



Connecticut Clean Air Mercury Rule State Plan

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Connecticut Department of Environmental Protection
Bureau of Air Management
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I. INTRODUCTION

On May 18, 2005, the U.S. Environmental Protection Agency (EPA) promulgated a final rule establishing standards of performance under Section 111 of the Clean Air Act (CAA) for mercury emissions from coal-fired electric generating units (EGUs). *Standards of Performance for New and Existing Stationary Sources; Electric Utility Steam Generating Units*, 70 FR 28606 (CAMR). CAMR establishes requirements by which mercury emissions from new and existing coal-fired EGUs are capped at specified, nation-wide levels in two phases. A first phase (Phase 1) cap of 38 tons per year applies in 2010, and a second phase (Phase 2) cap of 15 tons per year applies in 2018. EPA apportions each national cap by assigning to each state annual mercury emissions budgets. For Connecticut, these budgets are 0.053 tons, or 106 pounds, per year of allowable mercury emissions in 2010-2017 and 0.021 tons, or 42 pounds, per year in 2018 and beyond.

CAMR also provides for an optional market-based mercury cap-and-trade program. A state may meet its state budget by either joining the federal cap-and-trade program or by demonstrating that the mercury emissions from the CAMR units in the state will not exceed the state budget in any given year. For states that choose not to participate in the trading program, the budget assigned under CAMR becomes a hard cap on mercury emissions from coal-fired EGUs in that state.

CAA Section 111(d) requires that any state with EGUs to which CAMR applies must submit a state plan and enforceable mechanism indicating how the state will meet its specified budgets for mercury emissions reductions from CAMR units. Three CAMR units now operate in the State of Connecticut, and the Connecticut Department of Environmental Protection (Department) regulates mercury emissions from these three CAMR units through its new source review permitting (NSR) program. Thus, the NSR permits function as an element of the enforceable mechanism of this Connecticut Clean Air Mercury Rule State Plan (Plan). The Plan is described in detail at Sections II through IX below and in the referenced exhibits. Implementation of the Plan will reduce emissions of mercury from the state's coal-fired EGUs earlier and to a greater extent than required by CAMR, consistent with the state's "virtual elimination" goal for mercury.¹ Consequently, the Department chooses to opt-out of the federal mercury emissions trading program.

In satisfaction of the procedures established in 40 CFR 60 Subpart B and 40 CFR 60.24(h), this Plan includes:

- An inventory of the state's CAMR units and the units' associated mercury emissions;
- A description of the state's enforceable mechanism for the Plan;
- Monitoring, record keeping and reporting requirements in satisfaction of 40 CFR 75, with regard to mercury mass emissions;
- Emissions standards and compliance schedules and a demonstration of compliance with the state's annual mercury budget;
- A demonstration of the state's legal authority to adopt and implement the Plan;
- Provisions for progress reporting to EPA; and
- Records of the public notice and hearings on the Plan and its components.

¹ Conference of New England Governors/Eastern Canadian Premiers. 1998. *Mercury Action Plan*.

II. CAMR ELECTRIC GENERATING UNITS AND EMISSIONS

40 CFR 60.25 requires the state plan to include an inventory of all designated facilities and emissions data for the designated pollutant.

There are three existing CAMR units (the CAMR units) in the State of Connecticut: the Bridgeport Harbor steam generator #3 owned and operated by PSEG Power Connecticut, LLC (hereafter, PSEG Bridgeport Harbor #3) and two circulating fluidized bed boilers owned and operated by AES Thames, LLC (hereafter, AES Thames Units 1 and 2).

A. Bridgeport Harbor #3

By way of background, PSEG Bridgeport Harbor #3 is owned and operated by PSEG Power Connecticut, LLC, a subsidiary of a major unregulated independent power producer. Unit #3 is located in Bridgeport, Connecticut at the Bridgeport Harbor Station. Unit #3 is a 410 MW tangentially-fired boiler. The unit is dual-fueled and can burn either coal or #6 oil when producing electricity. The operation of the unit on coal includes the rated capacity of up to 400 MW net output, daily average. Adaro sub-bituminous coal from Indonesia is used to comply with Connecticut's strict regulatory requirements to limit sulfur emissions.² Indonesian coal has a lower sulfur content, ash content and mercury content than domestic bituminous coal. While burning #6 oil, the rated capacity is up to 410 MW net output, daily average. As such, the unit has a maximum heat input, nameplate value, of 4,100 MMBtu per hour. The unit is the largest coal-fired unit in Connecticut and the third largest in the New England Power Pool.

Unit #3 is equipped with an in-line heater (#2 oil-fired) to remove excess moisture from coal prior to combustion, an electrostatic precipitator to control particulate emissions and a sulfur injection system to control the resistivity of the ash and thereby the effectiveness of the precipitator. To comply with Connecticut General Statute (CGS) Section 22a-199, PSEG Power Connecticut, LLC is installing an activated carbon injection (ACI) system with pulse-jet fabric filter baghouse to control mercury. This system is being installed downstream from the unit's existing electrostatic precipitator and upstream from the stack. The unit will only operate when Unit #3 is burning coal and will not be used when the unit is burning oil, including unit startups and shutdowns, as oil will seriously compromise the function of the bags. The electrostatic precipitator will still be used when the unit burns oil. This new control equipment is scheduled to be in operation prior to July 1, 2008.

B. AES Thames Units 1 and 2

AES Thames, LLC operates a cogeneration facility located in the Uncasville, Connecticut. The facility produces electricity, which it sells to the grid, and steam, which it sells to a neighboring paper plant. The two units are identical Combustion Engineering circulating fluidized bed boilers, each with maximum heat input of 923 MMBtu/hr. Together, the two units can generate 181 MW of electricity. Dry limestone injection followed by fabric filtration controls sulfur emissions. The boilers are primarily fired with bituminous coal. Distillate oil is used during startup, shutdown and operational stabilization. The boilers are designed to operate continuously.

