Notice of Construction (NOC) Worksheet

PUGET SOUND
Clean Air Agency

Source: Woodlawn Abbey Mausoleum	**NOC Number:** 12158
Installation Address: 12421 Valley Ave E | Puyallup, WA 98372	**Registration Number:** 28391
Contact Name: Corey Gaffney	**Contact Email:** corey@ gaffney.group
Applied Date: 06/14/2021	**Contact Phone:** (253) 232-0441
Engineer: Carl Slimp	**Inspector:** Wellington Troncoso

A. DESCRIPTION

For the Order of Approval:
Woodlawn Abbey Mausoleum is proposing to install one Facultatieve Technologies Model FT III SE Human Crematory ("the crematory") at their Puyallup facility. This unit is rated at 200 lbs/hr and to use 2.1 MMBTu/hr of Natural Gas.

Facility
The Facultatieve Technologies Model FT III SE Human Crematory will be replacing one Therm Tec Human Crematory, Model SQC-300 rated at 100 lbs/hour at 3.5 Million BTUH using Natural Gas. This unit is currently permitted under NOC# 10480, which will be replaced by this NOC. This unit was previously permitted under NOC# 9812 at a different location.

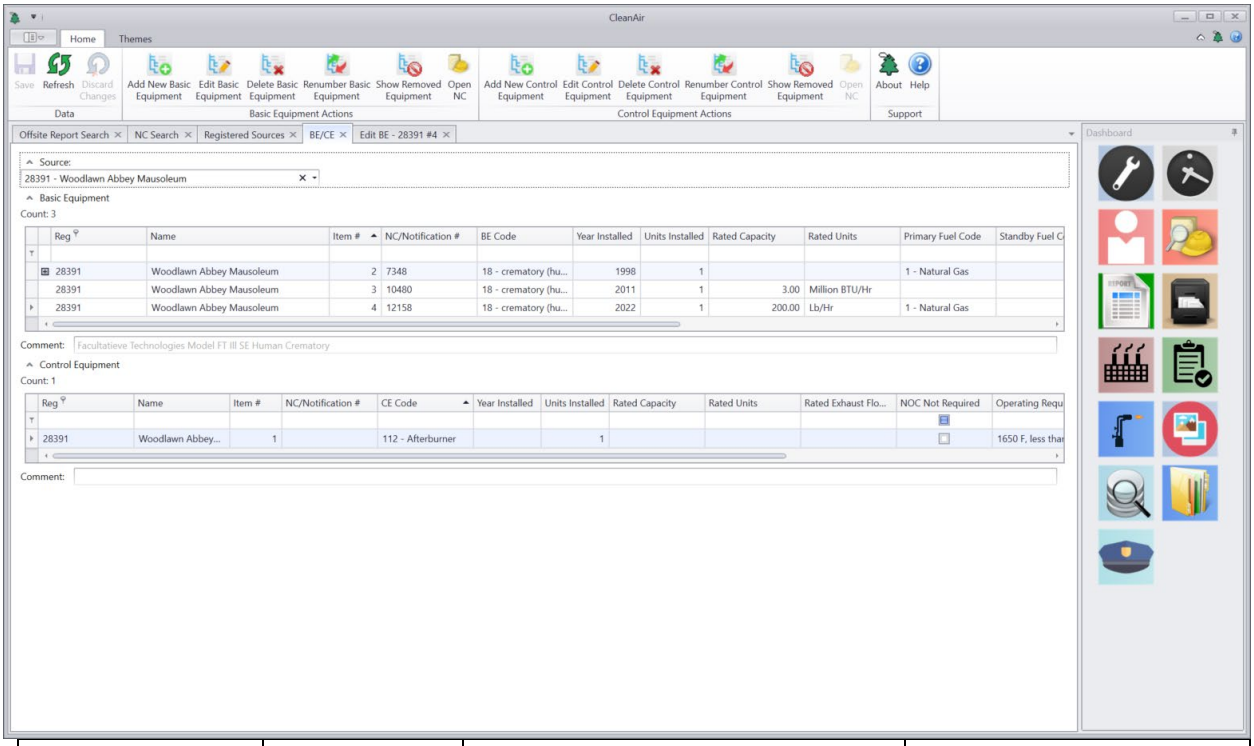
Permit History

Woodlawn Abbey Mausoleum previously operated under Reg 28391.

NC	Reg	Reg Source Name	BE Codes	Approval Date
2283	28391	Woodlawn Abbey Mausoleum		1/3/1982
2548	28391	Woodlawn Abbey Mausoleum		5/1/1984
7348	28391	Woodlawn Abbey Mausoleum	18	5/5/1998
10480	28391	Woodlawn Abbey Mausoleum	18	8/2/2012

Woodlawn Abbey Mausoleum is proposing to install one Facultatieve Technologies Model FT III SE Human Crematory ("the crematory") at their Puyallup facility.

B. DATABASE INFORMATION



New NSPS due to this NOCOA?	**No**	**Applicable NSPS:**	**Delegated?**
New NESHAP due to this NOCOA?	**No**	**Applicable NESHAP:**	**Delegated?**
New Synthetic Minor due to this NOCOA?	**No**		

C. NOC FEES AND ANNUAL REGISTRATION FEES

NOC Fees:

Fees have been assessed in accordance with the fee schedule in Regulation I, Section 6.04. All fees must be paid prior to issuance of the final Order of Approval.

