Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

DEVAL L. PATRICK
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Commissioner

May 10, 2012

Mr. Peter Buttkus
Director of Public Works
Town of Duxbury
878 Tremont Street
Duxbury, Massachusetts 02332

RE: Southeast Region
Duxbury
310 CMR 7.02 – Air Quality Non-Major
Mayflower Cemetery Crematory
Comprehensive Plan Application
Transmittal No. X236130
Application No. 4I10036
PLAN APPROVAL

Dear Mr. Buttkus:

The Southeast Regional Office of the Department of Environmental Protection, Bureau of Waste Prevention, ("MassDEP"), has reviewed your Non-Major Comprehensive Plan Application listed above. This Application concerns the installation and operation of four (4) new human crematory units (retorts) at your Facility located at 774 Tremont Street, Duxbury, Massachusetts. The submitted Application bears the seal and signature of Mr. John Kitsalis, Massachusetts P.E. No. 42781.

The application was submitted in accordance with Section 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control Regulations," adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-E, and Chapter 21C, Section 4 and 6.

MassDEP's review has been limited to air pollution regulation compliance and does not relieve you of the obligation to comply with all other permitting requirements.

MassDEP has determined that your Application is administratively and technically complete and that the Application, specifications, and Standard Operating and Maintenance Procedures for the proposed equipment are in conformance with current air pollution control engineering practice, and hereby grants **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Approval carefully, as it stipulates the particular conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in

compliance with the Regulations. Failure to comply with this Approval will constitute a violation of the Regulations and can result in the revocation of the Approval.

1. BACKGROUND AND DESCRIPTION OF FACILITY

The Permittee has proposed the installation and operation of four (4) new crematory retorts at an existing Facility. The four new units will replace the four existing units.

2. EMISSION UNIT IDENTIFICATION

The following emission units (Table 1) are subject to and regulated by this Approval:

Table 1 +

EMISSION UNIT (EU#)	DESCRIPTION OF EMISSION UNIT	EU DESIGN CAPACITY	POLLUTION CONTROL DEVICE (PCD)
EU1	Crematory Retort: Matthews Model IE34-SPPIII Primary Combustion Chamber Burner: Eclipse TJ-150 Secondary Combustion Chamber Burner: Eclipse TJ-150	Primary Combustion Chamber Burner: 0.7 MMBtu/hr Secondary Combustion Chamber Burner: 1.2 MMBtu/hr	Secondary Combustion Chamber
EU2	Crematory Retort: Matthews Model IE34-SPPIII Primary Combustion Chamber Burner: Eclipse TJ-150 Secondary Combustion Chamber Burner: Eclipse TJ-150	Primary Combustion Chamber Burner: 0.7 MMBtu/hr Secondary Combustion Chamber Burner: 1.2 MMBtu/hr	Secondary Combustion Chamber

Table 1 +			
EMISSION UNIT (EU#)	DESCRIPTION OF EMISSION UNIT	EU DESIGN CAPACITY	POLLUTION CONTROL DEVICE (PCD)
EU3	Crematory Retort: Matthews Model IE34-SPPIII Primary Combustion Chamber Burner: Eclipse TJ-150 Secondary Combustion Chamber Burner: Eclipse TJ-150	Primary Combustion Chamber Burner: 0.7 MMBtu/hr Secondary Combustion Chamber Burner: 1.2 MMBtu/hr	Secondary Combustion Chamber
EU4	Crematory Retort: Matthews Model IE34-SPPIII Primary Combustion Chamber Burner: Eclipse TJ-150 Secondary Combustion Chamber Burner: Eclipse TJ-150	Primary Combustion Chamber Burner: 0.7 MMBtu/hr Secondary Combustion Chamber Burner: 1.2 MMBtu/hr	Secondary Combustion Chamber

+ Table 1 Key:

EU# = Emission Unit Number
PCD = Pollution Control Device
MMBtu/hr = million British thermal units per hour

