

COMMENT AND RESPONSE DOCUMENT

Prepared Pursuant to Section 4-168(e) of the Connecticut General Statutes and Section 22a-3a-3(d) of the Department of Energy and Environmental Protection Rules of Practice

Regarding Adoption of Air Quality Regulations Concerning Nitrogen Oxides (NOx) emissions

**Hearing Officers:
Wendy Jacobs and Merrily Gere**

Date of Hearing: June 8, 2016

On May 3, 2016, the Commissioner of the Department of Energy and Environmental Protection (DEEP) published a notice of intent to adopt sections 22a-174-22e and 22a-174-22f, repeal section 22a-174-22 and amend various sections of the Regulations of Connecticut State Agencies (RCSA) that refer to RCSA section 22a-174-22. Pursuant to such notice, a public hearing was held on June 8, 2016, with the public comment period closing at 5 PM on June 8, 2016.

I. Comment and Response Document Content

As required by section 4-168(e) of the Connecticut General Statutes (CGS), this document describes the proposal, identifies principal reasons in support of and in opposition to the proposal, and summarizes and responds to all comments on the proposal.

II. Summary of Proposal

The Commissioner is proposing to adopt RCSA sections 22a-174-22e and 22a-174-22f, repeal section 22a-174-22 and amend various sections of the air pollution regulations that refer to section 22a-174-22 (RCSA sections 22a-174-3b, 22a-174-18, 22a-174-33 and 22a-174-42). The proposal includes the following:

- Proposed RCSA section 22a-174-22e and 22a-174-22f will together replace current RCSA section 22a-174-22. RCSA section 22a-174-22e applies to major sources of NOx and requires the owners and operators of regulated boilers, turbines and engines to meet more stringent NOx emissions limits, which are consistent with similar NOx emissions limits now required in other states, such as New York and New Jersey;
- The repeal of RCSA section 22a-174-22 and proposal of RCSA section 22a-174-22e phases out a state-only NOx emissions trading program that is no longer necessary given advances in emissions control technology and reductions in the costs of such control technology; and
- Proposed RCSA section 22a-174-22f will require owners of NOx emitting equipment at non-major sources of NOx to track daily emissions during the ozone season, and take

steps to reduce NO_x emissions if an emissions unit exceeds a certain level of NO_x emissions. Owners of emission units that maintain low daily NO_x emission levels will continue to operate under RCSA section 22a-174-22f and have fewer compliance responsibilities than owners of equipment at major sources of NO_x.

The motivation behind developing and seeking to adopt this proposal now is to satisfy, in part, DEEP's obligations to require all of Connecticut's major sources of NO_x to be controlled to a level termed "reasonably available control technology" or RACT for the 8-hour ozone national ambient air quality standard (NAAQS). In July 2014, DEEP submitted a State Implementation Plan (SIP)¹ to EPA describing DEEP's RACT review and analysis under the 2008 ozone NAAQS and committing to revise certain regulations, including RCSA section 22a-174-22. Proposed RCSA section 22a-174-22f maintains the daily ozone season NO_x emission limits in RCSA section 22a-174-22 to satisfy the antibacksliding provisions of Clean Air Act (CAA) Section 110(l) and address high electric demand day emissions.

III. Opposition to the Proposal

The majority of submitted comments focused on specific provisions of the proposal and recommended revisions to clarify or better achieve the intended result of the provision. DEEP is appreciative of such constructive comment and the resulting modifications to the proposal. Comments submitted by NRG Energy, Inc. were those that raised opposition to the proposal, predicting limited air quality benefit as a result of the adoption of the proposal and fiscal harm to Connecticut residents. DEEP strongly disagrees with NRG's assumptions and assessments. DEEP is also disappointed that NRG seems to have a limited understanding of the proposal, despite NRG's participation in the proposal's development.

All comments submitted on the proposal are set out in the next section of this report, along with DEEP's responses thereto.

IV. Summary of Comments

Written comments were received from the following persons:

1. Ronald Schroeder
(no contact information or organizational association provided)
2. Raymond Yarmac
(no contact information or organizational association provided)
3. Eugene (Skip) Brackbill
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¹ Available at http://www.ct.gov/deep/cwp/view.asp?a=2684&q=546804&deepNav_GID=1619

4. Eric Brown
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Oral comments were received from the following persons:

1. Robert Silvestri
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2. Christopher Shepard
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All comments submitted are summarized below with DEEP's responses. When changes to the proposed text are indicated in response to comment, new text is in bold font and deleted text is in strikethrough font.

Written Comment 1, Ronald Schroeder

Proposed RCSA section 22a-174-22e would require annual tune-ups for affected emission units including combustion turbines. "Tune-up" means adjustments made to an emission unit to improve efficiency with respect to combustion operations. The owner or operator of an emission unit subject to this section would be required to conduct an inspection and tune-up of each affected combustion turbine once per calendar year beginning in 2018, with each subsequent annual tune-up performed no earlier than 180 days after the previous tune-up. The inspections and tune-ups must be conducted according to the manufacturer's recommended procedures, or, if the manufacturer's recommendations are no longer available, according to best available practices. Combustion turbines affected by federal regulations (e.g. New Source Performance Standards (NSPS) including 40 CFR 60 Subpart KKKK for combustion turbines) would be required to conduct periodic tune-ups according to schedules and procedures prescribed by the federal regulations. Tune-ups would be required at least every 60 months if the period between tune-ups in the applicable federal regulations is longer than annual.

Tune-ups, as traditionally understood, apply more specifically to boiler and reciprocating engine units than to combustion turbines. Periodic maintenance, inspection and possible adjustment of turbine combustion systems do not involve, for example, adjusting combustion timing, spark plugs or carburetors. Combustion turbine operators adhere to stringent written periodic maintenance, inspection, adjustment and testing procedures. 40 CFR 60 Subpart KKKK and DEEP air permits require annual or biennial testing of nitrogen oxide (NOx) emissions to document compliance with emission limits.

The requirement to perform annual "tune-ups", involving adjustments to improve combustion efficiency, should be clarified in the proposed regulation with respect to combustion turbines. Specifically, the commenter proposes the following regulatory text changes to achieve this clarification. Additions are shown underlined, and deletions are shown ~~crossed through~~.

22a-174-22e(a)(31): “Tune-up” means maintenance, inspection and/or adjustments made to an emission unit to maintain or improve efficiency with respect to combustion operations.

22a-174-22e(i)(2): “The owner or operator of an emission unit that is subject to 40 CFR 60 or 40 CFR 63 and required to conduct a periodic tune-up or performance test by the applicable requirements of 40 CFR 60 or 40 CFR 63 may conduct tune-ups or performance testing according to the schedule and procedures of the applicable requirements of 40 CFR 60 or 40 CFR 63. If tune-ups are not required by 40 CFR 60 or 40 CFR 63, then maintenance and inspection of the emission unit shall be conducted according to the manufacturer’s recommended procedures, or, if the manufacturer’s recommendations are no longer available, according to best available practices. If the period between tune-ups in the applicable requirements of 40 CFR 60 or 40 CFR 63 is greater than 60 months, a tune-up shall be conducted at least once every 60 months.”

DEEP’s Response to Written Comment 1, Ronald Schroeder

DEEP agrees with the commenter that the proposed tune-up requirements should not be applied to turbines. The final proposal resulting from this Comment and Response document will limit the tune-up provision to boilers and engines. A more detailed discussion is provided in response to **Written Comment 8, CBIA.**

Written Comment 2, Ronald Schroeder

Proposed RCSA section 22a-174-22f would require owners or operators of affected non-emergency engine emission units, including combustion turbines, to make and keep records of daily NOx emissions during the ozone season. These calculations and records would have to be completed no later than the second day of each month for the preceding month.

The requirement to prepare calculations and records by the second day following each month of the ozone season is unreasonably burdensome and could make compliance extremely difficult. Typically, federal and State regulations and permits require records to be completed by the 30th day of the following month. The proposed regulation should be revised so that owners and operators have sufficient time to collect and record operating data, perform daily NOx emission calculations and compile daily emissions for the preceding ozone season month. Specifically, the commenter proposes the following regulatory text changes to achieve this improvement. Additions are shown underlined, and deletions are shown ~~erossed through~~.

22a-174-22f(g)(2): “The owner or operator of an emission unit that is not an emergency engine shall make and keep the following records on and after May 1, 2018:

- (A) During the period from May 1 to September 30, inclusive, records sufficient to determine the NOx emissions (lbs) per day;
- (B) A calculation of NOx emissions on each day of operation, performed no later than the ~~second~~ thirtieth day of each month for every day of operation in the preceding month;”

DEEP's Response to Written Comment 2, Ronald Schroeder

DEEP agrees with the commenter that the requirement to prepare calculations and records by the second day following each month of the ozone season is unreasonably burdensome. DEEP's current New Source Review permit templates for combustion units (boilers, engines and turbines) all require monthly and consecutive 12-month records to be calculated and recorded within 30 days of the end of the previous month. The new General Permit to Limit Potential to Emit allows for up to 45 days to calculate and record monthly/consecutive 12-month records. To be consistent with current DEEP practice, DEEP should revise RCSA section 22a-174-22f(g)(2)(B) of the final proposal as follows:

- (B) A calculation of NO_x emissions on each day of operation, performed no later than the ~~second~~ last day of each month for every day of operation in the preceding month;

Written Comment 3, Raymond Yarmac

Consideration should be given to revising 22a-174-22f(e) to exempt non-emergency engines that exceed the daily emission levels in (e)(2) because of an emergency from having to comply with the emission limits in 22a-174-22e. There are many non-emergency engines in Connecticut that were primarily installed to serve as backup power for emergencies. An emergency such as a hurricane or fire could easily cause the engines to exceed the 22e emission limits.

DEEP's Response to Written Comment 3, Raymond Yarmac

The final proposal should not be revised in response to this comment because such a change blurs the distinction between emergency and non-emergency engines and will have a negative impact on air quality. DEEP has carefully preserved these distinctions over time and makes changes to the definition of "emergency engine" in this proposal only after careful consideration. A situation that meets one of the criteria for an "emergency" as defined in the proposal would be a period of time during which an emergency engine may operate without limitation under RCSA section 22a-174-22f. Generally, the periods of time that constitute defined emergencies are limited, so the air quality impact of the operation of such engines is limited and the owners are excused from operating pollution controls. However, an engine that operates for periods of time other than those defined as emergencies should have NO_x controls to limit emissions of regulated air pollutants.

Written Comment 4, Eugene A. Brackbill

Recommend that "combined heat and power" be inserted and/or added before "combined cycle turbine" at the following locations in proposed RCSA section 22a-174-22e: (a)(9), (b)(C), (d)(5)(A), (d)(5)(B), (d)(5)(C), (d)(5)(D), (d)(9)(C)(new insert), (d)(15), (d)(18) (delete reference to CHP being subject to (d)(5) CCT limits), (g)(5), (g)(5)(B), (g)(5)(C), (g)(5)(C)(i), and (g)(5)(C)(ii). (Mr. Brackbill included a marked regulation with his comments.)

Despite the declaration in subsection (d)(18) that CHP are subject to CCT limits, it should almost be stated in the converse. The largest number of stationary gas turbines in Connecticut are believed to be in CHP service. There may be some peaking units that operate as CCT. The University of Connecticut Storrs Campus Energy operates a CCT. The regulation can be made unambiguous to the larger CHP population by simply inserting "combined heat and power"

before “combined cycle turbine”. Seemingly a simple matter of engineering semantics, the commenter believes it is appropriate to reflect the stationary gas turbine population.

DEEP’s Response to Written Comment 4, Eugene A. Brackbill

DEEP agrees with the correctness from an engineering perspective of the comment and appreciates Mr. Brackbill’s desire for a revision to the text for this reason. However, DEEP is declining to make the suggested change in the final proposal because it does not make the text of the proposal or the definitions clearer.

Written Comment 5, CBIA

Comments on §22a-174-22e(c)(5)(E): Tier 4 Emergency Engine Exemption

As written, RCSA section 22a-174-22e(c)(5)(E) exempts emergency engines that meet Tier 4 NOx emission standards of 40 CFR 1039, Subpart B for model year 2013 or later, from the prohibition in subsection (d)(14) to operate for testing on a day with forecast ozone levels “moderate to unhealthy for sensitive groups” or greater.

CBIA supports the rule exemptions listed in this subsection, and requests a minor clarification to the regulatory language to include engines that meet *interim* Tier 4 NOx emission standards under this exemption. CBIA proposes modifying § 22a-174-22e(c)(5)(E) as follows:

(E) If an owner or operator operates an emergency engine in compliance with the ~~Tier 4~~ NOx emissions standards of 40 CFR 1039, Subpart B for model year 2013 or later, such engine is exempt from the restriction of subsection (d)(14) of this section.

DEEP’s Response to Written Comment 5, CBIA

The proposal should be revised with the deletion recommended by CBIA. The inclusion of engines that comply with the interim standards for model year 2013 is consistent with the intent of the exemption provided in proposed RCSA section 22a-174-22e(c)(5)(E) and may help to avoid future misinterpretations.

Written Comment 6, CBIA

Comment on §22a-174-22e(g)(3)(F): Compliance Options

RCSA section 22a-174-22e(g)(3)(F) was added to the proposed regulation as a compliance option at the request of stakeholders for several reasons. Principally, it recognizes that many dual fuel fired boilers are intended to run primarily on natural gas while maintaining oil burning as an option.

This gives sources the added security of having two different types of fuel available to supply heating and useful steam. Also, this enables sources to leverage the advantage of “interruptible” natural gas fuel pricing and receive a lower rate by contractually agreeing to switch to oil burning when the fuel supplier needs to reduce natural gas demand in the region. These interruptions have historically been brief and almost exclusively taken place during the coldest days of the year -- well outside the ozone season.

The Federal “Boiler MACT” regulations cited in this subsection requires boilers to only use oil during these interruptions or for a maximum of 48 additional hours per year to allow for maintenance, tuning and testing. DEEP is able to rely upon these federally enforceable rules to limit these dual fuel fired boilers making it unnecessary to write additional State rules and/or

permits or orders to achieve these restrictions. The federal rules recognize and treat these boilers as natural gas “only” units that are not subject to oil fired federal MACT rules.

Based upon stakeholder meetings with DEEP, the commenter understands the intention of this subsection is to treat these dual fired units as natural gas “only” units for the purposes of Section 22e(d) emission limits. The wording of this subsection currently could be read to mean that these dual fired boilers must comply with subsection (d) when burning gas and comply with subsection (d) when burning oil. This would make the entire subsection (g)(3)(F) meaningless and of no use to any regulated facility. CBIA proposes the following changes to clarify that these dual fired units need only to comply with RCSA section 22a-174-22e when firing natural gas.

(F) For an ICI boiler subject to 40 CFR 63, Subpart DDDDD, operate as a “unit designed to burn gas 1 subcategory”, as defined in 40 CFR 63.7575 or, for an ICI boiler subject to 40 CFR 63, Subpart JJJJJ, operate as a “gas-fired boiler”, as defined in 40 CFR 63.11237. This option is only available if operation on gas results in quantifiable annual NOx emissions equal to or less than the NOx emissions expected if the ICI boiler operated in compliance with the applicable emissions limitations of subsection (d) of this section by combusting ~~[residual oil or other oil and]~~ gas. These units are not subject to emissions limitations of subsection (d) of this section when combusting residual or other oil; or

It may be that DEEP’s intention is that when combusting gas that these units meet all three of the subsection (d) fuel standards. However, in all cases the emission limitations for gas are more stringent than for residual or other oil so this language is unnecessary and will only lead to confusion.

