule specified in Rule 1100

PAR 1146 Subdivision (f) - Exemptions

- New subdivision added to address exemptions previously mentioned in subdivision (a) - Applicability

“The provisions of this rule shall not apply to:

- 1. boilers used by electric utilities to generate electricity; and***
- 2. boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; and***
- 3. sulfur plant reaction boilers; and***
- 4. any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.”***

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Proposed Amended Rules 1146.1

EMISSIONS OF OXIDES OF NITROGEN FROM INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS AND PROCESS HEATERS

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PAR 1146.1 Subdivision (c) - Rule Emission Limits

Table 1146.1-1

Rule Reference	Category	Limit (@ 3% O ₂)
(c)(1)(A)	All Other Units	30 ppm or 0.036 lbs/10 ⁶ Btu (natural gas fired units)
(c)(1)(B)	Any Units Fired on Landfill Gas	25 ppm
(c)(1)(C)	Any Units Fired on Digester Gas	15 ppm
(c)(1)(D)	Atmospheric Units	12 ppm or 0.015 lbs/10 ⁶ Btu
(c)(1)(E)	Any Units Fired on Natural Gas, Excluding Fire-tube boilers, Atmospheric Units, and Thermal Fluid Heaters	9 ppm or 0.011 lbs/10 ⁶ Btu
(c)(1)(F)	Any fire-tube Boilers Fired on Natural Gas	7 ppm or 0.0085 lbs/10 ⁶ Btu
(c)(1)(G)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10 ⁶ Btu

- ❑ Limits reflect BARCT analysis presented during previous working group on August 2, 2018
- ❑ Extended the low use exemption specified in paragraph (c)(5) to RECLAIM units with annual heat input of $\leq 18,000$ therms
 - Installed or modified prior to date of rule amendment
- ❑ Staff is evaluating emission limits for units fueled by landfill and digester gas

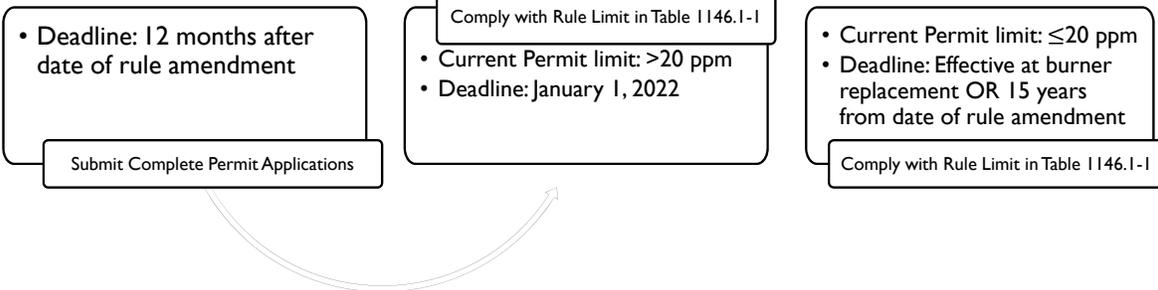
PAR 1146.1 Subdivision (c) – Compliance for Units Near Final Emission Limit

- ❑ Not cost-effective to require immediate retrofit for units near final emission limit
- ❑ Existing provisions allow non-RECLAIM units with permit limit of ≤ 12 ppm to meet emission limit at burner replacement
- ❑ Must demonstrate compliance to rule limits during burner replacement or 15 years from date of rule amendment
 - For units with more than one burner, replacement means when $\geq 50\%$ of unit's burners are replaced

Equipment Type	Permit Limit (@ 3% O ₂)	Compliance Schedule
Rule 1146.1 (>2 to <5 MMBtu/hr)	≤ 12 ppm	Upon burner replacement or 15 years from date of rule amendment
Thermal Fluid Heaters	≤ 20 ppm	Upon burner replacement or 15 years from date of rule amendment

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PAR 1146.1 Paragraph (e)(2) – Thermal Fluid Heater Compliance Schedule*



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*Except for units at a RECLAIM or former RECLAIM facility subject to the schedule specified in Rule 1100

PAR 1146.1 Subdivision (f) - Exemptions

- New subdivision added for RECLAIM and former RECLAIM facilities subject to PR 1100 previously mentioned in subdivision (a) - Applicability

“The provisions of this rule shall not apply to any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.”

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Proposed Amended Rule 1146.2

EMISSIONS OF OXIDES OF NITROGEN FROM LARGE WATER HEATERS AND SMALL BOILERS AND PROCESS HEATERS

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Proposed Amended Rule 1146.2

- No changes to NOx concentration limit at this time, will revisit later (post transition)
- Include commitment to conduct a technology assessment by January 1, 2022
 - If BARCT is the same as existing rule requirements (30 ppm), compliance by December 31, 2023
 - If BARCT is less than 30 ppm, a new compliance schedule will be developed
- Any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category is exempt from Rule 1146.2

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Proposed Rule 1100

IMPLEMENTATION SCHEDULE FOR NOX FACILITIES

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PR 1100 Subdivision (b) – Applicability

- RECLAIM or former RECLAIM facilities that own or operate equipment that meets the applicability provisions specified in:
 - 1) Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; or
 - 2) Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters.
- Rule applicability will updated in the future to reflect amendments to other command-and-control landing rules

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PR 1100 Subdivision (c) - Key Definitions

- **INDUSTRY-SPECIFIC CATEGORY** means a RECLAIM or former RECLAIM facility that consists of refineries or electricity generating facilities.
- **RULE 1146 UNIT** means any boiler, steam generator, water heater, or process heater as defined in Rule 1146 paragraph (b)(5) or (b)(21) with a rated heat input capacity that is equal to or greater than 5 million Btu per hour, excluding units specified in Rule 1146 subdivision (f).