² See Regulations of Connecticut State Agencies (RCSA) section 22a-174-19a.

C. Mercury Emissions

Total current mercury emissions from the three CAMR units are calculated to be 71.80 pounds per year, a level below the Phase 1 state mercury emissions cap assigned under CAMR. Beginning July 1, 2008, CGS section 22a-199 requires the owners and operators of the three CAMR units to meet an emissions rate of equal to or less than 0.6 pounds of mercury per TBtu, or meet a mercury emissions rate equal to a 90% reduction of mercury from the measured inlet conditions for the unit. In response to the requirements of CGS section 22a-199, PSEG Power Connecticut, LLC is in the process of installing mercury emissions control equipment. AES Thames, LLC is not installing additional control equipment since the mercury emissions from Units 1 and 2 now comply with the limitations of CGS section 22a-199. To reflect the adoption of CGS section 22a-199, PSEG Power Connecticut, LLC and AES Thames, LLC submitted and have been issued modifications to the NSR permits for those units. Each of those permit modifications includes a unit-specific annual mercury mass emissions cap. As of July 1, 2008, permitted annual mercury mass emissions from all three CAMR units will total 32.16 pounds, well below the Phase 1 and Phase 2 mercury emissions caps assigned to Connecticut. Additional explanation of the projected emissions is provided in Section VI of this Plan. Current and future permitted mercury emissions, based on the unit-specific mercury mass emissions caps, from the three CAMR units are summarized in Table 1.

CGS section 22a-199 also provides that an owner or operator of a coal-fired EGU who installs pollution control equipment to control mercury emissions yet fails to achieve the 0.6 lbs/TBtu or 90% reduction requirement may petition the Commissioner for an alternative limit based on actual emissions data. Given PSEG Power Connecticut, LLC's new ACI and baghouse installation, PSEG Power Connecticut, LLC may request an alternative emissions limit. As explained in Section VI of this Plan, such an event would not abrogate the demonstration of compliance made in this Plan, since this Plan includes enforceable requirements that ensure that emissions from the universe of coal-fired EGUs in Connecticut will be below the federally assigned caps.

Table 1. CAMR unit annual mercury emissions

	Current Calculated Annual Mercury Emissions (pounds)	Annual Permitted Emissions as of July 1, 2008 (pounds)	CAMR Phase 1 (2010) State Cap (pounds)	CAMR Phase 2 (2018) State Cap (pounds)
PSEG Bridgeport Harbor #3	43.4	21.76*		
AES Thames Unit 1	14.2	5.2		
AES Thames Unit 2	14.2	5.2		
Total	71.8	32.16	106	42

* PSEG Power Connecticut, LLC expects to operate Bridgeport Harbor #3 in compliance with the emissions rate requirement of CGS section 22a-199 as of July 1, 2008 and, assuming that, will effectively meet the 21.76 lb/yr limit. However, CGS section 22a-199 does not specify an annual limitation on emissions, so the 21.76 lb/yr limit is not effective as a permit requirement for Bridgeport Harbor #3 until January 1, 2010, under the authority of CAMR.

III. ENFORCEABLE MECHANISM

The Department has chosen to use the state's federally approved NSR program as the basis of the enforceable mechanism for the Plan. The requirements of CGS section 22a-199 in combination with the applicability of the regulation underlying the NSR program, new restrictions in the NSR program to limit mercury emissions from CAMR units and modifications to the NSR permits for the CAMR units will ensure that all CAMR units – existing and new -- will be subject to requirements to ensure the state's compliance with the applicable level of the state mercury budget.

A. CGS Section 22a-199

The Connecticut General Assembly adopted CGS section 22a-199 in 2003. Beginning July 1, 2008, Section 22a-199 requires each owner or operator of a CAMR unit to either meet an emissions rate equal to or less than 0.6 pounds of mercury per TBtu or meet a mercury emissions rate equal to a 90% reduction of mercury from the measured inlet conditions for the unit. Section 22a-199 also requires quarterly stack testing and reporting. Because CGS section 22a-199 includes the alternative emissions limit option for an owner or operator who installs and operates appropriate mercury control equipment yet fails to comply with the 0.6 pounds of mercury per TBtu limit or the 90% reduction requirement, EPA does not consider CGS section 22a-199 standing alone to be a sufficient enforceable mechanism. As a result, the Department buttresses the requirements of CGS section 22a-199 with specific NSR permit requirements for new and existing CAMR units to establish a complete and sufficient enforceable mechanism in satisfaction of CAMR. The NSR portions of the enforceable mechanism are described below. The text of CGS section 22a-199 is available at Exhibit A of this Plan and at <http://www.cga.ct.gov/2005/pub/Chap446c.htm#Sec22a-199.htm>

B. New Source Review Permits

To satisfy CAMR's requirements for limits on allowable rates of emissions and annual emissions caps, as well as requirements for monitoring, record keeping and reporting in satisfaction of 40 CFR 60.24(h)(4), the NSR permits³ for each of the three CAMR units have been modified to reflect the requirements of CGS section 22a-199, CAMR and, in the case of the Bridgeport Harbor #3, the installation of ACI and a pulse-jet fabric filter baghouse. The modified permits are included in Exhibits C and D of this Plan. See Section IX of this Plan regarding public notice of and the opportunity for public comment on the permit modifications.

In each of the NSR permits issued to the existing CAMR units, the Department is relying on only certain provisions to satisfy CAMR and implement this Plan. The particular permit conditions the Department incorporates into this Plan are as follows:

For Bridgeport Harbor #3, permit no. 015-0089:

- The authorization at page 1,
- Part V, pound per year mercury limit at page 9,
- Part V, notes v and vii at page 10, and
- Part VIII.C. at pages 11-12;

³ PSEG Bridgeport Harbor #3 operates under permit number 015-0089, originally issued on May 10, 1985. AES Thames Units 1 and 2 operate under permit numbers 107-0010 and 107-0011, originally issued on July 29, 1987.

