

OFFICE OF ADJUDICATIONS

*IN THE MATTER OF* : *APPLICATION Nos. 2014101398  
& 201410892*

*NUTMEG STATE*  
*CREMATORIUM, LLC* : *AUGUST 11, 2017*

**PROPOSED FINAL DECISION**

*I*  
***INTRODUCTION***

On October 15, 2014, Nutmeg State Crematorium, LLC (“Applicant”) submitted applications for two new source review air permits pursuant to relevant sections of Regs., Conn. State Agencies §§ 22a-174-1 et., seq. (“Regulations”), to construct and operate two Matthews Cremation IE43-PPII Plus cremation machines<sup>1</sup>, for the purposes of cremating human remains, to be installed and operated at 35 Commerce Drive in Cromwell (“Applications”). On August 31, 2016, the Department issued notice of its tentative determination to recommend approval of the Applications; notice of that tentative determination was published in the Hartford Courant.

The Coles Brook Commerce Park Owners Association, Inc.; Prime Locations of CT, LLC; Hasson Holdings, LLC; SMS Realty, LLC; C&G Holdings, LLC; and C&G Holdings II, LLC (together, the “intervening parties”) filed a request for hearing on September 30, 2016, along with a motion requesting status as intervening parties pursuant to the Department’s Rules of Practice

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<sup>1</sup> Two permits were required, one for each cremation machine, because each source of air pollution requires its own permit.

and General Statutes § 22a-19. On October 27, 2016, intervening party status was granted pursuant to the Department's Rules of Practice.<sup>2</sup> Regs., Conn. State Agencies § 22a-3a-6(k).

A hearing to receive public comments was held on February 7, 2017 at Cromwell Town Hall. An evidentiary hearing was held on February 28, March 1, and March 2, 2017 at Department Headquarters in Hartford. Allison Tyropolis provided expert testimony on behalf of Department staff. David Krochko, P.E., provided expert testimony for the Applicant, which also introduced fact testimony provided by Luke DiMaria, of Nutmeg State Crematorium, and Ron Salvatore, a representative of Matthews Cremation. The intervening parties presented expert testimony from Eric Epner, P.E., and representatives of the intervening parties provided fact testimony in person or by affidavit. Joint exhibits JNT-1 through JNT-12<sup>3</sup>, Applicant's exhibits APP-1, APP-13, APP-14a, APP-14b and APP-15 through APP-21, Department staff exhibits DEEP-1 through DEEP-6 and Intervening parties exhibits INT-1, INT-5, INT-7, INT-10, INT-23 through INT-30 and INT-34 through 37 were admitted to the evidentiary record as full exhibits.

The Applicant bears the burden of proving that the proposed regulated activities satisfy the statutory and regulatory criteria found in General Statutes § 22a-174 and the relevant implementing regulations. Regs., Conn. State Agencies § 22a-3a-6(f). The intervening parties have identified four primary reasons why the Applications should be denied: 1) the proposed facility is expressly barred by the declaration of easements, covenants and restrictions of the Cole's Brook Commerce Park;<sup>4</sup> 2) the emissions factors chosen to evaluate criteria air pollutants understate the pollutants

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<sup>2</sup> On November 18, 2016, the intervening parties withdrew their request for status as intervening parties pursuant to General Statutes § 22a-19.

<sup>3</sup> Exhibits identified by both the Applicant and intervening parties were consolidated as joint exhibits.

<sup>4</sup> This issue is raised in a section of the intervening parties post-hearing filing entitled "The Applications Were Incomplete and Should Have Been Denied." The intervening parties also raise certain other, less consequential issues,

to be emitted by the proposed facility which, when properly calculated, will violate the statutory and regulatory criteria<sup>5</sup>; 3) a cumulative impact analysis, including the air pollutants discharged by another nearby crematorium, was required but was not performed; and, 4) the proposed crematoriums will emit mercury, a hazardous air pollutant, in excess of the maximum allowable stack concentration, in violation of Regs., Conn. State Agencies § 22a-174-29.