Written Comment 7, CBIA

Comment on § 22a-174-22e(g): Compliance Options

As a compliance option to meeting the phased emission limits in 22a-174-22e(d), proposed § 22a-174-22e(g)(3)(F) allows the owner or operator of an ICI boiler subject to 40 CFR 63, Subpart DDDDD to operate as a “unit designed to burn gas 1 subcategory”, as defined in 40 CFR 63.7575. The proposed rule states that this option is only available if operation on gas results in quantifiable annual NOx emissions equal to or less than the NOx emissions expected if the ICI boiler operated in compliance with the applicable emissions limitations of subsection (d) of this section by combusting residual oil or other oil and gas.

The commenter understands from DEEP staff that this compliance option is intended for emission units that switched to gas or limited oil operations in order to meet the definition of “unit designed to burn gas 1 subcategory” in 40 CFR 63, Subpart DDDDD. DEEP staff stated that if the switch occurred prior to the promulgation of the “unit designed to burn gas 1 subcategory” definition in 40 CFR 63, Subpart DDDDD, this compliance option cannot be used. It was further stated the intent of this compliance option is that the “emissions from the unit operating on gas be less than the proposed limits for the unit operating on the fuel it switched from.”

DEEP used an analogy of the baseline emissions in the NOx emission trading program: if an emission unit switched to burning gas several years prior to the implementation of the emissions

trading program, the gas emission rate would be the baseline emission rate, and not the prior fuel rate.

CBIA strongly disagrees with this interpretation and advocates that the baseline emission rate be based on the current limits in the NO_x rule, and not on the timing of the promulgation of Subpart DDDDD. The current NO_x RACT emission limits and the emissions trading program have been a compliance option in Section 22a-174-22 since 1995. In the NO_x rule (hearing report dated April 29, 1994), NO_x limits after May 31, 1995 for Other Boilers were established as 0.2 lb NO_x/MMBtu for gas, 0.25 lb NO_x/MMBtu for residual oil, and 0.2 lb NO_x/MMBtu for other oil. Emission reduction trading was introduced in this rule at that time and, aside from minor revisions to the NO_x rule 22a-174-22 since 1994, the May 2016 proposed amendment is the first to create more stringent emission limits.

One CBIA member, and perhaps others, operates a boiler that meets the Phase 1 limit of 0.2 lb NO_x/MMBtu, but does not meet the Phase 2 limit of 0.05 lb NO_x/MMBtu in the proposed rule. In 1995 and before, the boiler burned No. 6 oil, and used NO_x DERCs under the trading program. The boiler burned only gas after 1995. For purposes of Sec. 22a-174-22e, the baseline NO_x emissions for this boiler should be those from burning No. 6 oil and the compliance option to burn gas only should be made available, as there is a distinct decrease in NO_x emissions from the baseline. If this compliance option is not available, CBIA members may be forced to install multi-million dollar NO_x controls to meet 0.05 lb/MMBtu by 2022, rather than defer those costs until 2028.

DEEP's Response to Written Comments 6 and 7, CBIA

DEEP agrees with the CBIA that the compliance option for ICI boilers provided in subsection (g)(3)(F) requires clarification to match DEEP's intent in providing that compliance option. The compliance option is intended to allow dual-fuel ICI boilers to operate only on gas, with the exception of a limited number of hours of operation on oil to address testing or maintenance or to allow continued operation for a curtailment or supply interruption of gas. The option recognizes that NO_x emissions are considerably reduced when a dual-fueled boiler operates primarily on gas. Because EPA's boiler NESHAPs provide restrictions on operation of such boilers on oil, use of the compliance option requires operation of the ICI boiler under the appropriate provisions of either the major or area source boiler NESHAP to limit operation on oil.

DEEP agrees that the compliance option should require the owner of an ICI boiler that operates primarily on gas under the major or area source boiler NESHAP to comply with only the Phase 1 emission limitation for operation on gas. DEEP has considered the emissions that will be reduced by requiring compliance with the Phase 2 emission limitation for operation on gas compared to continued compliance with the Phase 1 emission limitation and finds the difference to be acceptable under the RACT standard given the cost for the owners and operators of such boilers to further control the boilers to comply with the Phase 2 limitation for operation on gas and the overall NO_x emissions reductions achieved by RCSA section 22a-174-22e.

Because the compliance options of subsection (g) sunset on May 31, 2028, the result is that the compliance option effectively provides an extension of time to owners and operators of dual-fuel ICI boilers to control or replace the boiler to comply with the Phase 2 limitation for operation on gas.

Proposed subsection (g)(3)(F) should be deleted and replaced with the following in the final text of the proposal:

~~(F) — For an ICI boiler subject to 40 CFR 63, Subpart DDDDD, operate as a “unit designed to burn gas 1 subcategory”, as defined in 40 CFR 63.7575 or, for an ICI boiler subject to 40 CFR 63, Subpart JJJJJ, operate as a “gas-fired boiler”, as defined in 40 CFR 63.11237. This option is only available if operation on gas results in quantifiable annual NO_x emissions equal to or less than the NO_x emissions expected if the ICI boiler operated in compliance with the applicable emissions limitations of subsection (d) of this section by combusting residual oil or other oil and gas; or~~

(F) To satisfy the Phase 1 and Phase 2 emissions limitations of subsection (d)(3) of this section:

- (i) Operate an ICI boiler subject to 40 CFR 63, Subpart DDDDD, as a “unit designed to burn gas 1 subcategory,” as defined in 40 CFR 63.7575, and comply with the emissions limitation of subsection (d)(3)(A) of this section for operation on gas, or**
- (ii) Operate an ICI boiler subject to 40 CFR 63 Subpart JJJJJ, as a “gas-fired boiler,” as defined in 40 CFR 63.11237, and comply with the emissions limitation of subsection (d)(3)(A) of this section for operation on gas; or**

Written Comment 8, CBIA

Comments on § 22a-174-22e(i): Tune-Ups

The proposed rule has added an annual tune-up requirement beginning in 2018 for equipment that meets the rule’s applicability criteria. CBIA members commonly have the following equipment subject to the proposed new tune-up requirements: emergency reciprocating engines, industrial boilers, and/or combined heat and power (CHP) systems. Emergency engines are exempt from the tune-up requirement, per § 22a-174-22e(c)(5)(B) and industrial boilers may use the periodic tune-up required by an applicable requirement of 40 CFR 60 or 40 CFR 63 to comply, as long as it is performed at least once every 60 months.

For turbines (part of a CHP), a tune-up is problematic and not routinely conducted in the industry. First, it should be noted that turbines are constructed and operate very differently from a reciprocating engine or boiler. Unlike turbines, reciprocating engine and boiler parts wear or corrode, carbon builds up in nozzles, spark plugs and belts need cleaning and replacement, timing needs adjustment. In addition, the tune-up for a boiler involves air to fuel ratio adjustment. This is not the case for turbines. Second, it should be noted that there are no comparable tune-up requirements in the 40 CFR Part 60 or 40 CFR Part 63 regulations that apply to turbines. Lastly, there is no tune-up prescribed by the turbine manufacturer in the O&M manual - only regular maintenance, such as cleaning. This was corroborated by Ms. Leslie Witherspoon, Manager, Environmental Programs, of Solar Turbines.

As a remedy, CBIA requests to exempt combustion turbines from the tune-up requirement, similar to the tune-up exemption for emergency engines in § 22a-174-22e(c)(5)(B). Specifically, CBIA recommends the following language be added to this subsection:

“Any CHP owner or operator shall comply with any manufacturer-recommended maintenance procedures or industry standards that have the effect of reducing NOx emissions from these.”

DEEP’s Response to Written Comment 8, CBIA

The tune-up requirements of the final version of RCSA section 22a-174-22e should be revised to apply only to ICI boilers and reciprocating engines, as recommended by CBIA and **Written Comment 1, Ronald Schroeder**. The reason for the tune-up provisions is the NOx emissions benefit associated with a well-maintained and tuned emission unit, which is documented for boilers and reciprocating engines.

Subsection (i)(1) of proposed RCSA section 22a-174-22e should be revised as follows:

- (1) Except as provided in subdivision (2) of this subsection, the owner or operator of an ~~emission unit~~ **ICI boiler or reciprocating engine** subject to this section shall conduct an inspection and tune-up of the emission unit a minimum of once per calendar year beginning with year 2018. Each subsequent annual tune-up

As similar language is proposed in subsection (f) of RCSA section 22a-174-22f, subsection (f)(1) of that section should also be revised as follows:

- (1) Except as provided in subdivision (2) of this subsection, the owner or operator of an ~~emission unit~~ **ICI boiler or reciprocating engine** subject to this section that is not an emergency engine shall

Written Comment 9, CBIA

Comments on §§ 22a-174-22e(j)(1) & (2): Recordkeeping

Although it may be understood, it appears that two references to *an emission unit* in §§ 22a-174-22e(j)(1) & (2) were meant to say **an emission unit subject to this section**. The way the two proposed sentences read, this record keeping requirement would apply to every emission unit at a facility. This clarification (i.e., subject to this section) appears in approximately two dozen other locations throughout this proposed rule. There is an analogous recordkeeping requirement in 22a-174-22f(g)(1) that includes the expected **subject to this section** language. CBIA proposes modifying § 22a-174-22e(j) as follows:

- (1) The owner or operator of an emission unit **subject to this section** shall retain all records and reports produced pursuant to this section for five years. Such records and reports shall be available for inspection at reasonable hours by the commissioner or the Administrator. Such records and reports shall be retained at the premises, unless the commissioner approves in writing the use of another location in Connecticut.
- (2) The owner or operator of an emission unit **subject to this section** shall make and keep the following records on and after May 1, 2018:

DEEP’s Response to Written Comment 9, CBIA

Although DEEP does not agree that clarification is necessary given the restriction on subsection (j)(1) to “records and reports produced pursuant to this section,” DEEP is willing to add the

requested phrase if it will assist the regulated community to comply with the proposal. The final version of RCSA section 22a-174-22e should include the additional phrase in subdivisions (1) and (2) of subsection (j) as recommended in CBIA's comment.

Written Comment 10, CBIA

Comments on §22a-174-22e(j)(2)(D): Recordkeeping, CEM System for NOx

The recordkeeping requirements in § 22a-174-22e(j)(2)(D)(iv) appear to demand recordkeeping for data and records that are outside of what is needed to demonstrate compliance with this proposed section. For example, CEM systems routinely delete data due to data storage limitations and only select electronic data is stored for more than five years in CEM system. In addition, some facilities utilize the CEM system for operational information that have no impact on NOx compliance requirements proposed (e.g. a printout of hourly steam generation). As such, CBIA proposes to amend in §22a-174-22e(j)(2)(D)(iv) as follows:

- (iv) Charts, electronically stored data, and printed records produced by such CEM system **as needed to demonstrate compliance with this subsection;**

DEEP's Response to Written Comment 10, CBIA

DEEP agrees with intent and necessity of CBIA's recommended clarification to proposed RCSA section 22a-174-22e(j)(2)(D)(iv). However, the clarification should not be limited to compliance with the recordkeeping subsection. The final version of subclause (iv) should read as follows:

- (iv) Charts, electronically stored data, and printed records produced by such CEM system **as needed to demonstrate compliance with the requirements of this section;**

Written Comment 11, CBIA

Comments on §22a-174-22e(k)(3)(A): Reporting

The reporting requirements in § 22a-174-22e(k)(3) for an emission unit required to monitor NOx emissions with a CEM system is the submittal of a typical gaseous CEMS quarterly report. For an emission unit subject to this section using CEMS monitoring, the required averaging period found in various parts of § 22a-174-22e(d) is a daily block average, which is defined in § 22a-174-22e(a)(7). Although hourly CEMS data is collected and used to create the daily block average, CBIA proposes that the requirement to report *all hourly data* in § 22a-174-22e(k)(3)(A) be changed to ***all daily block average data***, since that is the averaging period that determines compliance. The hourly data on its own could be submitted with the report but would not provide the required compliance demonstration.

DEEP's Response to Written Comment 11, CBIA

DEEP agrees with the commenter. The final text of subparagraph (A) of RCSA section 22a-174-22e(k)(3) should read as follows:

- (A) All ~~hourly~~ **daily block average** data, in a format acceptable to the commissioner, for the three calendar month period ending the month before the due date of the report;

In addition, new subdivision (4) should be added to subsection (k) as follows:

- (4) Upon written notice, the commissioner may require any owner or operator subject to this section to provide all hourly CEM data, in a format acceptable to the commissioner, for the three calendar month period identified in such written notice.

Written Comment 12, CBIA

Comments on § 22a-174-22e(1)(6)(B): Emissions Testing

As proposed, this paragraph allows for sources to request the commissioner's approval to utilize alternative emission testing periods that are shorter than one hour, provided such a request is submitted at least 120 days prior to the scheduled testing. CBIA appreciates this flexibility incorporated into the proposed regulation and understands why submitting such request a minimum of 120 days prior to testing is appropriate for the first time an emission unit conducts testing. However, if DEEP reviews and approves such a request initially, the 120-day submittal requirement should not, in the interest of regulatory efficiency, be required every five years. As such CBIA proposes that DEEP amend § 22a-174-22e(1)(6)(B) as follows:

- (B) If the commissioner determines that three one-hour tests are not reasonable given the location, configuration or operating conditions of an emission unit, the commissioner may approve testing where compliance with the emissions limitations of this section shall be determined based on the average of test runs shorter than a one-hour period. ***For the first time that an emissions unit is tested under this section,*** approval of the commissioner for a shorter than one-hour test run shall be received prior to testing by submission of a request to the commissioner at least 120 days prior to the scheduled testing, requesting a specific test run duration and describing why a shorter time period is necessary.

DEEP's Response to Written Comment 12, CBIA

DEEP agrees with the purpose for the revision recommended in this comment and recommends that subsection (1)(6)(B) of RCSA section 22a-174-22e be revised as follows:

- (B) If the commissioner determines that three one-hour tests are not reasonable given the location, configuration or operating conditions of an emission unit, the commissioner may approve testing where compliance with the emissions limitations of this section shall be determined based on the average of test runs shorter than a one-hour period. **For the first time that an emissions unit is tested with a shorter than one-hour test run as provided in this subdivision, approval** of the commissioner for a shorter than one-hour test run shall be received prior to testing by submission of a request to the commissioner at least 120 days prior to the scheduled testing. ~~requesting a specific~~ **The request shall specify a** test run duration and ~~describing~~ **describe** why a shorter time period is necessary.

Written Comment 13, CBIA

Comments on § 22a-174-22f(c)(1): Exemptions

The list of exemptions proposed under § 22a-174-22f(c)(1) does not include non-road engines, as defined in 40 CFR Section 1068.30 or Section 89.2. It appears this was an oversight as an analogous exemption appears in § 22a-174-22e(c)(9). As such, CBIA proposes to add a paragraph under § 22a-174-22f(c)(1) as follows:

- (F) A non-road engine, as defined in 40 CFR Section 1068.30 or Section 89.2.