3. APPLICABLE REQUIREMENTS

A. EMISSION LIMITS AND RESTRICTIONS

The Permittee shall comply with the emission limits/restrictions as contained in Table 2 below:

Table 2 [+]

EU#	RESTRICTION / OPERATING PRACTICES	FUEL	POLLUTANT	EMISSION LIMIT / STANDARD Not to exceed		APPLICABLE REGULATION AND / OR APPROVAL NUMBER
EU1, EU2, EU3, EU4	≤ 1,664 Hours / Month ≤ 3.2 $MMft^3$/Month Natural Gas ≤ 19,968 Hours/Twelve Month Rolling Period ≤ 38.0 $MMft^3$/Twelve Month Rolling Period Natural Gas Secondary Chamber Temperature ≥ 1,600 Degrees Fahrenheit	Natural Gas Only	PM	0.06 gr/dscf	0.40 tpm 4.80 tpy	310 CMR 7.02
			PM_{10}	0.06 gr/dscf	0.40 tpm 4.80 tpy	
			$PM_{2.5}$	0.06 gr/dscf	0.40 tpm 4.80 tpy	
			NO_x	68 ppmv	0.46 tpm 5.45 tpy	
			CO	100 ppmv	0.376 tpm 4.54 tpy	
			SO_2	20 ppmv	0.18 tpm 2.18 tpy	
			VOC	110 ppmv	0.256 tpm 3.09 tpy	
			Opacity	≤ 5%, except > 5% to ≤ 20% for ≤ 2 minutes during any one hour		

Hours of operation and natural gas consumption limits are the combined total for all units.

+ Table 2 Key:

EU# = Emission Unit Number
NO_x = Nitrogen Oxides
CO = Carbon Monoxide
SO_2 = Sulfur Dioxide
PM = Total Particulate Matter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
VOC = Volatile Organic Compounds, as propane
tpm = tons per month
tpy = tons per year based on a 12-month rolling period
gr/dscf = grains per dry standard cubic foot, corrected to 7 percent oxygen.
ppmv = parts per million by volume, corrected to 7 percent oxygen.
Opacity = exclusive of uncombined water vapor
$MMft^3$ = million cubic feet
≤ = less than or equal to
≥ = greater than or equal to
% = percent

B. COMPLIANCE DEMONSTRATION

The Permittee shall comply with the monitoring/testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3	
EU#	MONITORING/TESTING REQUIREMENTS
EU1, EU2, EU3, EU4	1. Monitor temperatures in the primary and secondary chambers with Continuous Temperature Monitoring Systems (CTMS) during each complete cremation cycle. A complete cremation cycle shall include burn-down and cool-down time as recommended by the manufacturer, or the time required to consume all combustible material, whichever is greater. Each temperature monitor, or thermocouple, shall be equipped with both an audible and a visual alarm set to alert the operator(s) whenever a temperature deviation occurs. The primary chamber burner shall be electronically interlocked with the secondary chamber thermocouple to prevent ignition of the primary chamber burner or to automatically shut off the primary chamber burner during the burn cycle should the secondary chamber thermocouple detect a temperature less than the minimum required temperature as stated in Table 2 of this Approval.
	2. Monitor opacity of the stack gas with Continuous Opacity Monitoring Systems (COMS) during each complete cremation cycle. A complete cremation cycle shall include burn-down and cool-down time as recommended by the manufacturer, or the time required to consume all combustible material, whichever is greater. Each opacity monitor shall be installed and operated in accordance with 40 CFR Part 60, Appendix B, Performance Specification 1 "Specifications and Test Procedures for Opacity Continuous Emission Monitoring Systems in Stationary Sources." Each opacity monitor shall be equipped with both an audible and a visual alarm set to alert the operator(s) whenever opacity exceeds the limit in Table 2 of this Approval. An electronic interlock shall automatically shut off the primary chamber burner whenever opacity exceeds the limit in Table 2.
	3. The Permittee shall operate the crematory retorts in accordance with the manufacturer's Standard Operating and Maintenance Procedures (SOMP). The Permittee shall check all air pollution control and continuous emission monitoring equipment daily for proper operation and function before proceeding with the cremation process.
	4. The crematory retorts shall be maintained as necessary and kept in good working condition. The temperature and opacity monitoring equipment shall be calibrated at a frequency and maintained in accordance with manufacturer's recommendations to ensure continuous compliance with the temperature and opacity limits in Table 2 of this Approval.
	5. Monitor on a daily, monthly, and twelve month rolling period basis the number of cremations performed in each crematory retort.
	6. Monitor on a monthly and twelve month rolling period basis the natural gas consumption for each crematory retort.