As more fully discussed below, I recommend that the Commissioner deny the Applications and decline to issue the proposed draft permit, because the Applicant has failed to prove that the crematoriums, as proposed, will not emit mercury in excess of the maximum allowable stack concentration calculated pursuant to Regs., Conn. State Agencies § 22a-174-29. Because this recommendation, if adopted, is dispositive, I make no findings and reach no conclusions on the remaining issues raised by the intervening parties at this time.

## *II FACTS*

The following facts are relevant to the issue to be determined:

1. On October 15, 2014, Luke DiMaria, managing member of Nutmeg State Crematorium, LLC, submitted two applications for new stationary source review air permits to construct and operate two Matthews Cremation IE43-PPII Plus cremation machines at property known as 35 Commerce Drive, Cromwell (“Property”). (Ex. JNT-1.)
2. On January 2, 2015, Department staff issued a Notice of Sufficiency, indicating that all necessary application materials had been provided and that Department staff would begin its technical review. While the applicant provided information necessary to perform maximum allowable stack concentration (“MASC”) calculations, the Applicant did not submit such calculations. Application materials were determined to be sufficient even

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regarding the completeness of the Applications, not listed above, in this section. This decision address only compliance with the maximum allowable stack concentration; consideration of these other issues is not necessary to this decision.

<sup>5</sup> The intervening parties also claim that the emission factors used to evaluate hazardous air pollutants were improperly selected. This issue is considered as part of the analysis of whether the proposed crematoriums can be operated in compliance with the maximum allowable stack concentration requirement.

though the Applicant had not provided MASC calculations. (Exs. JNT-2, DEEP-6; test. A. Tyropolis, 3-1-17, pp. 26-32).

3. During the course of the technical review of the Applications, the Applicant agreed to certain modifications to its proposal, including increasing the stack height and limiting the annual hours of operation and, therefore, the amount of material that could be incinerated. As modified, the proposal calls for exhaust stacks of ten meters. The proposed crematoriums can operate no more than 3,262 hours per year, combined. The hourly charge rate, or the rate at which material can be loaded into the crematoriums for incineration, is limited to 175 lbs/hour, for a total of approximately 285 tons of material per year. (Exs. JNT-5, JNT-6.)
4. Mercury, a hazardous air pollutant, is found in amalgam fillings in human remains to be cremated, and is the hazardous air pollutant of primary concern when evaluating the proposed crematoriums. Mercury has a boiling point of approximately 674 degrees Fahrenheit; above this temperature mercury turns to a vapor. The combustion chambers of the proposed crematoriums will operate at 1600 degrees. Mercury from amalgam fillings will be vaporized when human remains are combusted and emitted in the exhaust gas stream from the proposed crematoriums. Exhaust from the cremation process will travel up the stacks and cool to between 1000 and 1100 degrees when exiting the stacks. The exhaust will further cool upon discharge from the stacks and when making contact with the surrounding air. Mercury will exist in its vapor form in the combustion chambers, and most or all mercury in the exhaust will be in its vapor form in the stacks of the proposed crematoriums. The credible expert testimony of Department staff indicates that, as mercury leaves the stacks, it will cool and condense into a particulate before reaching ambient air at the boundaries of the Property. (Ex. DEEP-6; test. A. Tyropolis, 3-1-17, pp. 42-44.)
5. Emissions factors for hazardous air pollutants, essentially constants derived from stack tests or other sources to quantify the amount of a hazardous air pollutant emitted as part of the exhaust stream from incinerating a specific type of waste, are used to determine the amount of a hazardous air pollutant that will be emitted by the proposed crematoriums. Department staff relied on the United States Environmental Protection Agency's ("EPA") webFIRE database to obtain emissions factors for the proposed crematoriums, although there are other sources of emissions factors, including one published by the California Air Resource Bureau ("CARB"). The CARB emissions factor indicates that mercury is emitted from the burning of human remains at a greater rate than the emissions factor found in webFIRE. (Exs. DEEP-6, INT-24; test., 3-1-17, A. Tyropolis, p. 57, E. Epner, p. 68.)
6. Department staff performed MASC calculations and compared them to the emissions from the proposed crematorium for a number of hazardous air pollutants. No MASC calculation was performed for mercury because Department staff determined that mercury should be considered in its particulate form – the form in which it would exist at the property line –