DEEP's Response to Written Comment 13, CBIA

DEEP agrees with the appropriateness of CBIA's suggested additional exemption from the requirements of RCSA section 22a-174-22f. The text of the final draft of RCSA section 22a-174-22f(c)(1) should be supplemented with new subparagraph (F) as follows:

- (1) The following emission units are exempt from this section:
- (A) An emission unit that is located at

- (D) An emission unit that is located at a hospital or health care facility and that is used to meet standards of The Joint Commission or the National Fire Protection Association for emergency electrical power systems; ~~or~~
- (E) A reciprocating engine operated by an EAS Participant, as defined in 47 CFR 11.2, to meet the equipment operational readiness requirements of 47 CFR 11.35.; **or**
- (F) **A non-road engine, as defined in 40 CFR 1068.30 or 40 CFR 89.2.**

In addition, the proposed exemption in RCSA section 22a-174-22e(c)(9) should be revised to appropriately cite the referenced sections of the CFR, as follows:

- (9) The requirements of this section shall not apply to non-road engines, as defined in 40 CFR ~~Section~~ 1068.30 or ~~Section~~ **40 CFR 89.2.**

Written Comment 14, UCONN

In 22e (e), "Emergency" and "emergency engine", it states having to substitute language from the former section 22 with the new 22e language. Could this be interpreted that if you have an older new source review permit with former section 22 language that you could be required to modify that permit to substitute the new section 22e language? UConn has a couple of older permits for emergency engines that the commenter assumes this would apply and the commenter does not want to modify permits unless necessary. The other interpretation could be that if you have a permit with the former section 22 language, you can simply assume that language can be read as the new section 22e language without having to modify the permit. Please provide clarification on this provision.

DEEP's Response to Written Comment 14, UCONN

The language in subsection (e) of proposed RCSA section 22a-174-22e is not intended to require that any owner or operator modify a permit. Rather, the plain language of the introductory paragraph states that terms used in a permit *shall be read* with the indicated meaning. Subsection (e) is intended to provide all existing permits with the clearer language of the definition of "emergency engine" used in proposed section 22a-174-22e. This is intended to benefit the regulated community and avoid enforcement actions for situations not clearly addressed by the current definition of "emergency engine."

For reference, the introductory paragraph of proposed RCSA section 22a-174-22e(e) says:

“On and after the effective date of this section, an individual permit or order issued to the owner or operator of an emission unit subject to this section that uses any of the following terms *shall be read as follows*.”

Written Comment 15, UCONN

22e (h)(5)(D), on page 19 of 32 of the draft, typo “sing” probably should be “using”.

DEEP’s Response to Written Comment 15, UCONN

DEEP agrees with UCONN’s comment. The text of subparagraph 22a-174-22e(h)(5)(D) of the final draft should read as follows:

- (D) Evaluate the cost of each feasible control alternative ~~sing~~ **using** a method approved by the commissioner. Cost shall be evaluated on an annualized full load basis (8760 hours/year) unless the hours of operation of the emission unit are subject to a practicably enforceable limitation; and

Written Comment 16, State of New Jersey Department of Environmental Protection

The New Jersey Department of Environmental Protection supports the Connecticut Department of Energy and Environmental Protection’s efforts in implementing RACT for control of NOx emissions. Updating the NOx RACT rules will help the Northern New Jersey-New York-Long Island-Connecticut nonattainment area attain the federal 8-hour average 75 parts per billion ozone NAAQS and protect public health.

DEEP’s Response to Written Comment 16, State of New Jersey Department of Environmental Protection

DEEP agrees that the adoption of this proposal will assist the NJ-NY-CT nonattainment area to attain the 2008 ozone NAAQS. DEEP acknowledges the efforts of New Jersey in revising New Jersey’s RACT-based emission limits for boilers, turbines and engines at an earlier date. New Jersey’s technical background and chosen regulatory provisions were a helpful guide to DEEP in developing the present proposal.

Written Comment 17, EPA Region I

DEEP should include a request to remove RCSA section 22a-174-22 from SIP and request that new sections 22a-174-22e and 22a-174-22f be approved into the SIP. These requests should be accompanied by an evaluation under CAA section 110(l), commonly referred to as the antibacksliding requirement. This evaluation should address whether the new regulations are collectively at least as stringent as the regulation that is requested to be removed from the SIP. The SIP revision should include the SIP-approved regulations that reference RCSA section 22a-174-22 and that are updated in this proposal with references to RCSA section 22a-174-22e or -22f, as appropriate.

DEEP’s Response to Written Comment 17, EPA Region I

DEEP acknowledges that the SIP revision submission associated with the adoption of the proposal will include the revisions to the air quality regulatory scheme as well as an evaluation pursuant to CAA Section 110(l) to demonstrate that new RCSA sections 22a-174-22e and 22a-

174-22f produce at least the NO_x emission reduction result achieved by RCSA section 22a-174-22. This proposal includes a number of provisions that update references to RCSA section 22a-174-22 in other air quality regulation sections, and those revised references will be submitted as part of the SIP revision submission.

Written Comment 18, EPA Region I

EPA's review of the control technology used by large emission sources in Connecticut indicates that these emission units are generally well controlled and are achieving significant emission reductions within the state. We noted this within our June 27, 2013 final rule that approved Connecticut's RACT certification for the 1997 ozone standard (78 FR 38587). Table 2 of that final rule contained a listing of the 10 largest NO_x emitting units in Connecticut and documented the NO_x controls and annual average NO_x emission rates for these units.

However, many of these large NO_x emission units are achieving emission rates in practice that are lower than the proposed section 22a-174-22e Phase 1 emission limits. For example, Middletown's unit 3, a cyclone boiler fueled by residual oil with natural gas as a back-up fuel, is controlled by water injection and selective noncatalytic reduction (SNCR). The proposed Phase 1 emission limit for cyclone boilers is a 24-hour average limit of 0.43 lb/MMBtu, and an ozone season limit of 0.2 lb/MMBtu and a non-ozone season limit of 0.15 lbs/MMBtu. Data from EPA's Air Markets Program Data (AMPD) indicates that this unit operated with a daily average NO_x rate below 0.3 lbs/MMBtu on most days in 2014 and 2015. Connecticut should review the daily NO_x emission rate data for this and other residual oil-fired EGU boilers to determine whether lowering the Phase 1 RACT limits for such equipment is feasible.

In addition, the proposed Phase 1 NO_x RACT limit for coal-fired boilers is a 24-hour average limit of 0.28 lb/MMBtu and seasonal limits of 0.15 lb/MMBtu. Data for 2014 and 2015 from EPA's AMPD indicates that Bridgeport Harbor, the only operating coal-fired EGU boiler in Connecticut, routinely operates at an average daily emission rate below 0.165 lbs/MMBtu. Given Bridgeport Harbor's demonstrated ability to operate consistently at levels below the proposed Phase 1 limit, DEEP should consider reducing the allowable RACT rate for coal-fired EGU boilers. Given that DEEP intends to allow its trading program to continue in Phase 1, DEEP should review recent NO_x emissions data from other subject units to identify and tighten any other compliance margins it determines are unnecessarily large.

DEEP's Response to Written Comment 18, EPA Region I

DEEP appreciates EPA's review of the data and suggestions on the emissions limitations in Phase 1 of RCSA section 22a-174-22e.

With regard to the Phase 1 emission limitation for cyclone boilers, DEEP designed Phase 1 of the emissions limitations to serve as a glide path to full compliance in Phase 2. DEEP also added an ozone season limitation to the daily block average emission limitations. DEEP further reduced the cyclone emission limitation in Phase 1 for operation on gas. DEEP declines to make additional reductions in the emission limitations for cyclone boilers in Phase 1, as such a reduction might require significant actions concerning the state's single cyclone boiler operated by NRG at the Middletown facility. Furthermore, all of the days on which the boiler's daily average NO_x rate is above the 0.3lbs/MMBtu occur during the non-ozone season (in 2014 and 2015). The reductions in the emission limitations in Phase 2 will address the cyclone's emissions on a reasonable timeframe and bring the level of control to RACT.

In terms of Phase 1 emission limitations for the other residual oil-fired EGU boilers in Connecticut, DEEP reviewed the daily AMPD data for 2014 and 2015. On some days during the non-ozone season, most likely when the boilers were operating solely on residual oil, several of the boilers exceeded the daily Phase 1 residual oil emissions limitation in RCSA section 22a-174-22e. The Phase 1 ozone season emissions limitations and Phase 2 reduction in daily emissions limitations for residual oil-fired EGU boilers provides a reasonable timeframe for a RACT level of control for these boilers.

With regard to the Phase 1 emission limitation for coal-fired boilers, DEEP has reduced the emission limitation from 0.38 lbs/MMBtu for coal-fired boilers, which is now required in RCSA section 22a-174-22. Given the inclusion of the ozone season limitation for coal-fired boilers of 0.15 lb/MMBtu and the intention of Phase 1 of acting as a glide path toward full compliance, DEEP declines to make an additional reduction in the daily block average emission limitation. In recent years, the state's single remaining coal-fired boiler, PSEG Bridgeport Harbor Unit 3, has operated a limited number of hours. Furthermore, PSEG has announced the planned retirement of Unit 3 as of July 2021, and the intention to construct a 485MW gas-fired combined cycle plant at Bridgeport Harbor. Connecticut is highly unlikely to have a new coal-fired boiler constructed in the foreseeable future. Given these facts, an additional reduction in the Phase 1 emission limitation for coal-fired boilers will accomplish little, except to complicate the remaining hours of Unit 3's operation.

Written Comment 19, EPA Region I

EPA recommends that Connecticut work with the region's electrical dispatching authority, ISO-New England, to limit the need for large, uncontrolled emission units to operate on days with poor air quality. For example, Montville's large, uncontrolled residual oil-fired boiler only operated on 14 days in 2015, but one of these days, July 21, 2015, was a day forecasted to be, and which was in fact, an exceedance day in Connecticut. Montville emitted 7.8 tons of NO_x on that day.

DEEP's Response to Written Comment 19, EPA Region I

DEEP appreciates EPA's comment and will consider such an approach in the future, while recognizing that ISO-New England necessarily is primarily concerned with electric reliability, not air quality.

Written Comment 20, EPA Region I

DEEP should consider eliminating from its NO_x regulation emission limits that are no longer relevant in the state. For example, an emission rate of 0.43 lb/MMBtu is being retained for coal-fired cyclone boilers serving EGUs, but there are no longer any such boilers in the state.

DEEP's Response to Written Comment 20, EPA Region I

DEEP agrees with EPA's comment. The final text in the table of RCSA subsection 22a-174-22e(d)(2)(A) should be revised as follows:

	Gas-fired (lb/MMBtu)	Residual oil-fired (lb/MMBtu)	Other oil-fired (lb/MMBtu)	Coal-fired (lb/MMBtu)
Cyclone boiler	0.30	0.43	0.43	0.43 ***
Other boiler	0.20	0.25	0.20	0.28

Written Comment 21, EPA Region I

Connecticut's proposed revisions to section 22a-174-22e indicate that the use of existing, banked NOx Discrete Emission Reduction Credits (DERCs) to comply with applicable emission limits will continue within Phase 1, which begins June 1, 2018, but will end at the start of Phase 2, beginning on June 1, 2022. We support Connecticut's intention to end the use of DERCs as a compliance option, as it should result in additional NOx reductions within the state as sources seek other means to comply with the limits within section 22a-174-22e, and request that this phase-out occur earlier to the extent that is practicable. Additionally, in keeping with the D.C. Circuit Court's July 10, 2009 remand of a portion of EPA's November 29, 2005 Phase 2 ozone implementation rule dealing with NOx RACT, we note that any use of DERCs as a RACT compliance option needs to ensure that DERCs used for compliance were generated from a source(s) located within the same nonattainment area as the source using the DERCs.

DEEP's Response to Written Comment 21, EPA Region I

Regarding EPA's request to phase-out the use of DERCs as a compliance option sooner than June 1, 2022, DEEP does not agree that such an approach would be prudent given the investments that sources have made to create and hold the DERCs that will be used during Phase 1. Furthermore, as no new DERC generation will be permitted after June 1, 2018 and as the DERCs have a 5-year life span from generation, the supply of DERCs may in fact be limited and effectively phase-out DERC use earlier than May 31, 2022. DEEP is satisfied with this as the method to end the use of the DERC trading program, which has been in place for over 20 years.

Regarding EPA's statement that any use of DERCs as a RACT compliance option needs to ensure that DERCs used for compliance were generated from a source located within the same nonattainment area as the source using the DERCs, DEEP will coordinate with EPA on this issue at the time that DEEP establishes the language for the Trading Agreements & Orders that will authorize DERC use in Phase 1.

Written Comment 22, EPA Region I

As you know, on October 1, 2015, EPA announced a tightened ozone NAAQS, and it is likely that Connecticut will have portions of the state found to be in nonattainment of this standard when designations are made in 2017. In light of this, Connecticut should consider moving up the start date for Phase 2, which is currently slated to begin in 2022, to 2021, or earlier, to maximize the impact that the emission reductions achieved by these tightened emission limits will have on ozone air quality levels in the state. Additionally, we note that the SIP requirements rule for the 2008 ozone NAAQS requires that controls adopted to meet RACT for that standard be effective by January 1, 2017.

DEEP's Response to Written Comment 22, EPA Region I

DEEP does not agree with EPA's request to move the proposed compliance start dates for Phase 1 and Phase 2 to earlier dates because of the reduction in compliance planning time that would result from this action. Many representatives from Connecticut's regulated community have been involved in the development of this proposal since 2014 and have already begun budgeting and planning processes that rely on the dates included in the proposal.

Furthermore, although DEEP is well aware of the need to obtain additional reductions in ozone levels in the state given the current nonattainment status under the 2008 ozone NAAQS, DEEP is also well aware that the ozone precursor reductions created by the proposal, even if fully

implemented by January 1, 2017, will not result in the state attaining the 2008 ozone NAAQS. Such a situation will only occur when contributions to Connecticut's ozone levels from upwind sources are reduced considerably.

Written Comment 23, EPA Region I

The emission testing requirements of section 22a-174-22e(1)(7) state, "An owner or operator shall demonstrate compliance with the emissions limitations of this section using sampling and analytical procedures under 40 CFR 60, Appendix A or, for affected units, under 40 CFR 75, or under alternative procedures approved by the commissioner." Since the intent is for this rule to be incorporated into the SIP, any alternative procedures should be approved by the state and EPA.

DEEP's Response to Written Comment 23, EPA Region I

DEEP understands EPA's suggestion and chooses instead to revise the text of proposed subsection (1)(7) to eliminate the reference to alternative procedures. The final text of RCSA section 22a-174-22e(1)(7) should be revised as follows:

(7) An owner or operator shall demonstrate compliance with the emissions limitations of this section using sampling and analytical procedures under 40 CFR 60, Appendix A or, for affected units, under 40 CFR 75, or under ~~alternative procedures approved by the commissioner~~ **in RCSA section 22a-174-5(d)**. Sampling shall be conducted when the emission unit is at normal operating temperature and, unless allowed otherwise by the commissioner in a permit or order, is operating at or above 90 percent of maximum capacity, except

Written Comment 24, EPA Region I

In its Regional Haze SIP submittal, Connecticut relied on a weight of evidence demonstration that the State's alternative to Best Available Retrofit Technology (BART) plan would result in greater reasonable progress than source-by-source BART determinations. Part of the State's alternative to BART plan relied on NO_x emission reductions achieved through the implementation of section 22a-174-22, including subdivision 22a-174-22(e)(3). Specifically, the alternative to BART plan relied on the requirement that starting in October 2003, NO_x Budget Program sources that are also subject to section 22a-174-22 meet a non-ozone seasonal NO_x emission rate of 0.15 lb/MMBtu.

With the proposed repeal of section 22a-174-22, DEEP should ensure that these emission reductions relied upon for Regional Haze will be preserved and maintained in sections 22a-174-22e and -22f and Connecticut's Regional Haze Plan be updated accordingly. Since section 22a-174-22 is proposed to be repealed as of June 1, 2018, DEEP could address this issue in the Regional Haze SIP that will be submitted for the next planning period.