For AES Thames Unit 1, permit no. 107-0010:

- The authorization at page 1,
- Part D.10. at page 10, and
- Part H, ton per year mercury limit at page 12; and

For AES Thames Unit 2, permit no. 107-0011:

- The authorization at page 1,
- Part D.10. at page 10, and
- Part H, ton per year mercury limit at page 12.

C. Amendment of the New Source Review Permitting Program

The state mercury emissions caps assigned by CAMR are permanent caps regardless of growth in the electric sector. Thus, new unit emissions must be addressed within the levels of the caps.

To address CAMR requirements for any new coal-fired EGUs that may be constructed in the state, the Department has amended Connecticut's NSR permitting program regulation, RCSA section 22a-174-3a, by adding new subsection (n). The requirements of subsection (n) ensure that mercury emissions from any new CAMR units that may be constructed in the state, in combination with the existing CAMR units, will not exceed the CAMR state mercury emissions caps. Under subsection (n), no person will be granted a permit to construct and operate a coal-fired EGU unless such an EGU can be operated so that the state will remain in compliance with CAMR and this Plan.

Subsection (n) also addresses the monitoring, record keeping and reporting required under CAMR. A public hearing was held on the proposed subsection on October 31, 2006 with the comment period closing on November 3, 2006. The amendment was adopted on May 29, 2007. The text of the amendment and the associated public participation documents are included in Exhibit B of this Plan.

In addition to new subsection (n), the existing applicability requirements of subsection (a) of RCSA section 22a-174-3a ensure that the owner or operator of any new CAMR unit in the state is required to apply for and obtain a permit to construct and operate. Subsection (a) of RCSA section 22a-174-3a is included in Exhibit B of this Plan.

IV. OPT-OUT OF NATIONAL TRADING PROGRAM

The Department will not participate in the CAMR national cap-and-trade program for mercury but will instead rely on the requirements of CGS section 22a-199 as implemented through the NSR permit program and this Plan to achieve more certain reductions in mercury emissions, ensuring better protection of public health and the environment.⁴ Because Connecticut will not participate in the national cap-and-trade program for mercury, the state emissions budget will serve as an enforceable state cap, and this Plan is complete without a method to allocate mercury allowances to the state's CAMR units. The Department understands that, as a result of this opt-out, Connecticut's budget will not be included in the national trading program.

⁴ Connecticut, along with eight other states, on March 29, 2005 filed a petition in the D.C. Circuit Court requesting reconsideration on CAMR. The case is *State of New Jersey, et al. v. U.S. Environmental Protection Agency*, Docket No. 06-1211 (D.C. Cir.). The submission of this Plan does not imply the Department's agreement to the legal basis of CAMR or contradict the issues briefed by Connecticut and the other state plaintiffs in that case.

If Connecticut were to participate in CAMR's national cap-and-trade program and fully allocate the Connecticut CAMR Phase 1 and 2 mercury budgets, then in-state emissions reductions achieved and maintained under CGS section 22a-199 could be negated. The owners of the Connecticut CAMR units could sell their excess mercury allowances to owners and operators of CAMR units in upwind states who, in turn, could operate their units to emit more mercury that could travel back to Connecticut on the prevailing winds. Even if Connecticut participated in the national mercury trading program and allocated allowances at the level of emissions based on the limitations of CGS section 22a-199, there would be no guarantee that emissions at any particular location would be controlled, thus creating the potential for mercury hotspots.

V. MONITORING, RECORD KEEPING AND REPORTING

Even in a state that does not participate in the national trading program, the owners and operators of CAMR units are required to comply with the monitoring, record keeping and reporting requirements of 40 CFR 75. Monitoring options include (1) continuously collecting mercury emissions data from each affected unit using continuous emissions monitoring (CEM) equipment; (2) an appropriate long-term method (*e.g.*, sorbent trap) that can collect an uninterrupted, continuous sample of the mercury in the flue gases emitted from the unit; (3) stack testing for low-emitters; or (4) an EPA-approved facility-specific alternative monitoring system, for which any facility owner may petition. CAMR also requires the owner or operator of a CAMR unit "to maintain records of all information needed to demonstrate compliance with the applicable Hg emissions limit, including the results of performance tests, data from the continuous monitoring systems, fuel analyses, calculations used to assess compliance, and any other information specified in 40 CFR 60.7 (General Provisions)."

While CAMR generally requires owners and operators of CAMR units to determine and report emissions by following the procedures of 40 CFR 75 beginning January 1, 2009, including submitting an electronic data report each calendar quarter containing consolidated mercury, sulfur dioxide, nitrogen oxides and carbon dioxide emissions data, CAMR also provides for an alternative, less rigorous monitoring option for low mercury emitting units.⁵ Qualifying units may use periodic emissions testing (*i.e.*, stack tests) to quantify mercury mass emissions, rather than continuously monitoring the concentration of mercury emitted. To qualify, affected units must have annual emissions below a certain level. For affected units with mercury emissions greater than 9 pounds per year but less than or equal to 29 pounds per year, semi-annual testing is required. For units with mercury emissions less than 9 pounds per year, annual testing is required.

The Department is proposing to require owners and operators of CAMR units to comply with the emissions monitoring, record keeping and reporting provisions of 40 CFR 75 and to allow the use of stack testing to monitor compliance under CAMR's low-emitter provisions.