and there is no hazard limiting value – a variable in the MASC calculation – for mercury in its particulate phase. Mr. Epner, the intervening parties’ expert, performed a MASC calculation using the hazard limiting value for mercury in its vapor phase using both the emissions factors from the webFIRE database and the CARB. Using either emissions factor, the proposed crematoriums do not satisfy the MASC for mercury when calculated using mercury in its vapor phase. (Exs. DEEP-6, INT-24; test. E. Epner, 3-1-17, pp. 105-106.)

7. A pre-inspection questionnaire used by the Department for an air pollution inspection indicates that when conducting enforcement activities regarding Rocky Hill Vault, a crematorium near the Property, enforcement staff in the Department’s Air Bureau calculated MASC for the crematorium using mercury in its vapor phase. (Ex. INT-10.)

### ***III CONCLUSIONS OF LAW***

The most contentious issue raised in this matter is the application of the Department’s MASC calculation to exhaust emissions from the proposed crematoriums. Regs., Conn. State Agencies § 22a-174-29(b)(2) states, in relevant part, that “[n]o person, who is required to maintain compliance with a permit under section 22a-174-3a of the Regulations of Connecticut State Agencies shall cause or permit the emission of any hazardous air pollutant listed in Table 29-1, 29-2 or 29-3 of this section from any stationary source . . . at a concentration at the discharge point in excess of the [MASC] . . .” In this matter, the hazardous air pollutant of concern is mercury, which is listed in table 29-3 of the Regulations, in various chemical forms or phases as discussed below.

To determine if the proposed crematoriums will emit mercury in excess of the MASC, the mercury emissions from the proposed crematoriums must first be calculated. This is done using an emissions factor and a charge rate.<sup>6</sup> Once the emissions of mercury is calculated, this amount

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<sup>6</sup> Experts for Department staff and the intervening parties testified that the “charge rate” is the amount of material to be burned in the proposed crematoriums, in this case 175 lbs/hour. The “emissions factor” is the amount of a pollutant

is then compared against the MASC which is calculated using the formula contained in the Regulations. Regs., Conn. State Agencies § 22a-174-29(c)(1)(a). If the emissions of mercury exceed the MASC, the permit cannot be issued; if the opposite is true, the permit can be issued. The issue that divides the parties in this case is how to calculate the MASC.

Department staff calculated the emissions of mercury from the proposed crematorium using an emissions factor from the WebFIRE database published by the EPA and the charge rate found in the Draft Permit.<sup>7</sup>

The method for determining MASC is prescribed by regulation. Regs., Conn. State Agencies § 22a-174-29. The MASC calculation involves a number of variables, including the height of the proposed stack, the distance of the “discharge point” to the property line, the flow rate of exhaust from the stack, and the “hazard limiting value” (“HLV”) assigned to the hazardous air pollutant in question. This is where the approach taken by Department staff and the approach advocated by the intervening party differ.<sup>8</sup> Table 29-3 of the Regulations lists a HLV for mercury in its vapor phase, but not in its particulate phase.<sup>9</sup> For that reason, a MASC for mercury vapor can be calculated using the formula in the Regulations and the HLV in table 29-3. However, a

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expected to be produced by burning material, in this case the amount of mercury expected to be emitted from the burning of human remains.

<sup>7</sup> The intervening parties’ expert, Mr. Epner, advocated for the use of a different emissions factor, published by the California Air Resource Bureau, which would have resulted in a higher calculated mercury emission from the proposed crematorium. Ultimately, the choice of emissions factor does not determine compliance with the Regulations – the emissions of mercury vapor would exceed the calculated MASC using either emissions factor - and so it is not necessary that I make a determination as to which emissions factor to use at this time.

<sup>8</sup> The Applicant did not submit its own MASC calculation, but did submit the information necessary to make such a calculation. The Applicant has indicated that it endorses the approach adopted by Department staff in calculating the MASC for the proposed crematoriums.