DEEP's Response to Written Comment 24, EPA Region I

DEEP understands the need to maintain the non-ozone season emission limitation of RCSA section 22a-174-22 and so preserved such limitations in RCSA sections 22a-174-22e (in subparagraphs (d)(2)(B), (d)(2)(D), (d)(3)(B), (d)(3)(D), (d)(4)(B), (d)(4)(D), (d)(5)(B), and (d)(5)(D)) and 22a-174-22f (in subsections (b)(6) and (e)(4)).

DEEP intends to address the repeal of RCSA section 22a-174-22 and the inclusion of the non-ozone season emission limits relied upon in its Regional Haze SIP in RCSA sections 22a-174-

22e and 22f in DEEP's next Regional Haze SIP and will also discuss this point in the SIP revision that DEEP makes to add RCSA sections 22a-174-22e and -22f to the SIP.

Written Comment 25, EPA Region I

We note the definition of "emergency" in section 22a-174-22e allows emergency engines to operate when there is a deviation of voltage from the electricity supplier to the premises of three percent above, or five percent below, standard voltage or operation, or during the period of time the New England region system operator is implementing voltage reductions or involuntary load interruptions in accordance with Action 6 of the ISO New England Operating Procedure No. 4 - Action During a Capacity Deficiency. Please be aware, on May 4, 2016, the U.S. Court of Appeals for the D.C. Circuit vacated the provisions in the Reciprocating Internal Combustion Engine (RICE) NESHAP (National Emissions Standards for Hazardous Air Pollutants) and NSPS (New Source Performance Standards) which allow emergency engines to operate for up to 100 hours for emergency demand response when the Reliability Coordinator has declared an Energy Emergency Alert Level 2 or for voltage or frequency deviations of 5 percent or greater below standard voltage or frequency. Specifically, the provisions in 40 CFR 63.6640(f)(2)(ii)-(iii), 60.4211(f)(2)(ii)-(iii), and 60.4243(d)(2)(ii)-(iii) were vacated. Therefore, Connecticut's definition of "emergency" conflicts with the NSPS and NESHAP emergency engine operational requirements. Emergency engines subject to section 22a-174-22e must also comply with the RICE NESHAP and/or NSPS requirements, if applicable. Consequently, emergency engines operating for voltage or frequency deviations or in emergency demand response under Section 22a-174-22e or 22a-174-22f may be required to meet the non-emergency engine requirements of the NESHAP and NSPS regulations, including any applicable NO_x limitations for non-emergency engines.

DEEP's Response to Written Comment 25, EPA Region I

DEEP is aware of the NESHAP and NSPS regulation requirements as modified by the recent vacatur and of the differences in the definitions of "emergency" used in the NESHAP and NSPS as compared with DEEP's proposed definition of "emergency" in both RCSA sections 22a-174-22e and -22f.

As a result of the vacatur, the Independent System Operator – New England (ISO-NE) filed a limited waiver request with the Federal Energy Regulatory Commission to allow market participants to change the status of their demand resource from Real-Time Emergency Generation (RTEG) to Real Time Demand Response. While the RTEG program continues at this time, the future of the RTEG program beyond 2018 is unclear, and DEEP understands that ISO-NE's future actions may require an adjustment of DEEP's proposed definition of "emergency." For now, no changes are necessary to the proposed definition.

Furthermore, as EPA notes, an emergency engine that is operated for voltage deviations under DEEP's proposed definition of "emergency" must operate as a non-emergency engine under the RICE NESHAP and RICE NSPS, including compliance with the emission limits of the RICE NESHAP and NSPS, because operation under DEEP's voltage deviation provisions is not considered emergency operation under the RICE NESHAP or NSPS. DEEP will work to identify this difference to the regulated community.

Written Comment 26, EPA Region I

There are a number of instances within proposed section 22a-174-22e where the existing

regulation, section 22a-174-22, is referenced. In many such instances, such as within paragraph (g)(2)(A), the reference is made to “a 2014 baseline average emission rate, as determined by a CEM system according to former section 22a-174-22,” and to “the most recent emission test performed pursuant to former section 22a-174-22.” Such references do not appear to present any difficulties upon the sun-setting of section 22a-174-22 on May 31, 2018. However, some of the references to section 22a-174-22 refer back to definitions which, upon that rule's termination, may become problematic when that regulation no longer has standing. Specifically, paragraph (e)(3) of section 22a-174-22e relies on definitions within section 22a-174-22 that will no longer be current after May 31, 2018. Connecticut should remove such references to definitions within section 22a-174-22 from proposed regulation section 22a-174-22e.

DEEP's Response to Written Comment 26, EPA Region I

DEEP understands the issue raised by EPA to be that the references to definitions in a repealed regulation will be a problem because the text of the repealed regulation may not be available after the date of repeal. However, DEEP can assure EPA that the references to the definition of "emergency" and "emergency engine" in subsection (e)(3) will not create such a circumstance. The introductory text of subsection (e) limits the subsection to language in permits or orders that refer to the definitions of "emergency" and "emergency engine" in RCSA section 22a-174-22. Because the section refers to a substitution in the reference (i.e., substitute the phrase "emergency engine as defined in RCSA section 22a-174-22e(a)" for the phrase "emergency engine as defined in RCSA section 22a-174-22"), the repeal of RCSA section 22a-174-22 will not prohibit an owner or operator from making the required substitution. Furthermore, the definition of "emergency" is expanded and clarified in RCSA section 22a-174-22e(a), so it will be to an owner or operator's advantage to be able to make the substitution.

While reviewing EPA's comment on this issue, DEEP realized that paragraph (e)(3) of section 22a-174-22e should be revised as follows:

- (3) If the definition of “emergency engine” or “emergency” as defined in RCSA section 22a-174-22 is ~~repealed~~ **referenced**, the owner or operator shall substitute the language of the appropriate term as defined in subsection (a) of this section.

Written Comment 27, EPA Region I

Given the applicability criteria of section 22a-174-22f, and the likelihood that a large number of small to medium sized sources will be covered by the rule, we recommend that Connecticut conduct a thorough outreach campaign to inform sources subject to the rule of its requirements.

DEEP's Response to Written Comment 27, EPA Region I

DEEP has been diligent with outreach efforts associated with the development of new section 22a-174-22e and -22f and is aware of the need for additional outreach for the non-major sources of NOx that are the subject of RCSA section 22a-174-22f. DEEP is planning to perform such outreach.

Written Comment 28, EPA Region I

A provision within section 22a-174-22f at subsection (e)(l) allows a facility to "request an enforceable emission limitation to a level below the daily NOx emission thresholds." Once

granted, such facilities become exempt from the tune-up requirements of paragraph (f), the recordkeeping requirements of paragraph (g), and the reporting requirements of paragraph (h) of section 22a-174-22f. DEEP should ensure that any such permit/order issued to such a facility includes requirements that enable one to determine whether or not the daily NOx emission thresholds have been exceeded. We also recommend that paragraph (e)(1) state that if the unit later exceeds the daily NOx emissions thresholds, the unit would once again be subject to the applicable requirements.

DEEP's Response to Written Comment 28, EPA Region I

DEEP agrees with EPA that the conditions of the permit or order issued to a source to define a daily emission limitation for a particular source should require the source owner to maintain records sufficient to determine whether or not compliance with the requirements of the permit or order is achieved. DEEP also agrees to add a sentence to the end of section 22a-174-22f(e)(1) as recommended. In so doing, DEEP should subdivide the subdivision into two subparagraphs, as follows, and clarify the application of the tune-up requirements, as provided in the response to **Written Comment 8, CBIA**:

- (1) The owner or operator of an emission unit subject to this section that is not an emergency engine or an affected unit shall comply with the record keeping requirements of subsection (g) of this section; the reporting requirements of subsection (h) of this section; and, **if the emission unit is an ICI boiler or a reciprocating engine**, the tune-up requirements of subsection (f) of this section, **except as follows**:
 - (A) If the owner or operator of an emission unit subject to this section that is not an emergency engine or is not an affected unit requests an enforceable emission limitation to a level below the daily NOx emission thresholds of subdivision (2) of this subsection and the commissioner grants such a request, the owner or operator is no longer required to operate the emission unit in compliance with subsections (f), (g) and (h) of this section. Such enforceable limitation on daily NOx emissions shall be issued in an order or modification to an existing permit; **and**
 - (B) **If an emission unit subject to a limitation as provided in subparagraph (A) of this subdivision subsequently exceeds the applicable NOx emission threshold of subdivision (2) of this subsection, such an emission unit shall thereafter operate such an emission unit in compliance with RCSA section 22a-174-22e.**

Written Comment 29, Sierra Club

Establishing robust NOx RACT requirements is particularly important to Connecticut, which is struggling to achieve both EPA's 2008 and 2015 ozone standards. While ozone source apportionment modeling confirms that many sources and source categories outside of the State contribute significantly to Connecticut's ozone nonattainment and thereby limit Connecticut's ability to resolve its air quality issues through in-state actions alone, the fact of Connecticut's reliance on pollution reductions from upwind states underscores the importance of having clean hands when calling upon these states to reduce their emissions. The proposed NOx RACT regulation goes a significant distance in modernizing Connecticut's NOx RACT requirements for fuel-burning emission units and strengthening Connecticut's position in seeking commensurate emission reductions from upwind states.

In particular, the commenter wishes to highlight two aspects of the proposed regulation. First, the case-by-case RACT demonstration of economic infeasibility creates a presumption that a NO_x control is economically feasible if the cost per ton of NO_x reduced for a Phase 1 demonstration is \$13,118 and for a Phase 2 demonstration is \$13,635.² The regulation clarifies that “[c]ost shall be evaluated on an annualized full load basis (8760 hours/year) unless the hours of operation of the emission unit are subject to a practically enforceable limitation.”³ While the commenter continues to believe, consistent with prior EPA statements,⁴ that economic feasibility “rests very little on the ability of a particular source to ‘afford’ to reduce emissions to the level of similar sources” but, rather, “economic feasibility for RACT purposes is largely determined by evidence that other sources in a source category have in fact applied the control technology in question,”⁵ the commenter appreciates Connecticut’s efforts to establish a robust cost-effectiveness threshold. And the commenter believes that in its implementation, this standard will help to ensure that sources within a source category are required to achieve comparable levels of control, as EPA intended.

DEEP’s Response to Written Comment 29, Sierra Club

DEEP appreciates the commenter’s words of support for the proposal and the economic feasibility threshold of the case-by-case RACT demonstration.

Written Comment 30, Sierra Club

The commenter strongly supports the requirement that the alternative compliance options identified in Subsections 22a-174-22e(g) and (h) sunset in May 2028.⁶ It is both reasonable and appropriate to establish a date by which all sources in Connecticut must meet the Phase 2 NO_x RACT requirements. Indeed, requiring this type of uniformity is consistent with the EPA preamble cited above, which clarifies RACT’s goal of ensuring that sources within a source category achieve similar levels of control. Moreover, setting the deadline by which this uniformity must occur more than a decade out provides more than ample compliance time.

DEEP’s Response to Written Comment 30, Sierra Club

DEEP agrees that it is important to set a date in the proposal by which all subject emission units must comply with the RACT standards. This will prevent the continued operation of aged, high emitting equipment, a situation which has arisen under RCSA section 22a-174-22 as a result of the 1994 vintage emission limits and the continued use of the DERC emissions trading program.

Written Comment 31, MIRA

The commenter has reviewed proposed RCSA §22a-174-22e and the proposed repeal of RCSA §22a-174-22, and is requesting that DEEP please clarify the language and timelines associated with the generation and trading of NO_x DERCs, which are currently created and traded under the “Emissions reduction trading” provisions of RCSA §22a-174-22(j). Specifically, RCSA §22a-174-22 is proposed to be repealed on June 1, 2018. Current Trading Agreements & Orders

² Proposed R.C.S.A. § 22a-174-22e(h)(1)(A)(iii).

³ *Id.* § 22a-174-22e(h)(5)(D).

⁴ U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the CAA Amendments of 1990; Supplemental, 57 Fed. Reg. 18,070, 18,074 (Apr. 28, 1992).

⁵ *Id.*

⁶ *See* Proposed R.C.S.A. § 22a-174-22e(g)(11) & (h)(4).

(TA&Os) issued pursuant to §22a-174-22 will expire on 5/31/2017. Will the TA&Os be extended for one additional year to allow for DERC creation through 5/31/2018?

DEEP's Response to Written Comment 31, MIRA

DEEP intends to initiate discussions regarding the extension of NOx Trading Agreements and Orders in the near future with the regulated community. For those owners and operators currently operating an emission unit under a NOx Trading Agreement & Order, it is likely that two more NOx Trading Agreements and Orders would be issued if the owner/operator intends to use NOx DERCs as a compliance option in Phase 1. One Trading Agreement & Order will address operations under RCSA section 22a-174-22 through May 31, 2018 (including DERC creation and use), and one Trading Agreement & Order will address operations under Phase 1 of RCSA section 22a-174-22e (only including DERC use).

Written Comment 32, MIRA

RCSA §22a-174-22e(g) allows for the use of “existing, banked, NOx DERCs” during the Phase 1 period in accordance with an order or permit modification to be issued by DEEP. “Existing” as of what date? June 1, 2018? “Banked” as of what date? The first day of the month during the Phase 1 period that they are needed?

Will an owner/operator who utilizes the NOx DERC compliance option be required to have all of its NOx DERCs needed for the Phase 1 period banked by June 1, 2018 (i.e., the first day of the Phase 1 period), or will owners/operators still be able to buy/sell NOx DERCs during the Phase 1 period from other owners/operators with banked DERCs?

DEEP's Response to Written Comment 32, MIRA

DEEP intends to address all questions raised by the commenter in any Trading Agreements and Orders that may be issued to address the use of “existing, banked, NOx DERCs” compliance option provided in RCSA section 22a-174-22e(g).

Written Comment 33, NRG

Focusing on NOx emission reductions from Electric Generating Units will have negligible impact on Connecticut air quality.

This regulation is intended to provide the framework for emission reductions to improve the overall air quality in Connecticut. The regulation is intended to govern and will directly impact the regulated generation community and the sources supplying an Electrical Generating Unit (“EGU”) specifically.