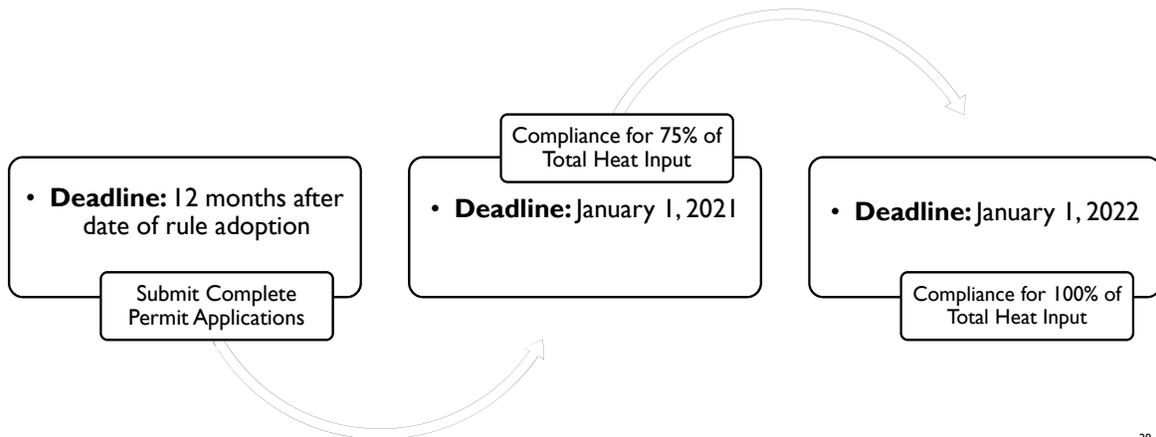
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PR 1100 Subdivision (c) - Key Definitions (con't)

- **RULE 1146.1 UNIT** means any boiler, steam generator, or process heater as defined in Rule 1146.1 paragraph (b)(4) or (b)(16) with a rated heat input capacity that is greater than 2 million Btu per hour and less than 5 million Btu per hour, excluding units specified in Rule 1146.1 subdivision (f).
- **TITLE V FACILITY** means any facility that meets the criteria set forth in Rule 3001 - Applicability

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PR 1100 Subdivision (d)* - Rule 1146 and Rule 1146.1 Implementation Schedule



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**Any unit at a RECLAIM or former RECLAIM facility that is subject to a NO_x emission limit in a different rule for an industry-specific category is not subject to the requirements contained in this subdivision.*

PR 1100 Subdivision (d)* - Rule 1146 and Rule 1146.1 Implementation Schedule (con't)

- Facility that elects to replace existing applicable equipment (instead of burner replacement or retrofitting) can use the replacement unit to meet total heat input percentage requirement if:
 - Facility notifies Executive Officer in writing which unit will be replaced on or before 12 months from rule adoption date
 - Need to include:
 - ✓ Facility name
 - ✓ Facility ID number
 - ✓ Permit number(s) of unit(s) being replaced
 - ✓ Size of existing and new units
- Heat input capacity of replacement unit must not exceed existing unit
- Owner or operator must replace existing unit(s) on or before January 1, 2023.

**Any unit at a RECLAIM or former RECLAIM facility that is subject to a NO_x emission limit in a different rule for an industry-specific category is not subject to the requirements contained in this subdivision.*

PR 1100 Subdivision (d)* - Rule 1146 and Rule 1146.1 Compliance for Units Near Final Emission Limit

- Rule limits effective at burner replacement for equipment located in RECLAIM facilities for NOx granted that:
 - Unit was installed or modified prior to date of rule adoption
 - Permit limit of ≤ 12 ppm for Rule 1146 Group II & III units and natural gas fired Rule 1146.1 units (excl. thermal fluid heaters)
 - Permit limit of ≤ 20 ppm for thermal fluid heaters
- Compliance with Rule 1146 and 1146.1 limits at replacement of 50% or more of the unit's burners OR 15 years from date of rule adoption, whichever occurs earlier

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*Any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category is not subject to the requirements contained in this subdivision.

Monitoring, Reporting and Recordkeeping – PR 1100 Subdivision (e)

- Title V RECLAIM facilities shall comply with MRR specified in Rule 2012
- Non-Title V RECLAIM facilities shall comply with the monitoring, reporting, and recordkeeping requirements in the applicable rule(s) when the facility the earlier of:
 - Achieves BARCT for all of its equipment, OR
 - Exits RECLAIM

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Updated Schedule

- | | |
|-----------------|-----------------------------|
| ☐ Sept 20, 2018 | Public Workshop |
| ☐ Oct 4, 2018 | End of Comment Period |
| ☐ Oct 19, 2018 | Stationary Source Committee |
| ☐ Nov 2, 2018 | Set Hearing |
| ☐ Dec 7, 2018 | Public Hearing |

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Contacts

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