Table 3	
EU#	MONITORING/TESTING REQUIREMENTS
	7. The Permittee shall conduct emissions compliance testing on **one** (1) of the new cremation retorts to demonstrate compliance with the PM, PM_{10}, $PM_{2.5}$, NO_x, CO, and opacity emission limitations as contained in Table 2 of this Approval. All compliance testing for particulate shall include the condensable fraction. The emissions compliance testing shall be conducted within sixty (60) days after the installation of the retorts is completed but no later than 180 days after the first retort is installed and operational. Testing shall be conducted in accordance with the requirements and procedures set forth by appropriate EPA Reference Test Methods, 40 CFR Part 60 Subpart A, 40 CFR Part 51, Appendix M, Air Pollution Control Regulations 310 CMR 7.00, Section 7.13 and this Plan Approval. The opacity testing shall be conducted in accordance with the requirements and procedures as contained in 40 CFR 60 Subpart A, Method 9. The dates and times for conducting the emission tests shall be coordinated with MassDEP personnel of this Office for a mutually agreed upon schedule for testing. As an alternative to emissions compliance testing, the Permittee may provide documentation of satisfactory emissions compliance testing that was conducted on an identical cremation retort in the Commonwealth of Massachusetts within five years prior to the date of submittal of a complete Application.

Table 4	
EU#	RECORD KEEPING REQUIREMENTS
EU1, EU2, EU3, EU4	1. Monitor temperatures continuously in the primary and secondary chambers of each cremation retort during each complete cremation cycle using a computerized data acquisition system and data logger. The data acquisition system shall log at least one data point (for each temperature) every 15 seconds.
	2. Monitor opacity of the stack gas continuously during each complete cremation cycle using a computerized data acquisition system and data logger. The data acquisition system shall log at least one data point every 15 seconds.
	3. All records must identify the cremation retort and show the date, start and end time of each cremation, and shall contain the name of the operator who performed the cremation.
	4. The Permittee shall maintain on site and accessible at or near the subject equipment, at all times, a copy of this Approval letter and the SOMP for all air-emissions-related equipment at the Facility. The SOMP for each crematory retort shall include start-up or pre-heat, cremation loading, and burn-down cycle procedures as well as descriptions of the temperature / monitors, opacity monitors and all interlocks.
	5. The Permittee shall keep on-site records of all preventative or corrective maintenance, calibration checks, adjustments, and evaluations performed on each retort and each retort's temperature and opacity monitors, including dates and detailed descriptions of what was performed.
	6. Record the date and number of cremations performed each day in each crematory retort. Use this data to calculate the number of cremations performed on a monthly and twelve month rolling period basis in each crematory retort.
	7. Record on a monthly and twelve month rolling period basis the natural gas consumption for each crematory retort.
	8. The Permittee shall maintain adequate records on-site to demonstrate compliance with the emission limits as stated in Table 2 of this Approval. At a minimum, the information shall include the calculated Facility emissions for the month as well as the prior 11 months. The MassDEP approved On-Site Record Keeping Form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/dep/air/approvals/reshome.htm#forms

Table 4	
EU#	RECORD KEEPING REQUIREMENTS
	9. The Permittee shall maintain on-site documentation, including dated operator's certificates, showing that each operator at the Facility has received training in the proper operation and in the manufacturer's SOMP for said retorts. Said documentation shall be kept on site throughout each operator's employment as well as for at least five (5) years after termination of employment.
Facility Wide	10. The Permittee shall maintain records for the preparation of a Source Registration/Emission Statement Form as required by 310 CMR 7.12.
	11. The Permittee shall maintain all records or reports required by this Approval on site for five (5) years.