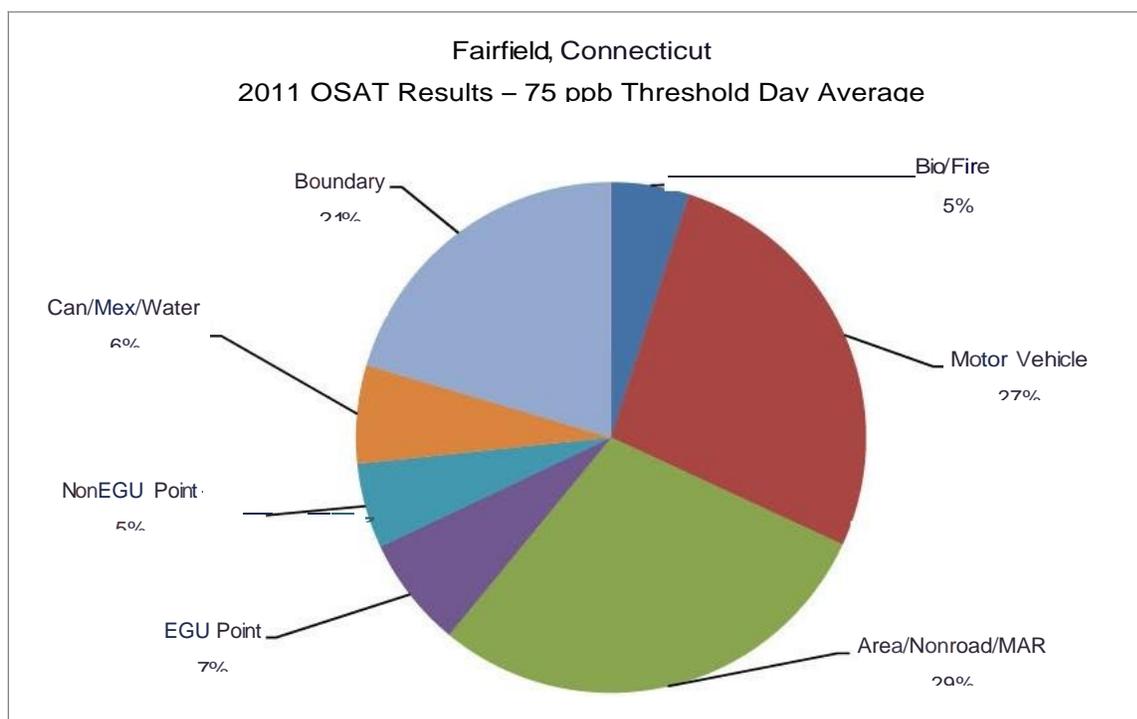
The commenter’s regional modeling analysis, conducted by Alpine Geophysics⁷ in June 2016 and summarized in Figure 1 reveals that ratcheting down the allowable emissions, up to and including forcing full shutdown of all of NRG’s EGUs, would have very little effect on overall air quality in Connecticut. The general basis for the analysis performed by Alpine Geophysics could be expanded to other EGUs in evaluating the overall actual impact that compliance with the new RCSA section 22a-174-22e would have.

⁷ “Impact Analysis of NRG High Energy Demand Day (HEDD) Control on Connecticut Monitor Ozone Concentrations”, Prepared by Alpine Geophysics, LLC, June 2016, submitted as Appendix A (Alpine Report).

As the Alpine Geophysics modeling report demonstrates, there would be very little impact made by prescriptive emission reductions aimed at the EGUs. Based upon this analysis and the fact that forced emission reductions do not actually result in an overall improvement in air quality, there is also a significant downside to this regulation as proposed which should be taken into consideration. A few examples of the potential negative impacts that the new Section 22e could have are:

1. Increasing the cost of electric power in Connecticut.
2. Decreasing the fuel diversity that could result in decreased reliability of supply.
3. Placing direct and indirect local employment and tax revenue at risk.

Figure 1-Relative contribution of source emissions to Fairfield, CT ozone monitor



The electric generators have materially reduced their air emissions since 1999, which is why the EGUs have such a little impact on the air quality in Connecticut. Since 1999, NO_x, CO₂ and SO₂ emissions have all decreased substantially while the New England electrical load has increased. Specifically, NO_x emissions have decreased 71% from 1999 to 2013, while ISO-NE total generation has increased 12%.⁸

According to the Draft SIP, the major stationary sources are a minor source of NO_x emissions and VOCs. The Draft SIP further acknowledges that the ability to achieve additional substantial reductions from this sector alone is limited:

“Connecticut’s major stationary sources of NO_x emitted about 5902 tons of NO_x in 2011, according to Connecticut’s 2011 emissions statement reporting. These stationary sources

⁸ “Ozone Air Quality in Connecticut”, U.S. Environmental Protection Agency, Presented by Curt Spalding to CBIA, June 19, 2015. http://www5.cbiam.com/events/wp-content/uploads/2015/06/CBIA_final_06_19_15.pdf

account for approximately 7.5% of the NO_x emissions inventory. Connecticut's major stationary sources of VOC emitted approximately 880 tons according to the 2011 emissions statement reporting. This amounts to approximately 1% of the statewide total annual VOC emissions (not including biogenic emissions). Thus, opportunities for Connecticut to reduce ambient ozone levels through control of its major stationary sources are severely limited. The impact of mobile and area source emissions, and pollution transported from other states, on ozone values in Connecticut, cannot be overstated. Significant reductions from sources in upwind states are crucial to Connecticut's ability to attain and maintain the ozone NAAQS."⁹

DEEP's Response to Written Comment 33, NRG

DEEP agrees that transported air pollution continues to have a significant impact on Connecticut's air quality. However, Connecticut is required by sections 182(a) and (b) and 184(b) of the CAA to adopt and update RACT-based emissions limitations for all major sources of NO_x with the promulgation of a revised ozone NAAQS. *There is no emission reduction or ozone concentration reduction requirement associated with the implementation of RACT.* Connecticut's current RACT emissions limitations in RCSA section 22a-174-22 have been in place for over 20 years. New Jersey revised its NO_x RACT regulations in 2009 and NY revised its NO_x RACT regulations in 2010 in order to address the RACT requirement for the 2008 ozone National Ambient Air Quality Standard (NAAQS). Connecticut lags behind the other states with which it shares a moderate nonattainment area under the 2008 ozone NAAQS (the result of a June 2016 "bump-up" in nonattainment classification by EPA¹⁰) in terms of updating NO_x RACT requirements, and a number of the emission limitations, including those set out for EGU boilers in RCSA section 22a-174-22, no longer represent a RACT level of control.

As stated in its "Good Neighbor" State Implementation Plan (SIP) submission to EPA on June 15, 2015

(<http://www.ct.gov/deep/lib/deep/air/ozone/ozoneplanningefforts/GoodNeighborSIP.pdf>), updating RACT for major sources will "serve the dual purpose of meeting CAA requirements for Connecticut's nonattainment areas and further reducing Connecticut's statewide contribution to interstate transport in the New York and New Jersey portions of the multistate areas as well as in other downwind areas." Failure to submit updated NO_x RACT rules to EPA may ultimately trigger a sanctions clock, and result in loss of federal highway funds.

Written Comment 34, NRG

The electrical grid in the State of Connecticut, and all of New England, now relies heavily on natural gas-fired generation for electricity. Between 2000 and 2015¹¹, the fuel diversity in the region diminished. In 2015, 44% of the total electric generating capacity in New England relied

⁹ "Reasonably Available Control Technology Analysis under the 2008 8-Hour Ozone national Ambient Air Quality Standard", July 17, 2014, Connecticut Department of Energy and Environmental Protection, Bureau of Air Management (page 7).

http://www.ct.gov/deep/lib/deep/air/ozone/ozoneplanningefforts/RACT_2008_NAAQS/2014-07-17_-_CT_Final_RACT_SIP_Revision.pdf

¹⁰ The Greater Connecticut area was also bumped-up to moderate nonattainment under the 2008 ozone NAAQS. See 81 FR 26697 (May 4, 2016).

¹¹ 2016 Connecticut Comprehensive Energy Strategy, Scoping & Public Input Session, May 24, 2016. Prepared by Connecticut Department of Energy and Environmental Protection., "Regional Fuel Mix", original source ISO New England Net Energy and Peak Load by source.

http://ct.gov/deep/lib/deep/energy/ces/CES_Public_Scoping_Presentation_May_24_2016.pdf

on natural gas.¹² In 2000, only 15 % of all electricity produced in the region came from natural gas. This shift means that the region now relies heavily on natural gas. In particular, during the winter, the availability of natural gas becomes constrained due to non-generation demands and the ability to produce electricity with natural gas may be less reliable. The ISO-NE wholesale electric market response is to reduce natural gas use for power generation and to increase generation from other fuels during these times.

Another emerging trend to monitor is the accelerating retirements of a significant amount of EGUs in the region. Recent generator retirements¹³ in New England include the following units:

Table 1 Recent or Announced Generating Retirements in New England

Plant (Number of Units)	Capacity	Fuel
Salem Harbor (4)	749 MW	Coal & Oil
Vermont Yankee (1)	604 MW	Nuclear
Norwalk Harbor (3)	342 MW	Oil
Brayton Point (4)	1535 MW	Coal & Oil
Mount Tom (1)	143 MW	Coal
Pilgrim Nuclear (1)	677 MW	Nuclear
Total	4,050 MW	

RCSA section 22a-174-22e mandates that all EGUs that are unable to meet the new lower NOx emission rates must retire no later than May 1, 2028 (if not sooner). The EGUs that may not be able to meet the new lower standards are units that provide fuel diversity to the regional system such as NRG's oil-fired boilers. DEEP¹⁴ has identified the following units as "at risk." These units are in Connecticut and represent nearly 2,100 MW of capacity, including oil and coal.

- Middletown (756 MW, oil & gas)
- Montville (482 MW, oil & gas)
- New Haven (450 MW, oil & gas)
- Bridgeport Harbor (410 MW, coal)

Our increasing reliance on natural gas to produce electricity and the anticipated retirements of non-natural gas units from the region, place Connecticut and the region at a high risk of facing a fuel diversity crisis. The requirement that all generation relying on a compliance option or a Case-by-Case RACT retire no later than May 1, 2028 may place the reliability of the region at risk with the potential to trigger a significant amount of retirements on or about the same timeframe.

RCSA section 22a-174-22e needs a safety valve to ensure that if the ISO-NE is in a fuel diversity crisis due to the retirement of EGUs associated with this regulation, the State should allow for an extension of the mandatory retirement date of May 1, 2028.

DEEP's Response to Written Comment 34, NRG

DEEP notes the start-up years and recent operating hour histories of the units referred to in the comment:

¹² Ibid, "Winter Operations Highlighting Natural Gas Pipeline Constraints as a Continuing Reliability Challenge"

¹³ Ibid. "Generator Retirements"

¹⁴ Ibid. "Generator Retirements"

Unit	Start-up year	2013 Operating Hours/Annual/1 st Quarter	2014 Operating Hours/Annual/1 st Quarter	2015 Operating Hours/Annual/1 st Quarter	2016 1 st Quarter Operating Hours
Middletown 2	1958	915/182	1257/235	2229/326	175
Middletown 3	1964	328/235	789/271	1906/292	50
Middletown 4	1973	229/94	248/196	71/35	0
Montville 5	1954	541/279	456/362	302/257	0
Montville 6	1971	117/22	184/154	237/132	6
New Haven Harbor 1	1975	846/311	1166/939	794/360	25
Bridgeport Harbor 3	1968	2548/1100	2956/1838	2101/1777	287
Total		5524/2223	7056/3995	7640/3179	543

DEEP further notes the following:

- 1) In early 2016, PSEG announced the retirement of Bridgeport Harbor 3 by July 1, 2021. PSEG is currently undergoing the permitting process for a 485 MW combined cycle turbine slated to start-up in January 2018 (the unit cleared ISO-NE's Forward Capacity Auction in February 2016). In the new combined cycle turbine permit, DEEP intends to allow up to 720 hours of ultra-low sulfur diesel (ULSD) oil usage when ISO-NE declares an Energy Emergency and requests the firing of ULSD and for other limited circumstances.
- 2) Towantic Energy, a 805 MW combined cycle facility (two turbines) is currently undergoing construction and is slated to start-up in July 2017. The turbines are dual-fuel capable (gas/distillate oil).
- 3) The other large combined cycle turbine facilities in Connecticut (Bridgeport Energy (2 gas-fired turbines), Lake Road (3 dual-fuel capable turbines), Milford Power (2 dual-fuel capable turbines), Kleen Energy (2 dual-fuel capable turbines)) typically operate many more hours (more than 5000 annual hours **per unit**) than the "at risk" units referenced in the comment. The annual operating hours during 2013, 2014 and 2015 of all of the "at risk" units referenced in the comment are roughly equivalent to the annual operating hours of one combined cycle turbine. It is reasonable to expect that the new PSEG and Towantic combined cycle turbines will operate a similar number of hours as the existing combined cycle turbines in Connecticut.
- 4) It appears that a significant percentage (approximately 40-57%) of total 2013-2015 operating hours of the units referenced in the comment was during the 1st quarter when natural gas supply was constrained, especially during the Polar Vortices that occurred during the winters of 2014-2015. 2016 total 1st quarter operating hours of the aforementioned units was extremely low; a reflection of the mild winter. As mentioned previously, the new PSEG and Towantic combined cycle facilities, as well as the existing Lake Road, Milford and Kleen Energy combined cycle facilities are dual-fuel capable. In addition, the commenter operates an existing fleet (twelve units) of dual-fuel capable simple cycle turbines in Connecticut.

- 5) Regarding the 4,050 MW of capacity recently retired or announced to retire in New England, DEEP provides the following excerpt from a 2/29/16 ISO-NE press release titled *Finalized Capacity Auction Results Confirm 10th FCA Procured Sufficient Resources, at a Lower Price, for 2019–2020*:

The auction acquired 31,371 MW of generation, including 1,459 MW of new generation. This includes three large, dual -fuel power plants totaling 1,300 MW proposed for Southeast Massachusetts, Rhode Island, and Connecticut. These new power plants will help close the gap created by recent or pending retirements of more than 4,200 MW of coal, oil, and nuclear generation. The auction also cleared 2,746 MW of demand-side resources, including energy-efficiency measures and demand-response assets, and 1,450 MW of imports from New York and Canada.

- 6) By 2028, the units referenced in the comment will range in age from 53 to 74 years. DEEP has provided staggered compliance schedules over ten years and several compliance options to provide flexibility for stakeholders to develop long-term plans for future operations.
- 7) The current language in proposed RCOSA section 22a-174-22e(h)(4) already provides a so-called “safety valve” by the first phrase of the subdivision “Unless otherwise specified in an order or permit . . .” as this phrase allows for continuation of a particular case-by-case RACT demonstration beyond April 30, 2028.

Therefore, DEEP should not change the proposal as a result of the comment.

Written Comment 35, NRG

There are critical timing issues between the regulatory compliance deadlines and the Independent System Operator of New England (“ISO-NE”) Forward Capacity Market.

RCOSA section 22a-174-22e tries to align the draft regulation deadlines with the realities that the EGUs face – having to manage operating power generating stations in the ISO-NE energy, ancillary service, and capacity markets. However, due to the complexity of the market there are some areas where the draft regulation and the market construct do not dovetail. The following changes are recommended to address these concerns.

1. Subsection (g)(1) – Compliance plans are to be submitted by 9/1/2017 for Phase 1 and 9/1/2020 for Phase 2. Subsection (g)(8) requires that any compliance plan that requires a new or modified permit not start construction before the permit is obtained. Subsection (a) defines the Phase 1 start date as June 1, 2018 and Phase 2 start date as June 1, 2022. There is inadequate time between the regulation effective date, compliance plan submission and compliance deadline in each phase to obtain approval for the plan, seek a permit, and implement the compliance option. In Phase 1, there is only 9 months; in Phase 2 there is a more reasonable 21 months. Phase 1 compliance start should be shifted 21 months after the compliance plan submission deadline to 6/1/2019. All subsequent dates should be correspondingly adjusted according to this change in compliance start date.
2. Subsection (g)(2)(G) –The new regulation is anticipated to be effective January 1, 2017. This means that there is no regulatory certainty until the effective date. The

ISO-NE forward capacity auction has already been conducted and electric generating owners will already have obligations through May 31, 2021. Furthermore, the next opportunity to retire capacity in a capacity market auction will be in February 2017, for the period June 1, 2021 – May 31, 2022. The proposed compliance dates for Phase 1 of June 1, 2018 and for Phase 2 of June 1, 2022 are not well aligned with the forward capacity action timeline.