As indicated in Section II of this Plan and Table 1, the Department anticipates that each of the state's CAMR units will have annual mercury emissions less than 29 pounds as of July 2008 when each unit is operated in compliance with the mercury emissions limits of CGS section 22a-199. All three of the state's existing CAMR units are required to perform quarterly stack testing for mercury under CGS section 22a-199. Section 22a-199(b)(3)(A) requires such quarterly stack

⁵ See 40 CFR 75.81(b) through (g).

tests to be conducted on a calendar quarter basis in accordance with the EPA Method 29 for the determination of metal emissions from stationary sources, as set forth in 40 CFR 60, Appendix A, as amended from time to time. CGS section 22a-199(b)(4) requires quarterly reporting to the Commissioner of stack testing results. RCSA section 22a-174-3a(n) and the modified NSR permits for the three existing CAMR units add to the stack testing and reporting requirements of CGS section 22a-199 the need for the owners and operators of CAMR units to also comply with the applicable requirements of 40 CFR 75. Therefore, the quarterly stack testing required under CGS section 22a-199 and incorporated into the NSR permits for each of the units will satisfy the monitoring requirements of CAMR. As indicated in Sections VI and VIII, the Department will be updating the compliance demonstration of this Plan with actual emissions data to establish the existing units as low mercury emitting units. Should any CAMR unit monitor annual mercury emissions in excess of 29 pounds, a CEM system for mercury will be required to be installed and certified in accordance with 40 CFR 75.81.

In addition to installation of CEM systems should any unit exceed the low-emitter emissions bracket, CGS section 22a-199(b)(3)(B) provides the Commissioner independent authority to order CEM installation and operation at the state's CAMR units. In such an event, the Commissioner would notify EPA of the monitoring change.

VI. DEMONSTRATION OF COMPLIANCE

40 CFR 60.24(h)(3) requires that a CAMR state plan "contain emission standards and compliance schedules and demonstrate that they will result in compliance with the State's annual electrical generating unit (EGU) mercury (Hg) budget." As a result of the requirements of CGS section 22a-199 and additional requirements identified in this Plan, mercury emissions from the state's CAMR units are projected to be reduced to a level below CAMR's Phase 2 mercury budget for Connecticut before 2013. See Figure 1 and Table 1 for summaries of the current and future permitted emissions reductions. This demonstration both addresses the potential construction of new CAMR units and includes assumptions to generate what could be characterized as a moderated "worst case" analysis.

A. Existing CAMR Units

The mercury emissions limitations of CGS section 22a-199, when incorporated into NSR permits for the CAMR units in the form of an annual pound per year cap, provide a framework to demonstrate compliance with the CAMR Phase 1 and 2 budgets for Connecticut. Beginning July 1, 2008, CGS section 22a-199 requires that any owner or operator of a coal-fired EGU either meet an emissions rate equal to or less than 0.6 pounds of mercury per TBtu or meet a mercury emissions rate equal to a ninety per cent reduction of mercury from the measured inlet conditions for the unit.

The requirements of CGS section 22a-199 are taken into account in the modified NSR permits issued for each of the three existing units in the form of emissions limitations and unit-specific annual mercury mass emissions caps. The total of these three unit-specific annual mass caps yields the annual mercury emissions indicated in Table 1, when the assumptions listed below are applied. Given the capacity, compliance limit, coal content and removal efficiency assumed, the emissions in Table 1 are likely higher than actual future emissions, assuming that:

- Each unit operates at 100% annual capacity.
- Each of the three units intends to comply with CGS section 22a-199 by meeting the 0.6 lbs/TBtu limit, not the 90% reduction, or an alternative.
- AES Thames Units 1 and 2, as a result of the fluidized bed combustion technology with limestone injection and collection system and as verified by stack testing, complies with the 0.6 lbs/TBtu.
- PSEG Bridgeport Harbor #3 combusts Indonesian coal with a maximum mercury content of 4 lbs/TBtu. Therefore, compliance with the 90% reduction requirement of CGS section 22a-199 would be more stringent than the 0.6 lbs/TBtu limit. The 0.6 lbs/TBtu limit will yield higher or more conservative annual mercury emissions. See Attachment 1 to the modified permit for Unit #3 in Exhibit C for the pertinent calculations.
- PSEG Power Connecticut, LLC operates the ACI system and baghouse now under construction.
- PSEG Bridgeport Harbor #3 obtained an 85% mercury removal efficiency guarantee from its air pollution control equipment vendor.

Because the current emissions are lower than the CAMR Phase 1 budget of 106 pounds, and since, under the assumptions identified above, the emissions from the existing CAMR units are projected to decrease to 32.16 pounds in 2008 under the limitations of CGS section 22a-199, the requirements of CGS section 22a-199, incorporated into the NSR permits for each of the three existing CAMR units in the form of an annual unit-specific mercury mass emissions cap, constitutes compliance with the CAMR Phase 1 mercury budget and deadlines. For the existing CAMR units, the projected annual mercury emissions of 32.16 pounds, as of 2008, also constitutes compliance with the CAMR Phase 2 mercury budget of 42 pounds per year. Thus, a portion of the budget is preserved for new units.

In making this demonstration, the Department acknowledges that certain factors may result in actual emissions from the existing units that vary from those predicted. To wit, PSEG Power Connecticut, LLC is now installing mercury emissions control equipment and may, after July 1, 2008 and in accordance with CGS section 22a-199, request an emissions limit alternative to either limit designated in Section 22a-199. As a result, the permitted 21.76 pounds of annual mercury emissions may not be sufficient to cover actual emissions and a permit modification will be necessary. An equally, if not more, likely alternative is that actual emissions from the CAMR units in 2008 and beyond will be lower than total permitted level, if, for example, the controls at PSEG Bridgeport Harbor #3 operate at a higher removal efficiency than assumed here. Furthermore, as the assumptions used to calculate emissions from the existing CAMR units ensure that the calculated levels are conservatively high, the margin remaining for new units may, indeed, be larger than estimated here. As indicated below, an update to this compliance demonstration based on actual emissions data collected in 2008 and 2009 will resolve the uncertainty of the emissions projections.