Table 5	
EU#	REPORTING REQUIREMENTS
EU1, EU2, EU3, EU4	1. The Regional Office of MassDEP, BWP Compliance and Enforcement Chief, must be notified by telephone as soon as possible, within but no later than one (1) business day, after the occurrence of any upsets or malfunctions to Facility equipment which result in an excess emission (including opacity) to the air and/or a condition of air pollution, with written notice to be submitted seven (7) days thereafter. Said report shall include identification, duration, and reason for the exceedance(s), and a remedial action plan to prevent future exceedance.
	2. The Permittee shall submit to MassDEP any changes to the SOMP within seven (7) days of commencement of the modification(s).
	3. A written pretest protocol shall be submitted to this Office for written approval by MassDEP at least 30 days prior to the actual test. The pretest protocol shall include, but not be limited to, a description of the emissions compliance testing program proposed, applicable emission limits for which testing and demonstration of compliance is required, sampling point locations, sampling equipment, analytical procedures, proposed test methods, the proposed operating conditions for the required testing and identity of the independent third party testing company.
	4. A final emissions compliance test results report shall be submitted to this Office within 30 days after completion of the required compliance testing. The final emissions compliance testing report shall include, but not be limited to, a description of the emission compliance testing program conducted, applicable emission limits for which testing was required and a summary of test results demonstrating compliance with and/or noncompliance with applicable limits, sampling point locations, sampling point locations, sampling equipment, analytical procedures, actual test methods used, the actual operating conditions for which the testing was conducted and identity of the independent third party testing company.
Facility Wide	5. The Permittee shall accurately report to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note any minor changes, which did not require Plan Approval (under 310 CMR 7.02, 7.03, etc.) therein.
	6. All records shall be made available to representatives of MassDEP upon request.

4. SPECIAL TERMS AND CONDITIONS

The Permittee is subject to the following special terms and conditions:

a) The Permittee shall install and utilize exhaust stacks with the following parameters (Table 6) for its subject emission units that are regulated by this Approval. Each exhaust shall

not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including, but not limited to "shanty caps" and "egg beaters."

Table 6

EU#	Minimum Stack Height Above Ground Level (feet)	Minimum Stack Height Above Roof (feet)	Stack Exit Size (inches)	Minimum Exhaust Gas Exit Velocity (feet/second)	Exhaust Gas Temperature (Degrees Fahrenheit)
EU1, EU2, EU3, EU4	24	8	20	17	900

b) The Permittee shall implement an Operator Training Program to train personnel who will be operating any of the crematory retorts in the proper operation and in the manufacturer's SOMP for said retorts. Said training shall be given by a representative from the manufacturer of the crematory retort or another qualified organization. The training shall include the following elements: a) principles of combustion; b) operating monitors and controls; c) operating sequence under normal conditions; d) safety and operating procedures under foreseeable upset conditions (e.g. power or fuel interruption, burner malfunction, visible emissions, high and low temperature incidents, etc.); e) regulatory requirements; f) calibration, adjustment and replacement of thermocouples; g) preventative maintenance practices and procedures and recommended frequency; h) record keeping requirements and procedures; and i) calibration, adjustment and replacement of opacity monitors in accordance with 40 CFR Part 60, Appendix A Performance Specification 1. Minimum training criteria shall include hands-on control of the retort for at least two (2) operating cycles in order to complete the program and receive an operator's certificate. All training shall be equipment specific. If an existing crematory retort is modified, the operator(s) must be re-trained to operate the modified retort.

c) The Permittee shall have an operator who has completed the Operator Training Program present at all times during cremations. The cremation operator shall take any necessary action, including shutdown of the equipment, to ensure that the Facility operates in compliance with the temperature and opacity limits contained within this Approval.