3. Subsection (h)(4) – replace May 1, 2028 with May 31, 2029 to align with the forward capacity market obligation which runs annually from June 1 – May 31. While NRG recognizes May 1 as the start of the ozone season, June 1 of each year is the start of a capacity commitment delivery period in ISO-NE’s Forward Capacity Market (FCM). Accordingly NRG requests the beginning of each compliance phase be aligned with the June 1 starting date for each capacity commitment delivery period under ISO-NE’s Forward Capacity Market. Second, Phase 2 begins on June 1, 2022 when some EGUs would need to install controls in order to be compliant. The ISO-NE capacity market allows environmental control upgrades to enter the market as new capacity. New capacity offers have the potential for costs associated with environmental capital in a unit’s bid to receive a price lock for up to 7 years. Extending the compliance window for one additional year would allow market participants to secure a 7 year price lock to ensure the economic viability of the compliance option. As currently written, the unit would need to retire in year 5 (at the 11 month mark).

DEEP’s Response to Written Comment 35, NRG

Given the already delayed compliance timeframe and staggered compliance phases that DEEP is providing, along with the regulatory language referenced in this response, DEEP should not revise the proposal in response to the commenter’s recommendations.

RCSA section 22a-174-22e’s compliance timeframe is already stretching the limits of the RACT compliance timeframe specified in the Implementation Rule for the 2008 ozone NAAQS (80 FR 12263; March 6, 2015). **Written Comment 22, EPA Region I** notes that controls adopted to meet RACT for the 2008 ozone NAAQS should be in effect and producing emission reductions by January 1, 2017. **Written Comment 22, EPA Region I** also requested that DEEP consider moving the Phase 2 compliance timeframe from 2022 to 2021 in light of the tightened 2015 ozone NAAQS. Furthermore, the regulatory adoption process in Connecticut under the Uniform Administrative Procedures Act¹⁵ is lengthy. DEEP cannot change or ignore that process to provide more “regulatory certainty” to the commenter.

The 2028 end date for compliance options corresponds to the moderate attainment deadline of a theoretical EPA update to the ozone NAAQS in 2020. Designations would be finalized in 2022, with six years to attain. Ideally, to get full benefit for the full, last ozone season for that NAAQS, expiration is May 1, the traditional start of the season for ozone control programs. DEEP is required to comply with EPA’s regulations and the provisions of the CAA. DEEP is under no obligation to adjust any regulation with regard to the ISO’s FCM schedule. Given the timeframe involved, NRG should be able to adjust its operations to comply with the proposed end to the compliance options in 2028.

¹⁵ Chapter 54 of the Connecticut General Statutes.

Furthermore, while NRG takes issue with the compliance options and case-by-case RACT provisions, those provisions are compliance alternatives added to enhance the flexibilities offered in the regulation. No owner or operator is required to make use of those options. DEEP understands that a number of owners/operators intend to take advantage of one or another of these options. DEEP declines to revise them to suit the commenter.

Written Comment 36, NRG

In the fiscal impact statements, DEEP has stated that if the proposal were finalized in its current form, there would be no fiscal impact to small businesses, municipalities or the state.

Unfortunately, this is simply not the case. RCSA section 22a-174-22e could have a detrimental impact to the State of Connecticut through any one of the following actions:

- a) The retirement of EGUs due to this regulation has the potential to increase costs to the people of Connecticut, including but not limited to the following ways:
 - i) There would be additional costs to procure new capacity when existing EGUs retire;
 - ii) Lack of fuel diversity could result in elevated winter energy prices, e.g. Polar Vortex, resulting in higher electric rates for consumers;
 - iii) There would likely be a direct economic impact to communities where existing generating plants are located due to the loss of local property taxes and the loss of jobs at those facilities if those EGUs retire; and
 - iv) There will be lower indirect spending associated with the community through the loss of employee and contractor revenue, local travel, and various construction trades often utilized within a community by EGUs.

DEEP's Response to Written Comment 36, NRG

DEEP rejects the assumptions underlying NRG's predictions of economic harm to Connecticut's citizens as a result of the proposal. First, all of NRG's stated harms arise from the assumed retirement of EGUs as a result of the proposal. DEEP questions the validity of that initial assumption. It is highly unlikely that any EGU owner or operator would find the adoption by the state of a RACT-based regulation to limit NOx emissions from fuel-burning equipment will result in the retirement of an EGU that is operating on sound financial and technical foundations. If the operation of an EGU is already on shaky ground because of the age, failure to invest in emission controls, uncompetitive cost of operation, fuel prices or other factors, the adoption of the proposal may add to the costs of operation. In a competitive energy and capacity market, many considerations determine those EGUs that operate at a profit compared to those that do not. Environmental regulations are only a small element of such considerations.

In addition, DEEP rejects the assumption underlying statement (a.i.) that "there will be additional costs to procure new capacity when existing EGUs retire" and that consequently, Connecticut citizens will end up paying such costs. As set out in the response to **Written Comment 34, NRG**, there is an abundant amount of new capacity, both recently constructed and scheduled to be operational by January 2018, a date prior to the initial compliance date of proposed RCSA section 22a-174-22e. Furthermore, Connecticut is actively pursuing efforts to secure new, cost-effective large- and small-scale clean energy resources. For example, in May 2016, DEEP received 107 proposals in response to a request for proposals (RFP) for new, small-scale energy projects, and the proposals include a wide range of technologies.

In addition, DEEP does not anticipate that the elevated winter prices predicted by NRG in (a.ii) are likely to occur. While the region did experience short-term shortfalls in natural gas supplies in January 2014, efforts occurring now are expected to result in adequate supplies by 2022 (see June 2, 2016 DEEP [Request for Proposals](#) For Natural Gas Capacity, Liquefied Natural Gas (LNG), And Natural Gas Storage).

While objecting to the assumption of retirement as a result of adoption of this proposal, DEEP points out, in response to NRG statements (a.iii) and (a.iv) that new EGU construction creates jobs. Furthermore, lower energy prices may result from the more efficient, lower cost operation of new EGUS compared to aged EGUs.

For the stated reasons, DEEP declines to revise the proposal in response to the comment.

Written Comment 37, NRG

The economic feasibility contemplated in the regulation does not meet the standard required for RACT. The ISO-NE forward capacity market provides a mechanism to indicate economic infeasibility

RACT is defined as “the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.” (44 FR 53762 (1979)).

RCSA section 22a-174-22e is attempting to redefine RACT by implementing a standard to define economic feasibility in a way that is neither defensible nor reasonable. NRG believes that the proposed \$/ton limit is too high and that the use of potential emissions rather than past actual emissions causes projects to appear more economically feasible than they are. Connecticut EGUs are largely part of the ISO-NE. The ISO-NE sends clear market signals about what is economically feasible and what is not. This built-in market construct is regulated and transparent and should be used to determine whether a control is economically feasible.

A brief primer on the energy market in Connecticut (ISO-NE)

In May 1999, ISO-NE launched the wholesale electricity market.¹⁶ The ISO-NE is the regional transmission operator¹⁷ for the State of Connecticut as well as: Maine, New Hampshire, Vermont, Massachusetts and Rhode Island. The ISO-NE currently¹⁸ includes over 350 generators representing 31,000 MW of capacity and provides a venue for over 400 buyers and sellers to transact over \$7 billion. The ISO-NE acts as a clearing house for buyers and sellers of wholesale electricity and the three key products that are bought and sold in the wholesale market:

- i) Energy – (i.e. commodity power)
- ii) Ancillary services (reliability services, such as grid restoration after blackouts)
- iii) Capacity (ensuring that there are enough units interconnected to the grid to meet the highest demand hours in the year)

¹⁶ “A Review of Electricity Industry Restructuring in New England, Polestar Communications & Strategic Analysis, September 2006”.

¹⁷ <http://www.ferc.gov/market-oversight/mkt-electric/new-england.asp>

¹⁸ “Today’s Grid” <http://www.iso-ne.com/about/what-we-do/history>

The ISO-NE is governed by the Federal Energy Regulatory Commission (“FERC”). Market rules are developed through the stakeholder process, presented to FERC for approval. FERC is the final authority in determining whether or not the tariff is just and reasonable.

As mentioned above, one of the markets cleared through the ISO-NE is the capacity market. In general, capacity markets are the vehicle that the ISO-NE uses to send signals to the market place that either more supply is required or too much supply is in place. The goal of the capacity market is to ensure that there is adequate long-term supply provided by EGUs to meet the long term demand for electricity. When supply is short, the signal is sent to the market to build new generation.

However, building and maintaining EGUs is capital intensive. New power generating projects have a very high risk of failure prior to commissioning. The development process consists of a myriad of high risk steps that must all be accomplished successfully in order to bring a new EGU online. These steps include the process to find a suitable location, to obtain all federal, state and local approvals, to obtain the required operating permits, to design and build the EGU, and to secure the funds to build a project costs hundreds of millions to billions of dollars.

In addition, since deregulation, the generating stations are no longer owned by vertically integrated utilities. Prior to deregulation, utilities could make a large capital investment and obtain a guaranteed rate of return through the rate base process. Today, companies that wish to develop new generation or invest in existing generation in the ISO-NE bear all of the risk of financial investment success or failure. Owners of electrical generation interconnected with the ISO-NE are not Utilities.

Background - ISO-NE’s Forward Capacity Market

The ISO-NE created a Forward Capacity Market (“FCM”) to alleviate some of the risk associated with the capital-intensive business of owning and investing in the power generation market, the long lead time to actually permit, build and commission a new electrical generating station, and the high capital investment required.

The FCM¹⁹ is designed to provide a market signal that alerts market participants (buyers and sellers of wholesale capacity) that there is either too much supply or too little supply to meet future demand. When there is too much supply, prices decline; too little, prices rise. FCM auctions take place once a year, but the capacity that is bought or sold is for 3 years in advance of the actual operating period.

The goal of the capacity market is to have a market construct that both buyers and suppliers can use to make accurate forecasts for the expected capacity price three years in advance of operations. Central to the FCM market is the Demand Curve. The sole purpose of the demand curve is to provide a transparent, set price so that buyers and suppliers can know with near certainty the price expected for capacity given different market fundamentals.

¹⁹ For additional information about how the forward capacity auction operates, see this link: <http://www.iso-ne.com/markets-operations/markets/forward-capacity-market/fcm-participation-guide/about-the-fcm-and-its-auctions>

In addition, the ISO-NE has adopted a novel “7 year price lock” – which means that suppliers can sell their capacity at the auction clearing price for up to 7 years. The benefit of the 7 year lock for a company assessing the economic viability of a project is that it provides revenue certainty for 7 years if the capacity competes successfully in the auction.

Finally, the capacity market is *highly competitive*. Electricity is a unique commodity in that it cannot be easily stored. Most other commodities – like oil, grain, and even oranges can be stored for future use. For example, it is simply not possible to build a new generating station overnight on July 15th to meet a new peak summer load expected on July 16th, for example. The solution to this conundrum is to encourage the grid to have more capacity in reserves in the event that there is an unexpected weather event that causes demand to spike.

The natural state of the capacity market is to be in a state of “over-supply” as some additional margin of reserve is required by ISO-NE. This is not to say that prices always remain low, when there is a surprise increase in the economic growth or a surprise retirement of a large generating station, prices will spike - this will attract new investment and the prices will eventually revert to the mean condition.

ISO-NE capacity market and its relevance to the new proposed Section 22e

The capacity market, by design, will provide an economic signal of whether or not any investment in electric generation is economically feasible. The market consists of over 400 buyers and sellers, their interaction sets the price. Due to the competitive nature of the industry, and due to the regulatory oversight of the market, generation owners have an incentive to bid any new or incremental investment as close to their cost plus a small amount of profit. If an owner bids its capacity too high, the owner may not get any capacity revenue at all so the market itself establishes the framework for maintaining prices and proper controls

How would this work for a new environmental investment in Connecticut?

The ISO-NE has provisions to allow the addition of new environmental controls to existing generators that have significant incremental costs to qualify as “new” capacity. The generation owner seeks to qualify this “new” capacity from the ISO well in advance of the auction. The generation owner prepares a package of information to the ISO. The ISO’s market monitor reviews the information and approves the lowest possible cost that the generating owner can participate in the auction. For environmental controls, the ISO sets an annual minimum price in \$/kW. For the next Forward Capacity Auction (FCA11), scheduled for February 2017, the investment threshold is \$154/kW. By way of specific example, for a 100 MW generating station, the capital investment would need to be at least \$15,400,000 to qualify as a new environmental upgrade.

Once qualified, the electric generating station and its proposed new controls can participate in the competitive capacity auction. The generation owner would offer to provide capacity to the market at a price that allows it to recoup the basic cost of its operations and the environmental investment made.

In the most recent auction, NRG considered the economic feasibility of installing Selective Catalytic Reduction (“SCR”) controls for our fleet of steam units (Middletown 2, 3, 4 and Montville 5 and 6). The ISO provides a minimum price to participate in the auction. The auction occurred in February and cleared at a price of \$7.03/kW-month. Based on the SCR costs in

Appendix 1 of the draft SIP this price would not have been sufficient to support the cost of adding SCRs to these units.

In short – the ISO-NE capacity market offers a very transparent mechanism to determine whether an environmental control is economic. In this case, the SCRs would not have been economic.

NRG’s Recommendation:

The Case by Case RACT economic feasibility should include the results of the ISO-NE capacity market as an additional test of economic feasibility. Environmental controls shall be deemed economically infeasible if they are offered into the ISO-NE after qualifying as new capacity under the environmental control and they do not clear the auction.

- Bidding and not clearing allows unit to utilize a Case by Case RACT determination*
- Bidding and clearing allows unit to stay beyond 2028*

DEEP’s Response to Written Comment 37, NRG

DEEP declines to act on NRG’s recommendations as presented in Comment 37.

NRG objects to the \$/ton limit that is assigned to determine the economic feasibility of NOx pollution controls for an owner or operator applying for a case-by-case RACT determination (subsection (h)) from the commissioner. The \$/ton limit defined in that instance does not apply to any other aspect of the regulation. A case-by-case RACT determination is a means of compliance with the regulation provided only for equipment for which the owner is able to make a demonstration that it is not technically or economically feasible to control NOx emissions from an existing regulated emission unit. DEEP expects that there will be very few applications for such an option. The option assumes that an emission unit for which the owner is applying for a case-by-case RACT determination operates at all times (8760 hours per year, which is termed the “potential emissions”), unless the emission unit is subject to an enforceable restriction on operating hours. So, an emission unit that is permitted to only operate for a certain number of hours per year may use such a restriction in determining the economic feasibility of NOx pollution controls, thereby increasing the calculated \$/ton value to control the emission unit. NRG desires to use historical actual emissions, which are typically less than 8760 hours per year, to determine the costs of NOx controls. Should NRG wish to apply for a case-by-case RACT determination for an emission unit, NRG may indeed use the historical actual emissions, *if NRG is willing to accept an enforceable restriction on emissions* for such unit to the level of the historical actual emissions.

DEEP declines to use an aspect of ISO-NE’s auction process, which is designed to ensure that the New England power system will have sufficient resources to meet future demand for electricity, as the measure of whether or not it is reasonable to control NOx emissions from a particular emission unit in Connecticut to meet RACT requirements under the 2008 ozone NAAQS. There is insufficient nexus between the purposes to provide a basis for using one method of calculation as a surrogate for another. The method recommended by DEEP for calculating costs for RACT is based on EPA methods for determining the costs of post-combustion control equipment.

Finally, DEEP declines to perpetuate the continued operation of old, high emission rate emission units after 2028. By including a state emission credit trading program in DEEP’s current NOx RACT regulation (RCSA section 22a-174-22), DEEP has since 1994 allowed the operation of

emission units that are not controlled to a RACT level. Continued operation of such emission units is harmful to air quality, limits our ability to attain the ozone NAAQS and does not comply with EPA’s RACT mandates. The proposed end of the case-by-case RACT determinations in 2028 puts an end to this failure. Owners and operators of such old, high emitting emission units are provided more than adequate time – until April 30, 2028 -- to make decisions about the disposition of such emission units under RCSA section 22a-174-22e.