B. New CAMR Units

To ensure compliance with the CAMR Phase 2 mercury budget should any new CAMR units be constructed, the Department is relying on the emissions limitations of CGS section 22a-199 in combination with the applicability of RCSA section 22a-174-3a(a) and the mercury reduction requirements of subsection (n) of RCSA section 22a-174-3a. The portion of the emissions cap

reserved for new units provides for the construction of new CAMR units, yet subsection (n) ensures that no such new CAMR unit will be granted a NSR permit unless the combined emissions from the proposed unit and the existing CAMR units at that time is below the applicable state cap. Subsection (n) effectively results in a review of the actual mercury emissions from all the CAMR units whenever the Department receives an application proposing construction of a new coal-fired EGU or modification of an existing CAMR unit in a manner that changes its mercury emissions. Furthermore, subsection (c) of CGS section 22a-199 provides specific authority to the Commissioner to, after July 1, 2012, establish mercury emission limits that are more stringent than those provided in CGS section 22a-199. Prior to establishing any new emissions limits, CGS section 199 requires the Commissioner to conduct a review of mercury emissions limits for the subject units. The Department will use the 2012 emissions review mandated by CGS section 22a-199 to determine whether the Phase 2 state mercury emissions cap of 42 pounds should be imposed earlier than 2018, and, if so, seek to revise RCSA section 22a-174-3a(n) accordingly.

While the Department is concerned about the environmental impacts of mercury emissions from EGUs, we understand that coal-fired generation may have a role in diversifying Connecticut's energy generation technologies and balancing the portfolio of the state's generation resources to maintain electric system reliability and security into the future. Thus, in devising requirements applicable to potential CAMR units, the Department has given particular attention to the possible construction of one or more integrated gasification combined cycle (IGCC) units in Connecticut.⁶ EPA believes the best method of reducing mercury emissions from IGCC units is to remove mercury from the synthetic gas (syngas) before combustion. An existing industrial IGCC unit has demonstrated a process, using sulfur-impregnated activated carbon (AC) beds, that has proven to yield 90 to 95% mercury removal from the coal syngas. Available information indicates that this technology could be adapted to electric utility IGCC units, and EPA believes this to be a viable option for new IGCC units.⁷ The availability of such technology plus the availability of coals, such as Adaro, with a very low mercury content enable the construction of an IGCC plant with annual mercury emissions below 10 pounds per year.

The calculated emissions associated with a 770 MW IGCC facility now under construction in Illinois validate the reasonableness of the level of the new unit budget remainder allowed by this Plan. The Illinois plant has a planned mercury emissions rate below 0.0000020 lbs/MWh. Even operating at 100% capacity, the annual mercury emissions from such a plant would be about 10 pounds per year.

The constraint on emissions imposed by CGS section 22a-199 further assured the Department that the Plan does not preclude the construction of potential IGCC units. Specifically, Section 22a-199 requires the owner or operator of a regulated unit to either meet a mercury emissions rate of less than or equal to 0.6 lbs/TBtu or a 90% reduction of mercury *from measured inlet conditions*. "Inlet conditions" are defined as "the concentration of mercury in the flue gas exiting the *combustion source* prior to application of any air pollution control device. [*emphasis*

⁶ CAMR is applicable to IGCC units as they are considered "electric utility steam generating units." CAMR at 28611. In 2006 when this Plan was in the draft stage, one wholesale electric generation company in Connecticut considered, and later abandoned, the possible construction of an IGCC unit in Montville, Connecticut.

⁷ CAMR at 28614.

added]”⁸ Thus, an IGCC owner or operator would be very limited in meeting the 90 percent reduction limitation since that reduction would be in addition to the 90 to 95 percent potential mercury removal from the syngas prior to combustion. By default, such an owner or operator would look to compliance with the 0.6lbs/TBtu limit. Recently issued permits for IGCC units, namely Elm Road, Wisconsin and Southern Illinois Clean Energy Center, have mercury emission limitations below 0.6 lbs/TBtu. The IGCC unit previously contemplated in Connecticut would have had a proposed firing rate of 1818 MMBtu/hr. A 0.6 lbs/TBtu emission limitation on this source would yield annual mercury emissions below 10 pounds.