<sup>9</sup> The Regulations define “particulate matter” as “any material, except water in uncombined form, that is or has been airborne and exists as a liquid or solid in the ambient air.”

MASC for mercury in its particulate phase cannot be calculated, because there is no HLV for mercury in that phase.

According to Department staff, mercury in its particulate phase will be present at the property line, but mercury vapor will not, so only mercury in its particulate phase must be considered. Under this approach, because there is no HLV for mercury in its particulate phase, in this case the calculation of a MASC and the regulation of mercury as a hazardous air pollutant is not required. I find support for Department staff's approach in the definition of HLV in the Regulations, which states, in relevant part, that "'HLV' means the highest acceptable concentration of a hazardous air pollutant in the *ambient air* . . . ." (Emphasis added.) Regs., Conn. State Agencies § 22a-174-1(51). Because "ambient air" is defined as "that portion of the atmosphere, external to buildings, to which the general public has access." Regs., Conn. State Agencies § 22a-174-1(9). Relying on this definition, Department staff asserts that "ambient air" begins at the property line.<sup>10</sup> HLVs apply only to concentrations of pollutants at the property line, Department staff argues, and therefore, hazardous air pollutants such as the mercury emitted by the proposed crematoriums should be analyzed only in the phase in which they will exist upon reaching the property line.

The boiling point of mercury is approximately 674 degrees Fahrenheit. The cremation units will operate at 1600 degrees Fahrenheit and the temperature of the exhaust as it exits the stack will be between 1000 and 1100 degrees Fahrenheit. While at those temperatures, mercury

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<sup>10</sup> Note that while "ambient air" is a defined term, the definition is somewhat ambiguous. While it appears that Department staff believe that ambient air begins at the property line, it would seem possible that the general public may have access to the air in and around the property on which a source of pollution is located. It is also possible that the property on which a source is located may be surrounded by other private properties to which the general public does not have access. Because "general public" is not a defined term, there may be some question about the meaning of the term ambient air. Resolution of this ambiguity is not necessary in this case.

will almost certainly be in its vapor phase, the exhaust will cool as it leaves the stack and, by the time it reaches the property line, will have almost certainly cooled below the boiling point of mercury, causing the mercury to condense into its particulate phase. For that reason, Department staff concluded that mercury vapor would not reach ambient air at the property line and no MASC calculation for mercury vapor was necessary.

The intervening parties disagree about how MASC should be calculated in this case. They argue that the HLV for mercury in its vapor phase should be used to calculate a MASC, as that is the phase that mercury will almost certainly exist in when it exists the stack as a component of the exhaust stream. The intervening parties also find support for their approach in the Regulations. They argue that Regs., Conn. State Agencies § 22a-174-29(b)(2) requires that emissions of hazardous air pollutants not exceed the MASC at “the discharge point.” The intervening parties argue that the discharge point is the point at which the exhaust leaves the stack; expected exhaust temperatures indicate that mercury will be in its vapor phase at this point. Therefore, the intervening parties assert that a MASC for mercury in its vapor form must be calculated.

This issue must be resolved because it is dispositive in this matter. The evidence in the record indicates that the crematoriums, as currently proposed, cannot comply with the MASC for mercury if calculated using the HLV for mercury vapor; therefore, the intervening parties claim the proposed permit cannot be issued. While the question is a close and difficult one, I recommend that the Commissioner determine that the proposed crematoriums must comply with a MASC calculated using the HLV for mercury as a vapor and therefore that the Commissioner deny the Applications.