d) The Permittee shall utilize the crematory retort(s) only for human remains and its container. No other material shall be incinerated in the crematory retort(s).

e) The thermocouple in each retort's secondary chamber must be located at a position that defines a chamber volume, as measured between the secondary chamber burner and the downstream thermocouple, sufficient to provide a minimum exhaust gas residence or retention time of 1.0 second at 1,800 degrees Fahrenheit.[1]

[1] Minimum operating temperature of the secondary chamber shall be maintained in accordance with Table 2 of this Approval.

f) The thermocouple in each retort's primary and secondary chamber shall be located at the exit end of each combustion zone in order to measure each chamber's representative temperature and not be otherwise impacted by the flame's radiant heat effect.

g) In the event of a malfunction or breakdown of a retort or the associated monitoring equipment, the Permittee shall not initiate any new cremations in said retort until repairs are completed and normal operation can be restored.

h) The Permittee shall incinerate only containers, including cremation pouches that contain no chlorinated plastics.

i) This Plan Approval supersedes the following Department approvals:

- 4I90172 dated November 15, 1990, and
- MBR-80-INC-005 dated April 30, 1980.

The listed approvals shall be deemed null and void when the associated retorts are decommissioned.

5. GENERAL CONDITIONS

The Permittee is subject to the following general conditions:

a) Should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur, as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps, including shutdown if necessary, to abate said nuisance condition(s).

b) If asbestos remediation/removal should be required as a result of the approved construction, reconstruction, or alteration of this Facility, removal/remediation of asbestos shall be done in accordance with Regulation 310 CMR 7.15 in its entirety and 310 CMR 4.00.

c) The Permittee shall allow MassDEP and/or EPA personnel access to the Facility, buildings, and all pertinent records at all times for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

d) Be advised that this Plan Approval does not negate the responsibility of the Permittee to comply with other applicable Federal, State, or local regulations now or in the future. Nor does this Approval imply compliance with this or any other applicable federal, state, or local regulations now or in the future.

e) This Plan Approval may be suspended, modified, or revoked by MassDEP if, at any time, MassDEP determines that the Permittee is violating any condition or part of this Plan Approval.

f) Any proposed increase in emissions above the limits contained in this Plan Approval must first be approved in writing by MassDEP pursuant to MassDEP's Air Pollution Control Regulations 310 CMR 7.02(5)(a). In addition, any increase may subject the Facility to additional regulatory requirements.

g) The ability of the Permittee to maintain emission rates at or below the levels stated in this Plan Approval shall be demonstrated to MassDEP in the future if deemed necessary.

h) Any future compliance tests that may be required at this Facility shall be conducted in accordance with procedures set forth by the appropriate EPA Reference Test Methods and Air Pollution Control Regulations, 310 CMR 7.00, Section 7.13. A written pretest protocol must be submitted to this Office for written MassDEP approval at least 30 days prior to the actual test. A test results report shall be submitted to this Office within 30 days after the completion of any required compliance testing.

i) This Approval consists of the Application materials and this Approval letter. If conflicting information is found between these two documents, then the requirements of the Approval letter shall take precedence over the documentation in the Application materials.

j) Failure to comply with any of the above stated conditions will constitute a violation of the "Regulations", and can result in the revocation of the Approval granted herein and/or other appropriate enforcement action as provided by law. MassDEP may also revoke this Approval if the construction work is not begun within two years from the date of issuance of this Approval, or if the construction work is suspended for one year or more.

k) MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and Regulation 301 CMR 11.00, Section 11.04, provide certain "Fail-Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

6. APPEAL PROCESS

This Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date you received this Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection (MassDEP)
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Approval, please contact Thomas Cushing by telephone at (508) 946-2824, or in writing to the MassDEP at the letterhead address.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

_____

John Winkler
Permit Chief

cc: Duxbury Board of Health
Duxbury Fire Department
Matthews Cremation, Attn: M. Tricoche
MassDEP/Boston - Yi. Tian
DEP/SERO, Attn: L. Carlson
L. Black