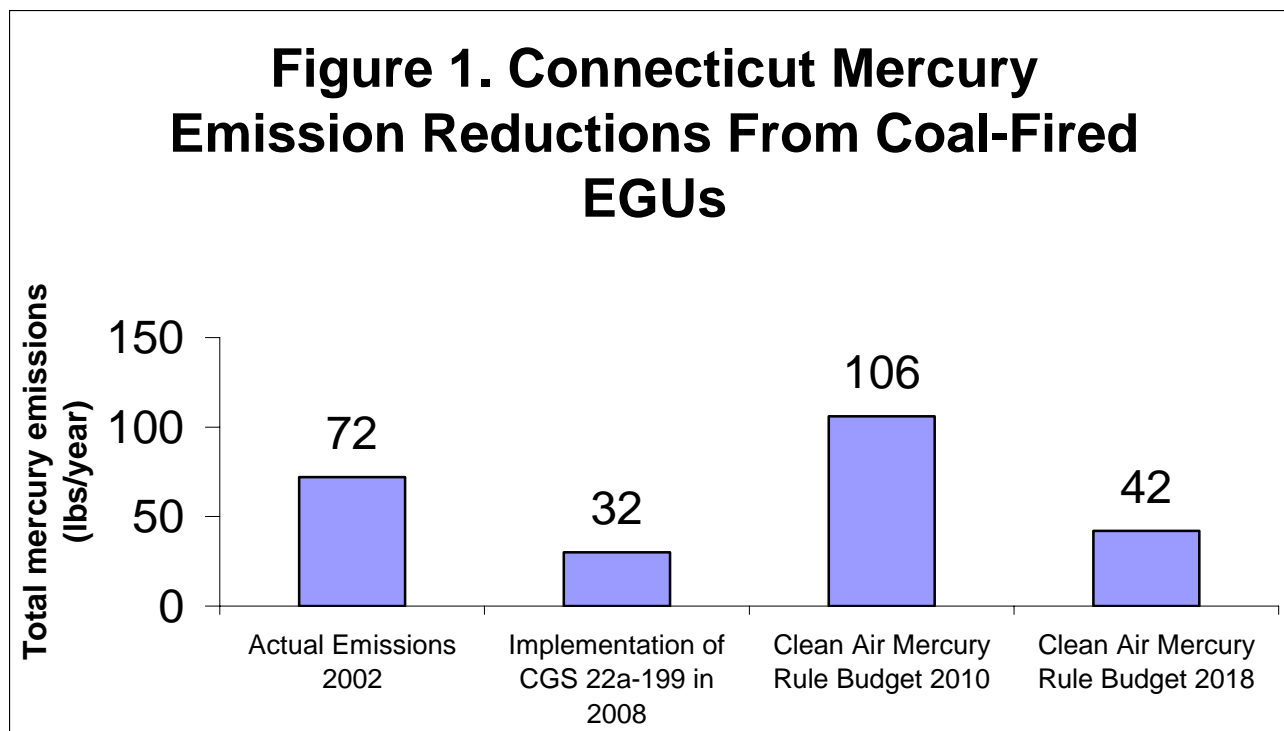
C. Emissions Maintained Below State Caps

As demonstrated above, the requirements of CGS section 22a-199, enforced through individual NSR permits modified as indicated herein for the three existing CAMR units, ensures that the mercury emissions from the state’s existing units do not now exceed the CAMR Phase 1 budget for the state and will not in the future exceed the CAMR Phase 2 state mercury budget. The requirements of RCSA section 22a-174-3a(a) and (n) will ensure that mercury emissions from any new CAMR units that may be constructed in the state, in combination with the emissions from the existing CAMR units, will not exceed the CAMR Phase 2 state mercury budget.

As described in Part V of this Plan, each CAMR unit will have to perform quarterly mercury stack tests under the authority of CGS section 22a-199. This testing schedule commences in July 2008. The Department will have two years of mercury stack test data prior to the 2010 CAMR implementation date. This will afford the Department time to review mercury emissions from the existing CAMR units and make a subsequent compliance demonstration prior to the implementation date based on actual data for 2008-2009.

⁸ CGS section 22a-199(a) defines inlet conditions as:

“Inlet conditions” means either: (A) the concentration of mercury in the flue gas exiting the combustion source prior to application of any air pollution control device; or (B) in the case of a fluidized bed combustion unit, the concentration of mercury input to the combustion source based on representative fuel sampling and analysis, as determined by the Commissioner of Environmental Protection.”



VII. LEGAL AUTHORITY

40 CFR 60.24(h)(5) requires a state to demonstrate two general components of its legal authority with regard to the CAMR units: (1) to adopt emissions standards and compliance schedules necessary for attainment and maintenance of the state’s annual CAMR EGU mercury budget; and (2) require owners and operators of CAMR EGUs in the state to meet the necessary monitoring, record keeping and reporting requirements.

The general statutes of Connecticut provide adequate legal authority for the Department to develop the Plan. The Commissioner is required under CGS section 22a-5(e) to “provide for the prevention and abatement of all water, land and air pollution, including, but not limited to, that related to particulates, gases, ...” To carry out this power, the General Assembly grants the Commissioner “all powers necessary and convenient to faithfully discharge this duty.”⁹

The broad grant of authority to the Commissioner, as outlined above, to limit emissions from sources of air pollution, in combination with the mandates of CGS section 22a-199 and additional authority provided in statute and regulation, is more than sufficient to require owners and operators of coal-fired EGUs to limit mercury emissions to a level below the federally assigned state cap and to meet necessary monitoring, record keeping and reporting requirements. Information on obtaining statutes and regulations referenced in this Section are provided in Exhibit F.

⁹

CGS section 22a-5.

A. Adopt Emission Standards and Compliance Schedules

40 CFR 60.24(h)(5) requires that a state plan must demonstrate the state's legal authority to "adopt emission standards and compliance schedules necessary for attainment and maintenance of the state's relevant annual EGU mercury budget." The emissions standards that limit mercury emissions from CAMR units are provided in statute, regulation and operating permits. The main statement of standards and compliance dates for mercury from CAMR units is in CGS section 22a-199, which requires that, as of July 1, 2008, coal-fired electric generating units either meet an emissions rate less than or equal to 0.6 pounds of mercury per TBtu or a rate equal to a 90% reduction of mercury from the measured inlet. RCSA section 22a-174-3a(n) further prevents any new CAMR unit from operating in the state unless its mercury emissions are limited so that all CAMR units, new and existing, operate within the applicable state cap. NSR permit modifications issued for the three existing CAMR units under the authority of RCSA section 22a-174-3a include annual unit-specific caps on mercury emissions. The Commissioner's authority to take these actions to limit mercury emissions is firmly based in the following elements of authority:

Adopt emissions standards and compliance schedules. The Commissioner is empowered to "adopt, amend or repeal . . . such environmental standards, criteria and regulations . . . as are necessary and proper to carry out his functions, powers and duties."¹⁰

Adopt, amend and repeal regulations. The Commissioner has the power "to formulate, adopt, amend and repeal regulations to control and prohibit air pollution throughout the state. . . which regulations shall be consistent with the federal Air Pollution Control Act. . ."¹¹

Issue permits. CGS section 22a-174(c) provides the Commissioner with the power: in accordance with regulations adopted by him, (1) to require that a person, before undertaking the construction, installation, enlargement or establishment of a new air contaminant source. . . submit to him plans, specifications and such information as he deems reasonably necessary relating to the construction, installation, enlargement or establishment of such new air contaminant source; (2) to issue a permit approving such plans and specifications and permitting the construction, installation, or establishment of the new air contaminant source. . . .