Written Comment 38, NRG

The economic feasibility contemplated in the regulation does not meet the standard required for RACT - The application of the Case by Case RACT method as proposed is flawed
DEEP is recommending to apply a methodology to determine economic feasibility of controls based on the \$/ton removed. The application of this methodology is flawed for several reasons as detailed below.

The generation owner must demonstrate that the environmental control is economically infeasible. Infeasibility is determined by comparing a threshold to the cost of the environmental control under consideration. If the cost of the environmental control is higher than the amounts listed in Section (h)(1)(iii) the project is considered economically infeasible. In Phase 1, the pollution control system feasibility threshold is \$13,118/ton and in Phase 2 it is \$13,654/ton. NRG believes both of these thresholds are too high.

Table 2 demonstrates the implied annual investment threshold that would be required under the Case by Case RACT of the proposed regulation. The calculation is performed for a theoretical 500 MW unit with a heat rate of 10 MMBtu/MWh and heat input of 5,000 MMBtu/hour. The theoretical unit is assumed to have an uncontrolled emission rate of 0.3 lb/MMBtu and is evaluating adding an SCR as a potential control option which would reduce the emission rate to 0.1 lb/MMBtu. Given the heat rate of 10 MMBtu/MWh this theoretical unit would be a peaking unit in the current ISO-NE market and would experience an actual capacity factor close to 1%. The unit would have an annual actual emission of close to 43.8 tons. By applying the 43.8 tons and multiplying by \$13,654/ton, the proposed Phase 2 threshold in Section (h)(1)(iii), the annual investment threshold is \$598,045. However, the regulation requires that the theoretic unit be evaluated as if it were a unit with a 100% capacity factor. This means that a theoretical peaking unit, which only produces 43.8 tons per year, would be evaluated as if it produced 4,380 tons per year. The *annual investment* deemed to be economically feasible is \$59,804,520. Over a ten year period, this would be \$598,804,520. There are no units that operate every hour of the year. Therefore, the proposed use of 8,760 hours for these peaking units in the calculation of cost effectiveness is wholly inappropriate and seriously biases the economic feasibility analysis. A more “reasonable” RACT approach would be to use past actual annual emissions.

Table 2 - Implied Annual Investment at different capacity factors

Item	Key Input	UOM	Peaking	Mid Merit	Baseload
A	Annual Capacity Factor	%	1%	50%	100%
B	Heat Input [O x P]	MMBtu/hour	5,000	5,000	5,000
C	Controlled Emission Rate	lb/MMBtu	0.1	0.1	0.1
D	Uncontrolled Emission Rate	lb/MMBtu	0.3	0.3	0.3
E	Hours of Operation [K x A]	Hours/year	87.6	4380	8760
F	Avoided lbs/year [A x (C-B) x E]	Lb/year	87600	4380000	8760000

G	Avoided tons/year [F /M]	Tons/year		43.8		2190		4380
H	Phase 2 Threshold (1)(h)(1)(iii)	\$/ton	\$	13,654	\$	13,654	\$	13,654
I	Implied Annual Investment [H x G]	\$/year	\$	598,045	\$	29,902,260	\$	59,804,520

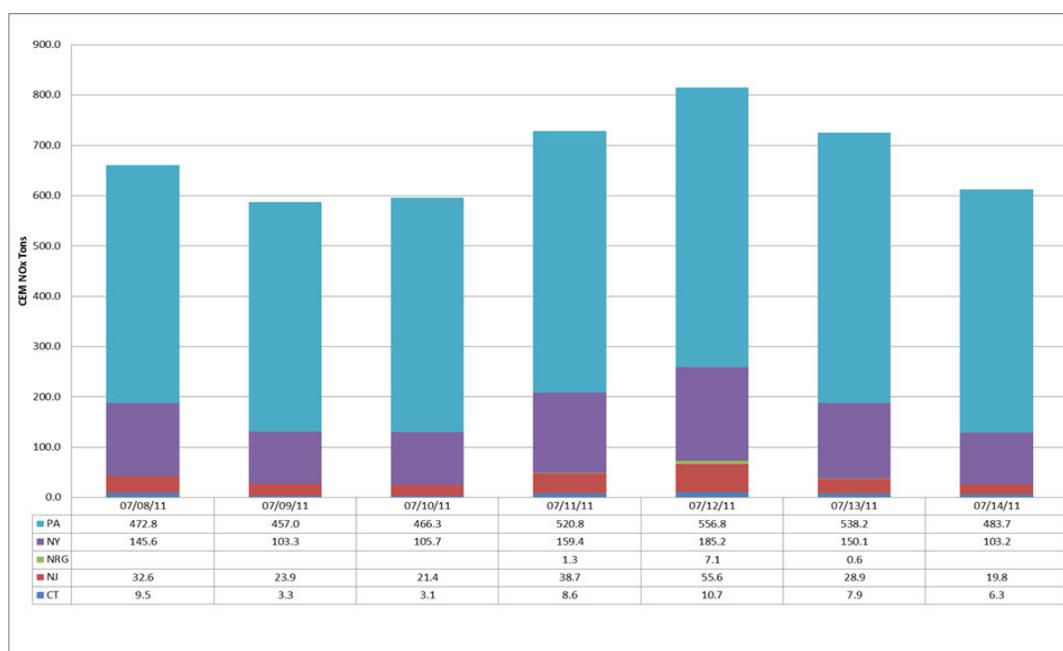
Common Inputs

L	Hours per year	Hours		8,760
M	Phase 2 Proposed Threshold	\$/Ton	\$	13,654
N	lb per ton	conversion		2000
O	Unit Capability	MW		500
P	Unit Heat Rate	MMBtu/MWh		10

UOM - Unit of Measurement

Additionally, in support of this, as can be seen in Figure 2 and from the Alpine Geophysics modeling analysis²⁰, the seasonal and HEDD daily impacts from NRG EGUs to Connecticut monitors are insignificant. Even if we were to remove all the EGUs emissions from the system there would be no impact on the state's ozone attainment status. Therefore, NRG believes that potential hours should be replaced with actual hours in the case-by-case RACT determination.

Figure 2 - July 11, 2011 CEM NOx emission comparison by contributing State (with NRG CT breakout).



Finally, on October 30, 2015, PSE&G provided comments²¹ which contained a strong and sensible case supporting the use of actual emissions instead of 8760 hour potential emissions when determining pollution control system cost effectiveness. NRG agrees with the comments

²⁰ "Impact Analysis of NRG High Energy Demand Day (HEDD) Control on Connecticut Monitor Ozone Concentrations", Prepared by Alpine Geophysics, LLC, June 2016, submitted as Appendix A (Alpine Report).

²¹ "NOx RACT cost-Effectiveness Calculation Guidance from EPA and other OTR States", PSE&G, email sent Friday October 30, 2015. http://www.ct.gov/deep/lib/deep/air/regulations/nox_ract_cost-effectiveness_calculation_guidance_pscg_comment/pdf

with regard to potential emissions calculations made by PSE&G and posted on the CTDEEP website on October 30, 2015.

Comparing Case by Case, Implied Economic Feasibility to ISO-NE FCM

The same theoretical 500 Mw unit in Table 2 of the comment, at \$13,654/ton removed over 10 years would imply a total investment of \$598 million or \$1,196/kW would be economically feasible under the proposed RACT methodology but is nearly 10x the ISO-NE minimum threshold for a new environmental control to qualify as a new capacity resource. The cost of implementing controls would be equivalent to and is on par with the cost of building a brand new electric generating station. It does not seem reasonable that such an impact is the intended consequence of the regulation.

NRG's Recommendation:

The Case by Case RACT threshold \$/ton should use actual annual emissions (not potential emissions) and not require an operating hour restriction as currently proposed in the draft regulation and the \$/ton threshold should be reduced to \$5,885/ton to be consistent with the NY DEC Air Guide 20 regulation. This value is represented in Table 3 below and is based on the \$5,000/ton 2011 dollars escalated to 2022 dollars at 2.3%.

Table 3 - Table 2 Revised to \$5,885/ton²² threshold

Item	Key Input	UOM	Peaking	Mid Merit	Baseload
A	Annual Capacity Factor	%	1%	50%	100%
B	Heat Input [O x P]	MMBtu/hour	5,000	5,000	5,000
C	Controlled Emission Rate	lb/MMBtu	0.1	0.1	0.1
D	Uncontrolled Emission Rate	lb/MMBtu	0.3	0.3	0.3
E	Hours of Operation [K x A]	Hours/year	87.6	4380	8760
F	Avoided lbs/year [A x (C-B) x E]	Lb/year	87600	4380000	8760000
G	Avoided tons/year [F / M]	Tons/year	43.8	2190	4380
H	Phase 2 Threshold (1)(h)(1)(iii)	\$/ton	\$ 5,885	\$ 5,885	\$ 5,885
I	Implied Annual Investment [H x G]	\$/year	\$ 257,784	\$ 12,889,199	\$ 25,778,399
Common Inputs					
L	Hours per year	Hours	8,760		
M	Phase 2 Proposed Threshold	\$/Ton	\$ 13,654		
N	lb per ton	conversion	2000		
O	Unit Capability	MW	500		
P	Unit Heat Rate	MMBtu/MWh	10		

UOM - Unit of Measurement

Investment	\$ 257,783,988		
\$/kW	515.5679766		

DEEP's Response to Written Comment 38, NRG

As stated in DEEP's Response to Written Comment 37, NRG, should NRG wish to apply for a case-by-case RACT determination for an emission unit, NRG may indeed use the historical actual emissions, if NRG is willing to accept an enforceable restriction on emissions for such

²² Air Guide 20 states that NYSDEC can make a favorable determination that an economic variance is appropriate if the cost per ton for the control of NOx is greater than \$3000 in 1994. Based on the federal Bureau of Labor Statistics, this cost equates to \$4,583 in 2011 dollars. From 2011\$ to 2022\$ an escalation rate of 2.3% was applied.

unit to the level of the historical actual emissions. A source owner may not have it both ways – if an owner is not willing to take a restriction on operating hours for a particular emission unit, it must use the unrestricted operating hours of the emission unit as the basis for its \$/ton calculation.

DEEP is aware of the cost threshold designated by NYDEC and chose not to adopt the same threshold because it does not represent the actual costs to control emission units in Connecticut, based on information gained in developing New Source Review permits for emission units.

See also **Written Comment 29, Sierra Club** and DEEP's response thereto.

Written Comment 39, NRG

Subsection (d)(2)(D): Please include details in this section describing how a dual-fuel unit meets this seasonal average.

DEEP's Response to Written Comment 39, NRG

DEEP agrees that subsection (d) of RCSA section 22a-174-22e could more clearly describe how the owner of a dual-fuel emission unit determines its emission rate for comparison with the emission limit, for which the calculation is described in subsection (d)(10). The following two subdivisions should be added to subsection (d) of RCSA section 22a-174-22e:

(19) An owner or operator shall calculate an emission unit's non-ozone season emission rate as the sum of the emission unit's NO_x emissions during the period from October 1 through April 30, inclusive, divided by the sum of the emission unit's heat input during the period from October 1 through April 30, inclusive.

(20) An owner or operator shall calculate an emission unit's ozone season emission rate as the sum of the emission unit's NO_x emissions while firing a particular fuel during the period from May 1 through September 30, inclusive, divided by the sum of the emission unit's heat input while firing that particular fuel during the period from May 1 through September 30, inclusive.

Written Comment 40, NRG

Subsection (d)(4)(C): This section is confusing, with section (C) defining the emissions limitations, and section (D) defining the non-ozone season emission limitations. It appears that there is no ozone season average emission limit, and that the daily block average applies. Please clarify this section.

DEEP's Response to Written Comment 40, NRG

Upon reviewing the language, DEEP does not agree that clarification is needed.

RCSA section 22a-174-22e(d)(4)(C) sets out the Phase 2 daily block average emissions limitation for simple cycle combustion turbines and RCSA section 22a-174-22e(d)(4)(D) sets out the Phase 2 non-ozone season emissions limitation for simple cycle combustion turbines that are also affected units (defined in RCSA section 22a-174-22e(a)(1)). There is no separate Phase 2 ozone season emissions limitation for simple cycle combustion turbines. The Phase 2 daily block average emissions limitation is sufficient in itself. Both the Phase 2 daily block average

emissions limitation in RCSA section 22a-174-22e(d)(4)(C) and the Phase 2 non-ozone season emissions limitation in RCSA section 22a-174-22e(d)(4)(D) apply to simple cycle combustion turbines that are also affected units.

Written Comment 41, NRG

Subsection (d)(6)(A): reciprocating engine emission limits. The “other oil” fired limit of 8.0 g/bk hp-hr is too low for phase 1. This limit should be 9.0 g/bk hp-hr, which is the limit that other States, such as Massachusetts, uses. This limit reflects a reasonable goal for a well-tuned and maintained reciprocating engine without any post-combustion NOx controls installed.

DEEP’s Response to Written Comment 41, NRG

DEEP should not revise the Phase 1 “other oil-fired” reciprocating engine emissions limitation from 8 gm/bk hp-hr to 9.0 gm/bk hp-hr. DEEP’s existing “other oil-fired” reciprocating engine emissions limitation is 8 gm/bk hp-hr, and has been so since 1995. Making the emissions limitation less stringent than the existing emissions limitation would be considered backsliding, which is inconsistent with Section 110(l) of the CAA. Furthermore, such a limit is not a RACT level of control. Since March 7, 2007, NJ’s emissions limitations have been 1.5 and 2.3 grams per bhp-hr, respectively, for rich-burn and lean-burn reciprocating engines fueled by liquid fuel. Since July 8, 2010, NY’s emissions limitation for internal combustion engines fired with distillate oil has been 2.3 gm/bk hp-hr. Accordingly, DEEP has proposed Phase 2 emission limits of 1.5 and 2.3 gm/bk hp-hr for rich-burn and lean-burn reciprocating engines fueled by distillate oil.

Written Comment 42, NRG

Subsection (d)(4)(D): if the daily block average defined in section (2)(C) applies, please state that in this section.

DEEP’s Response to Written Comment 42, NRG

See DEEP’s Response to **Written Comment 40, NRG**.

Written Comment 43, NRG

Subsection (d)(11)(C): This section refers to compliance with a daily block average and references section (m)(3). Section (m)(3) states that emissions data shall not include periods of time when the unit is not operating. Does this mean that the “daily block average” is really an average of the time during which the unit is running – even if it is less than 24 hours? Using the “0” emission rate for the time within the 24-hour block that the unit was not firing is an important piece of the daily block average compliance equation, as it relates to peaking units.

DEEP’s Response to Written Comment 43, NRG

Yes, the “daily block average” is really an average of the time during which the unit is running – even if it is less than 24 hours. Using a “0” emission rate for the time within the 24-hour block that the unit was not operating artificially lowers the emission rate of the unit when it actually was operating. DEEP should not revise the proposal as a result of the comment.

Written Comment 44, NRG

Subsection (g)(2)(C): This section allows the use of existing, banked DERs to comply with the applicable emissions limitations. Phase 1 should allow the production of DERs. The trading

orders should be extended through Phase 1 with provisions for both production and consumption of DERCs, with consideration being taken for the new Phase 1 emissions limits.