MASC regulates the “maximum allowable concentration of a hazardous air pollutant in the exhaust gas stream at the discharge point of a stationary source.” Regs., Conn. State Agencies §

22a-174-1(66). To determine which phase of mercury should be used when calculating a MASC, it is first necessary to determine the “discharge point” of the exhaust from the proposed crematoriums to determine where, exactly, compliance with the MASC must be achieved. “Discharge point” is a defined term in the Regulations, though its definition does not definitively resolve this question. The term is defined to mean “any stack or area from which a hazardous air pollutant is released into the ambient air.” Regs., Conn. State Agencies § 22a-174-1(34). “Stack” is also defined in the Regulations (through incorporating by reference a definition in 40 CFR 51.100(ff)) as “any point in a source designed to emit solids, liquids, or gases into the air, including a pipe or duct but not including flares.” Regs., Conn. State Agencies § 22a-174-1(107). When read in conjunction with the definition of “stack,” “discharge point” is defined to mean any point in a source designed to emit solids, liquids, or gases into the air or an area from which a hazardous air pollutant is released into the ambient air. Applying this definition, it is clear that the discharge point for exhaust from the proposed crematoriums must be the point at which that exhaust exits the stacks.<sup>11</sup>

It is next necessary to determine in which phase mercury will exist at the point at which the exhaust gas stream exits the stack, the point at which compliance with the MASC must be achieved. At that point, the temperature of the exhaust will be between 1000 and 1100 degrees

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<sup>11</sup> It is clear that the discharge point must be where the exhaust exits the stack and not at some other point where it enters the ambient air. This understanding is supported by the Regulations concerning the calculation of MASC. The formula contains a variable, “X”, which is described as “ten (10) meters, or the distance from the ‘discharge point’ to the closest property line, whichever is greater.” Regs., Conn. State Agencies § 22a-174-29(c)(1)(a). If discharge point were defined or intended to mean only that place where the exhaust stream enters the ambient air, the discharge point would always be at the property line. It would, therefore, be impossible for the distance from the “discharge point” to the closest property line to ever exceed ten meters, rendering a portion of the explanation of the MASC calculation superfluous, contrary to the canons of statutory and regulatory construction. See *Turner v. Turner*, 219 Conn. 703, 712 (1991)(Construction of statute must not lead to absurd or unworkable result). In this case, then, where exhaust is being discharged through a stack and travelling some distance to ambient air at the property line, the “discharge point” must be at the point where exhaust exits the stack.

Fahrenheit, well above the temperature necessary to vaporize mercury. There is broad agreement in the record that all, or nearly all, of the mercury in the exhaust stream will be in its vapor phase at this point. Mercury vapor will be in the exhaust gas stream of the proposed crematoriums; a MASC that ensures compliance at the point of discharge must be calculated using mercury in its vapor phase.

In reaching this conclusion, it is important to be cognizant of the consequences of the approach proffered by Department staff. If calculating a MASC for mercury is not required because mercury will be in its particulate phase by the time it reaches the property line, a seemingly limitless amount of mercury could be emitted from stacks without regulation as a hazardous air pollutant. This cannot be the intent of the Regulations.

Choosing to evaluate mercury in its vapor phase is consistent with the interplay between the purposes of MASC and the HLVs. Regulating the MASC for mercury as a vapor has the effect of limiting the amount of mercury particulate that reaches ambient air. If the amount of mercury vapor is regulated at the point of discharge, then the amount of mercury that can cool, condense into a particulate, and reach ambient air at the property boundary is also regulated. A MASC calculated using the HLV for mercury vapor is, in effect, a cap on the amount of mercury that can reach the ambient air in any phase and is more protective of human health and the environment than not calculating a MASC for mercury.

There is also some indication in the record that the Department has, in at least one instance, used the HLV for mercury vapor when calculating a MASC. While I understand that that particular document may have been prepared in a different context and for a different purpose, it does intimate that the approach advocated by Department staff in this matter may not be the approach used in at least one other instance.

In this particular case, the Regulations require a MASC calculation be performed using the HLV for mercury as a vapor. This is also the more protective approach; it will limit the amount of mercury, in any phase, emitted into the ambient air.

***IV***  
***RECOMMENDATION***

For the reasons set out above, I recommend that the Commissioner conclude that the Applicant has not met its burden of proving that the proposed crematoriums comply with the requirements of Regs., Conn. State Agencies § 22a-174-29 and deny the Applications.



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Brendan Schain, Hearing Officer

*S E R V I C E   L I S T*

In the matter of Nutmeg State Crematorium, LLC – 201410139 & 201410892

PARTY

REPRESENTED BY

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