B. Require Monitoring, Record keeping and Reporting

In addition to the statutory authority summarized above, the Commissioner has adopted a regulation, RCSA section 22a-174-3a, to implement the state's federally approved NSR program. Of note, subsection (d)(3) of that regulation identifies a broad array of requirements an applicant for an NSR permit or modification must meet, including operation in accordance with all applicable and relevant emissions limitations, statutes, regulations, schedules for stack tests, standards of performance pursuant to 40 CFR Parts 60, 61, and 63, as may be amended from time to time, and the installation and operation of monitoring equipment. Summarized below are additional elements of the Commissioner's authority to require monitoring, record keeping and reporting and to obtain information necessary to determining compliance.

¹⁰ CGS section 22a-6(a)(1).

¹¹ CGS section 22a-174(a).

Conduct tests and require the use of monitors. CGS section 22a-174(d) provides that “The commissioner shall have all incidental powers to carry out the purposes of [Chapter 446c, entitled “Air Pollution Control,” which encompasses CGS sections 22a-170 through 22a-206]”¹²

RCSA section 22a-174-5(e)(2) provides the broad authority of the Commissioner to require testing:

. . . [T]he Commissioner may require the owner or operator of any stationary source to conduct emission tests of emissions [*sic*]. Tests required under the provisions of . . . this subdivision shall be conducted in a manner satisfactory to the Commissioner . . . and the Commissioner or his representative shall be entitled to observe the tests, including initial sampling, subsequent laboratory tests, and other related procedures.¹³

RCSA section 22a-174-4(a)(1) provides the authority of the Commissioner to require air pollutant monitoring: “The owner or ‘operator’ of any ‘air pollution’ ‘source’ shall install, use, and maintain monitoring equipment”¹⁴ RCSA section 22a-174-4(a)(2) provides that, when continuous emissions monitoring equipment and methods are “reasonably available,” the Commissioner may require the owner or operator to continuously monitor emissions.¹⁵ If the Commissioner determines continuous emissions monitoring is technologically infeasible, he may require reasonable monitoring or intermittent stack testing as he deems necessary to determine compliance with applicable regulations.¹⁶

CGS section 22a-199(b)(3) further requires the owners and operators of CAMR units to demonstrate compliance with the mercury emissions limitations of that statute through quarterly stack testing and further provides for the Commissioner to direct the installation and operation of CEMs for mercury at such time as such CEMs are commercially available.

Require record keeping. CGS section 22a-174(c) states “The commissioner shall have the power, in accordance with regulations adopted by him, to require any person to maintain such records relating to air pollution or to the operation of facilities designed to abate air pollution as he deems necessary to carry out the provisions of [Chapter 446c, entitled “Air Pollution Control,” which encompasses CGS sections 22a-170 through 22a-206]”¹⁷

RCSA section 22a-174-4(c) implements CGS section 22a-174(c) and establishes the scope of the Commissioner’s authority to require record keeping:

The “Commissioner” may require the submission of any records or reports of monitoring data and other information as he deems necessary to fulfill the purpose and policies contained in these

¹² CGS section 22a-174(d).

¹³ RCSA section 22a-174-5(e)(2).

¹⁴ RCSA section 22a-174-4(a)(1).

¹⁵ RCSA section 22a-174-4(a)(2).

¹⁶ Id.

¹⁷ CGS section 22a-174(c)(4).

regulations. Such record keeping and reporting may be required of any “point source” or any “indirect source” of “air pollution.” Records and reports required by the “Commissioner” concerning “air pollutants,” fuels, and operational information shall be recorded, compiled, and submitted on forms furnished or prescribed by the “Commissioner.” And shall be signed or verified in writing by a ranking corporate officer or managing official with offices located in the state.¹⁸

RCSA section 22a-174-4(c) also establishes the form in which the records must be maintained and the length of time for which they must be kept, unless other requirements apply.¹⁹

Require emission reports. CGS section 22a-174(c) states:

The commissioner shall have the power, in accordance with regulations adopted by him, to require any person to maintain such records relating to air pollution or the operation of facilities designed to abate air pollution as he deems necessary to carry out the provisions of [Chapter 446c, entitled “Air Pollution Control,” which encompasses Connecticut General Statutes sections 22a-170 through 22a-206].²⁰

RCSA section 22a-174-4(a)(1) provides the specific authority of the Commissioner to require periodic reports of source emissions : “The owner or ‘operator’ of any ‘air pollution’ ‘source’ shall . . . make periodic reports as prescribed herein by the Commissioner.”²¹ The related reporting requirement is described in RCSA section 22a-174-4(c).²²

CGS section 22a-199(b)(4) requires the owners and operators of CAMR units to report on a calendar quarter basis the result of any stack tests or the average of any CEMs data.

Obtain information necessary to determine compliance. The General Assembly has provided the Commissioner with ample authority to determine compliance. CGS section 22a-6 states:

¹⁸ RCSA section 22a-174-4(c)(1).

¹⁹ "Any monitoring data required of [any real or personal property that emits or may emit dust, fumes, mist, smoke, other particulate matter, vapor, gas, aerosol, odorous substances, or any combination, excluding carbon dioxide, uncombined water vapor or water droplets, or molecular oxygen or nitrogen] shall be kept current and in a form allowing easy inspection and shall be retained . . . for a period of three years.” RCSA section 22a-174-4(c)(2).