DEEP's Response to Written Comment 44, NRG

Given the Phase 1 ozone season limits, DEEP does not believe that emission units would be able to generate a quantity of DERCs sufficient to justify the resources to support continuation of the DERC generation component of the NOx Trading Agreements and Orders. DEEP views this more limited Phase 1 DERC trading program, absent new generation of DERCs, as an appropriate manner to bring the use of DERCs to an end while allowing holders of DERCs to use the currency in which they have invested. DEEP is puzzled that the commenter provides this comment since the commenter previously indicated that it would not be able to generate DERCs at DEEP's proposed Phase 1 ozone season limits.²³ For the reasons stated, DEEP should not allow the generation of new DERCs during Phase 1 of RCSA section 22a-174-22e.

Regarding the commenter's recommendation to extend the Trading Agreements and Orders, please see DEEP's Responses to **Written Comments 31 and 32, MIRA**.

Written Comment 45, NRG

Subsection (g)(2)(D): This section describes an enforceable cap on NOx tons emitted. Current wording states, "The enforceable cap shall achieve the lower of a 40% reduction in subject emission unit 2014 allowable emissions or the average of the actual emissions for the two nonoverlapping consecutive 12-month periods between January 1, 2014 and March 1, 2017...". In order for this to be a viable compliance option, this wording must be changed to: "The enforceable cap shall achieve **either** a 40% reduction in subject emission unit 2014 allowable emissions or the average of the actual emissions for the two non-overlapping consecutive 12-month periods between January 1, 2014 and March 1, 2017...".

Written Comment 46, NRG

Subsection (g)(2)(E): this section should be revised as above, allowing either a 40% reduction in allowable 2019 emissions or the actual emissions between June 1, 2018 and March 1, 2020.

DEEP's Response to Written Comments 45 and 46, NRG

DEEP declines NRG's request to modify the two compliance options concerning a 40% reduction in emissions for boilers serving EGUs. DEEP designed the option to be the *lower* of a 40% reduction in allowable emissions or the average of a certain period of actual emissions to make the compliance option meaningful even for emission units that operate few hours per year yet have allowable emissions that assume operation throughout the year, as if the boiler operated as a baseload unit. DEEP is able to offer the compliance flexibility provided by the compliance options because DEEP considers the compliance options to be environmentally equivalent to the result obtained from compliance with the emission limits. NRG's suggestion would result in a reduction on paper in allowable emissions. However, that "reduction" will not result in any actual reduction in NOx emissions for emission units that function as peak load units, undermining the conceptual basis for the compliance option.

²³ See NRG comments on the CT DEEP draft new Section 22, October 9, 2015. Available at http://www.ct.gov/deep/lib/deep/air/regulations/nrg_comments_20151009.pdf

Written Comment 47, NRG

Subsection (g)(4)(A) and (g)(4)(B): NRG requests more specific language stating that “...installing and operating water injection on a simple-cycle combustion turbine is RACT.” While NRG does not disagree that the system shall be designed to comply with the referenced limits, experience has shown that often there is a discrepancy between design and as built performance. With no other emission reduction technology reasonably available – both technically and economically, water injection must be considered RACT. Without stating this very clearly in the regulation, NRG may well be forced to submit an alternate RACT limit proposal for all of the simple cycle turbines, as there is no technology available to mitigate NOx at a cost anywhere near the \$13,635/ton referenced in section(h)(1)(A)(iii). Please see the proposed revisions below:

(A) To satisfy the **ozone and** non-ozone season emission limitations in subsections (d)(4)(B) and (d)(4)(D) of this section, install and operate water injection technology. Water injection technology, **which is considered RACT for simple cycle turbines**, shall be operated at all times the simple cycle combustion turbine is operating, and the water-to-fuel ratio shall be continuously monitored. The water-to-fuel ratio that is acceptable during operation shall be established during the initial performance test, or, if the emission unit has a CEM system, during the initial relative accuracy test audit.

Additionally, **sections (d)(4)(B) and (d)(4)(D)** could be annotated stating that installation and operation of a water injection system is considered RACT for simple cycle turbines.

DEEP’s Response to Written Comment 47, NRG

DEEP should not revise the proposed language in response to the comment.

Other states in the region (New Jersey, Delaware, New York), have adopted NOx emission limits for simple-cycle turbines that are similar to the limits proposed by DEEP for the ozone season in Phase 1 and the 24-hour limits in Phase 2. DEEP is not aware of any technological or economic consideration suggesting that such emission limits do not represent RACT in Connecticut.

DEEP reminds the commenter that the commenter’s wholly owned subsidiary, Connecticut Jet Power LLC, installed two permitted simple cycle combustion turbines controlled by water injection, and installed water injection to control NOx emissions on the three existing similar registered simple cycle combustion turbines at the Cos Cob facility in 2008. The permit limits for the two simple cycle combustion turbines with water injection are equivalent to the Phase 1 ozone season limit for other oil-fired simple cycle combustion turbines in RCSA section 22a-174-22e(d)(4)(B) and the Phase 2 daily block average emissions limitations for gas and other oil-fired simple cycle combustion turbines in RCSA section 22a-174-22e(d)(4)(C). Stack test results from the two permitted turbines demonstrate that the NOx emissions from these turbines are below the permit limits. Therefore, we conclude that an emission unit that is the same make and model as the turbines at the Cos Cob facility that is controlled with water injection should be able to operate in compliance with the proposed ozone season emission limitation.

Written Comment 48, NRG

Subsection (g)(4): Simple cycle combustion turbine compliance options. Given the low runtime and very low impact on the ambient air quality the DEEP should consider an additional

compliance option. This option should offer a permitted runtime or NOx emissions tonnage limit.

DEEP's Response to Written Comment 48, NRG

DEEP should not revise the proposal in response to the comment. A significant benefit achieved by the adoption of this proposal will be an end to the current state under RCSA section 22a-174-22. The outdated emission standards and trading program perpetuate the continued operation of high NOx emitting emission units that have never operated in compliance with the emission standards in the existing rule. Many simple cycle combustion turbines are in this category of emission units.

Furthermore, DEEP does not agree with NRG's assertion that such emission units have a low impact on air quality. Such emission units often operate on the hottest days in summer when ozone exceedances occur and such additional NOx emissions are particularly harmful.

Given the age (43-61 years old by 2028) of the mostly unpermitted, uncontrolled simple cycle combustion turbine fleet in Connecticut, along with the very high NOx emission rates from these same units on the worst ozone air quality days (about 9.35 lbs NOx/MWh for the old, aero-derivative simple cycle combustion turbines compared with 0.24 lbNOx/MWh for a new simple cycle combustion turbine or 1.45 lbs NOx/MWh for a coal-fired boiler serving an EGU), DEEP does not believe it is in the interest of clean air to offer the compliance option recommended in the comment. A seasonal or annual limit on NOx emissions or unit operating time would not address the concern raised by the high NOx emission rates of the uncontrolled simple cycle combustion turbines on ozone season days. .

Written Comment 49, NRG

Subsection (a)

1. NRG is disappointed with the removal of the startup and shutdown provisions in a previous version, as they would have allowed the commenter considerable compliance flexibility. For EGUs that serve a peaking function, the startup and shutdown time can be a significant portion of a 24-hour averaging period. Therefore, EGUs that provide a peaking function should be allowed a longer averaging period to take into consideration this operation. The following shutdown and startup definitions from February 2015 should be included in the final regulation:

Shutdown means the period in which cessation of operation of an EGU is initiated for any purpose. Shutdown begins when the EGU no longer generates electricity or makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes or when no coal, liquid oil, syngas, or solid oil-derived fuel is being fired in the EGU, whichever is earlier. Shutdown ends when the EGU no longer generates electricity or makes useful thermal energy (such as steam or heat) for industrial, commercial, heating, or cooling purposes, and no fuel is being fired in the EGU. Any fraction of an hour in which shutdown occurs constitutes a full hour of shutdown.

Startup means:

(1) Either the first-ever firing of fuel in a boiler for the purpose of producing electricity, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including on-site use). Any fraction of an hour in which startup occurs constitutes a full hour of startup; or

(2) The period in which operation of an EGU is initiated for any purpose. Startup begins with either the firing of any fuel in an EGU for the purpose of producing electricity or useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes (other than the first-ever firing of fuel in a boiler following construction of the boiler) or for any other purpose after a shutdown event. Startup ends 4 hours after the EGU generates electricity that is sold or used for any other purpose (including on site use), or 4 hours after the EGU makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes (16 U.S.C. 796(18)(A) and 18 CFR 292.202(c)), whichever is earlier. Any fraction of an hour in which startup occurs constitutes a full hour of startup.

DEEP's Response to Written Comment 49, NRG

At the April 29, 2015 SIPRAC subcommittee meeting, a number of commenters expressed concerns about the definitions of startup and shutdown.²⁴ Subsequently, on May 22, 2015, the EPA Administrator signed a final action concerning EPA's startup and shutdown policy, which was published in the Federal Register on June 12, 2015.²⁵ As DEEP explained at the June 11, 2015 RCSA section 22a-174-22e/22f subcommittee meeting,²⁶ DEEP did not believe that it was prudent to continue to include the startup/shutdown provisions in RCSA section 22a-174-22e given EPA's restatement and update of its startup/shutdown/malfunction policy. Thus, DEEP declines to include the startup and shutdown provisions as recommended in the comment.

Written Comment 50, NRG

In subsection (g)(3)(F) DEEP has cited 40 CFR 63 Subpart DDDDD and allowed compliance with this regulation as an alternative to meeting the specific NO_x emissions limits in these proposed regulations. NRG agrees with this approach and would like DEEP to consider a similar approach with the boilers serving EGU's. 40 CFR 63 Subpart UUUUU allows exemptions for "limited use" boilers. This NO_x regulation should follow the lead the EPA has taken in 40 CFR 63 Subpart UUUUU and allow exemptions to this regulation for limited use boilers.

This would be included as a compliance option for boilers serving an EGU in subsection (g)(2) as follows: "For a utility boiler subject to 40 CFR Subpart UUUUU, operate as a natural gas fired electric utility steam generating unit as defined in 40 CFR 63.10042."

²⁴ See the April 29, 2015 meeting notes at:

<http://www.ct.gov/deep/lib/deep/air/regulations/April292015MeetingNotes.pdf>

²⁵ <https://www.federalregister.gov/articles/2015/06/12/2015-12905/state-implementation-plans-response-to-petition-for-rulemaking-restatement-and-update-of-epas-ssm>

²⁶ <http://www.ct.gov/deep/lib/deep/air/regulations/Sec22TNGJune112015.pdf>

DEEP's Response to Written Comment 50, NRG

DEEP is providing several compliance options for boilers serving EGUs, including accepting an enforceable cap on mass emissions or hours of operation. As much of the environmental benefit of the proposal arises from the compliance of the boilers serving EGUs with the emission limits or meaningful compliance options, DEEP should not revise the proposal in response to the comment.

Written Comment 51, NRG

In the absence of the ability to produce DERCs through Phase 1, NRG would like to have the option to use existing NO_x allowances or some other accepted NO_x currency for compliance purposes while preparations are made to comply with Phase 2.

The compliance option in subsection (g)(2)(C) would thus read, "For a phase 1 emission limitation, use existing, banked NO_x DERCs or existing, banked NO_x Allowances to comply with the applicable emissions limitations..."

DEEP's Response to Written Comment 51, NRG

DEEP eliminated the use of NO_x allowances in the last round of NO_x Trading Agreement and Order extensions due to concerns about the dilution of environmental benefit from the use of out-of-state allowances for RACT compliance purposes. DEEP's concern regarding the use of NO_x allowances for RACT compliance purposes has not been alleviated. DEEP should not revise the proposal as suggested in the comment.

Written Comment 52, NRG

Section (h)(1)(A): For the purposes of this subsection, an EGU may elect to include as part of their support of economic infeasibility proof that a control technology is uneconomic in the ISO-NE forward capacity auction.

DEEP's Response to Written Comment 52, NRG

See DEEP's Response to **Written Comment 38, NRG**. DEEP should not revise the proposal as a result of the comment.

Written Comment 53, David Redalieu

RCSA section 22a-174-22f(g)(2)(B) calculation of daily NO_x emissions requires a "calculation of NO_x emissions on each day of operation, performed no later than the second day of each month for every day of operation in the preceding month." For many businesses, this may prove to be difficult to achieve with a high level of quality within this timeframe. For example at the commenter's facility, the collection of the data used to calculate emissions from emissions units generally takes the first five business days of the month to complete. Data entry and quality review of the data may take several more days. The commenter asks the DEEP to consider extending this calculation deadline in order to allow at least 30 days for the calculation of NO_x emissions. A record creation requirement for non-major sources of NO_x that is aligned with the requirement found in the General Permit to Limit the Potential to Emit (GPLPE), would be more efficient, less burdensome, and improve the quality of the data. The GPLPE requirement is as follows: "Monthly and consecutive 12 month records required by this general permit shall be created no later than 45 days after the end of each month or consecutive 12 month period".

DEEP's Response to Written Comment 53, David Redalieu

See DEEP's Response to **Written Comment 2, Ronald Schroeder.**

Oral Comment 1, Robert Silvestri

The commenter expressed appreciation for the open stakeholder process for the past two years.

DEEP's Response to Oral Comment 1, Robert Silvestri

DEEP appreciated the quality of stakeholder input throughout the regulation development process.

Oral Comment 2, Robert Silvestri

This comment is indirectly related to the compliance option allowing the use of discrete emission reduction credits. The Trading Agreements and Orders are set to expire in 2017 and this regulation starts in 2018 so we want to make sure that this is indeed a compliance option.

DEEP's Response to Oral Comment 2, Robert Silvestri

See DEEP's Response to **Written Comments 31 and 32, MIRA.**

Oral Comment 3, Christopher Shepard

See **Written Comments 31 and 32, MIRA.**

DEEP's Response to Oral Comment 3, Christopher Shepard

See DEEP's Response to **Written Comments 31 and 32, MIRA.**

V. Comments of Hearing Officers

The hearing officers have the following additional comments and revisions to the proposal:

- The hearing officers recommend the following additional revision to RCSA section 22a-174-22e(c)(5)(E) for consistency with RCSA section 22a-174-22f(d)(3), as follows:
 - (5) Emergency engines are exempt from the following requirements of this section:
 - (A) The emissions limitations of subsection (d)(6);
 - (B) The tune-up requirements of subsection (i);
 - (C) The testing requirements of subsection (l);
 - (D) The monitoring requirements of subsection (m); and
 - (E) If an owner or operator operates a **model year 2013 or later** an emergency engine in compliance with the ~~Tier 4~~ NOx emissions standards of 40 CFR 1039, Subpart B ~~for model year 2013 or later~~, such engine is exempt from the restriction of subsection (d)(14) of this section.

Note that the removal of "Tier 4" originates in **Written Comment 5, CBIA.**

- In several locations in subsection (g) of proposed RCSA section 22a-174-22e, the section refers to “the date of proposal of this section” with the intention that the actual date of proposal should be substituted for the phrase. The notice of intent for this proposal was posted on the eRegulations system on 3 May 2016. May 3, 2016 should be substituted for “[*date of proposal of this section*]” in the following locations in subsection (g) of proposed RCSA section 22a-174-22e: (g)(2)(G), (g)(3)(G), (g)(4)(F), (g)(5)(C), and (g)(6)(E).

VI. Conclusion

Based upon the comments addressed in this Comment and Response Document, we recommend the proposal be revised as recommended herein and submitted by the commissioner for approval by the Attorney General and the Legislative Regulations Review Committee and upon adoption, be submitted to the EPA as a SIP revision.

/s/Merrily A. Gere
Merrily Gere, Hearing Officer

4 August 2016
Date

/s/ Wendy Jacobs
Wendy Jacobs, Hearing Officer

4 August 2016
Date