²⁰ CGS section 22a-174(c)(4).

²¹ RCSA section 22a-174-4(a)(1).

²² RCSA section 22a-174-4(c) states:

The Commissioner may require the submission of any records or reports of monitoring data and other information as he deems necessary to fulfill the purpose and policies contained in these regulations. Such record keeping and reporting may be required of any point source or any indirect source of air pollution. Records and reports required by the Commissioner concerning air pollutants, fuels, and operational information shall be recorded, compiled, and submitted on forms furnished or prescribed by the Commissioner. And shall be signed or verified in writing by a ranking corporate officer or managing official with offices located in the state.

The commissioner may, in accordance with constitutional limitations, enter at all reasonable times, without liability, upon any public or private property, except a private residence, for the purpose of inspection and investigation to ascertain possible violations of any statute, regulation, order or permit administered, adopted or issued by him and the owner, managing agent or occupant of any such property shall permit such entry²³

Further, the Commissioner “may apply to any court having criminal jurisdiction for a warrant to inspect such premises to determine compliance with any statute, regulation, order or permit administered, adopted, or enforced by him”²⁴

VIII. PROGRESS REPORTING

The Department will report to EPA annually and as necessary regarding the information specified in 40 CFR 60.25(f) including identification of any CAMR units that ceased or began operation during the reporting period; submission of inventory data for CAMR units began operating subsequent to previous reports, and any additional data necessary to update the unit or emissions inventory.

IX. PUBLIC HEARING AND NOTICE REQUIREMENTS

In satisfaction of 40 CFR 60.23, this Section identifies the public notification and participation opportunities available concerning the Plan and its components.

A. Amendment of RCSA Section 22a-174-3a

The addition of subsection (n) to the NSR permitting regulation, RCSA section 22a-174-3a, was set for hearing and the notice of hearing was signed by the Commissioner on September 8, 2006. The hearing notice was published on September 26, 2006 in four area newspapers: *The New London Day*, *the Connecticut Post*, *The Register Citizen* and *the Hartford Courant*. The amendment was available for public inspection at the Bureau of Air Management and four public libraries. Notice of the hearing was provided to the EPA Regional Administrator and the state air quality regulators in the surrounding states of Massachusetts, New Jersey, New York and Rhode Island.

A public hearing was held on October 31, 2006 at 2 PM in Hartford, Connecticut. Representatives from PSEG Power Connecticut LLC and NRG Energy, Inc. attended the hearing and submitted written comments along with EPA and AES Thames, LLC. Certification that a public hearing was held and a summary of the written comments is provided in Exhibit B.

After receiving all approvals necessary under state law, the amendment was filed with the Secretary of State’s office and thereby adopted in Connecticut on May 29, 2007. The final text of the subsection is available in Exhibit B and at:

http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322184&depNav_GID=1619

²³ CGS section 22a-6(a)(5). For further authority of such powers, see CGS section 22a-177.

²⁴ CGS section 22a-6(a)(5).

B. NSR Minor Permit Modification for PSEG Bridgeport Harbor #3

A notice of tentative determination for PSEG Power Connecticut, LLC's application to modify the NSR permit for Bridgeport Harbor #3 was published in the *Connecticut Post* on November 8, 2006. The comment period closed on December 8, 2006. The draft permit was also subject to public hearing and comment with the proposed Plan narrative (*see* Section IX.D). EPA submitted comment on the draft permit during this comment period. The permit was issued on February 7, 2007.

The text of the final modified permit is available in Exhibit C, along with the notice of tentative determination and the written comments.

C. NSR Non-Minor Permit Modification for AES Thames Units 1 and 2

The use of the non-minor permit modifications as an enforceable mechanism of the state plan was described in the draft state plan and positive general comment concerning the use of the NSR program to enforce the state plan was submitted during the comment period on that proceeding. In addition, the AES Thames units are specifically identified as "existing coal-fired electric generating units" in RCSA section 22a-174-3a(n), which was also the subject of a notice, comment and hearing process as explained in Section IX.A. of this Plan.

A notice of the tentative determination on the non-minor permit modifications for AES Thames units 1 and 2 was published in *The Day* (New London, Connecticut) on June 28, 2007 and that notice provided for a 30-day public comment period. EPA submitted comment on the proposed modifications during this period. No request for a hearing was submitted. The modifications were issued on October 17, 2007. The text of the final modified permits is available in Exhibit D, along with the notice of tentative determination and the associated written comments and responses.

D. The Plan Narrative and Proposed PSEG Bridgeport Harbor #3 Minor Permit Modification

The Plan was set for hearing and the notice signed by the Commissioner on November 17, 2006. The hearing notice was published on November 22, 2006 in four area newspapers: *The New London Day*, the *Connecticut Post*, *The Register Citizen* and the *Hartford Courant*. The Plan was available for public inspection at the Bureau of Air Management and four public libraries. Notice of the hearing was provided to the EPA Regional Administrator and the state air quality regulators in the surrounding states of Massachusetts, New Jersey, New York and Rhode Island. The noticed narrative included the draft permit associated with the tentative determination notice for PSEG Bridgeport Harbor #3.

A public hearing was held on December 28, 2006 in Hartford, Connecticut. Robert Silvestri of PSEG Power Connecticut LLC attended the hearing. Written comments were submitted by David Conroy, EPA Region 1; Robert Silvestri, PSEG Power Connecticut LLC; Roger Smith, Clean Water Action; Mark Boucher, AES Thames, LLC; and Cynthia L. Karlic, NRG Energy Inc. Certification that a public hearing was held regarding the Plan, a list of the attendees at the hearing and their affiliation and a summary of the written comments are provided in Exhibit E.