Fee Description	Cost	Amount Received (Date)
Filing Fee	$ 1,550	
Equipment (6.04a)	$ 650	
SEPA (DNS)	$ 900	
Review of Engineering Source Testing submitted in support of application	$ 1,000	
Screening Dispersion Modeling Analysis performed by Agency (not provided by applicant)	$1,500	
Public Notice	$750	
Filing received		$ 1,550 (6/21/21)
Additional fee received		$ 4,800 (5/11/22)
Total	**$ 6,300**	

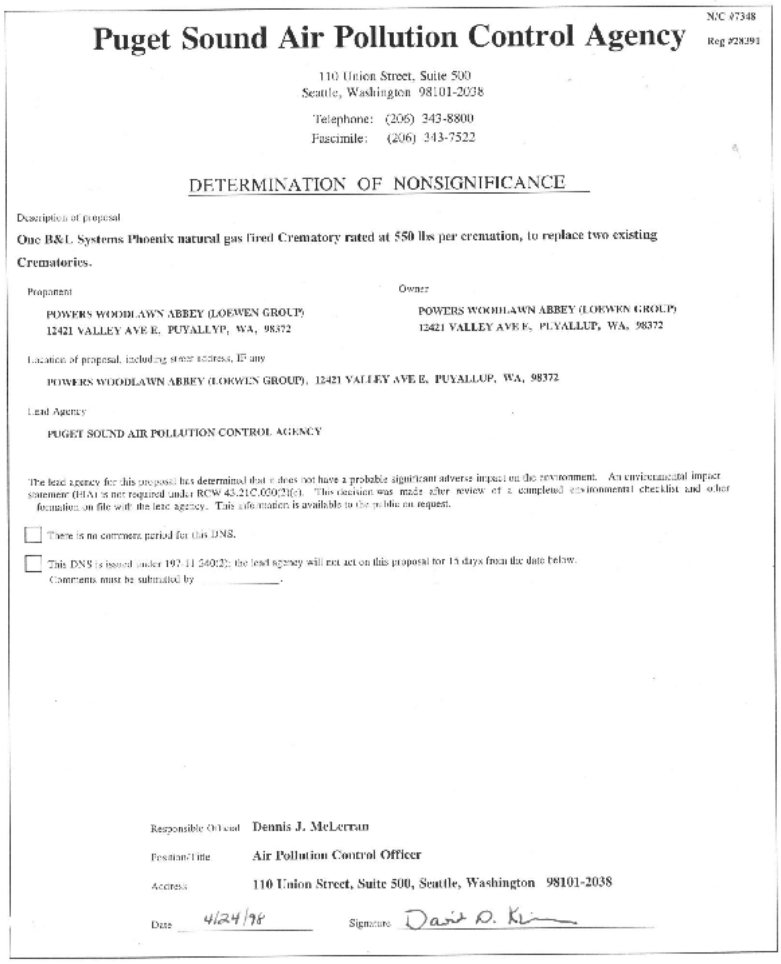
Registration Fees:
Registration fees are assessed to the facility on an annual basis. Fees are assessed in accordance with Regulation I, Section 5.07.

2021 Registration Fees

D. STATE ENVIRONMENTAL POLICY ACT (SEPA) REVIEW

State Environmental Policy Act (SEPA) review was conducted in accordance with Regulation I, Article 2. The SEPA review is undertaken to identify and help government decision-makers, applicants, and the public to understand how a project will affect the environment. A review under SEPA is required for projects that are not categorically exempt in WAC 197-11-800 through WAC 197-11-890. A new source review action which requires a NOC application submittal to the Agency is not categorically exempt.

Jeffrey Wilson was reached out to on June 28, 2021, and replied that this was not within Sumner city limits. Adonais Clark with Pierce County was reached out to on April 25, 2022 and replied that it was within Sumner city limits. Below is the previous DNS assigned by PSCAA on 4/24/98.



N/C #7348
Reg #28393

Puget Sound Air Pollution Control Agency

110 Union Street, Suite 500
Seattle, Washington 98101-2038

Telephone: (206) 343-8800
Facsimile: (206) 343-7522

DETERMINATION OF NONSIGNIFICANCE

Description of proposal

One B&L Systems Phoenix natural gas fired Crematory rated at 550 lbs per cremation, to replace two existing Crematories.

Proponent

POWERS WOODLAWN ABBEY (LOEWEN GROUP)
12421 VALLEY AVE E. PUYALLYP, WA, 98372

Owner

POWERS WOODLAWN ABBEY (LOEWEN GROUP)
12421 VALLEY AVE E, PUYALLUP, WA, 98372

Location of proposal, including street address, if any

POWERS WOODLAWN ABBEY (LOEWEN GROUP), 12421 VALLEY AVE E, PUYALLUP, WA, 98372

Lead Agency

PUGET SOUND AIR POLLUTION CONTROL AGENCY

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☐ This DNS is issued under 197-11-340(2); the lead agency will not act on this proposal for 15 days from the date below. Comments must be submitted by _____.

Responsible Official: Dennis J. McLerran
Position/Title: Air Pollution Control Officer
Address: 110 Union Street, Suite 500, Seattle, Washington 98101-2038
Date: 4/24/98 Signature: David D. Kl

Form 63-175, (1/89)

PSCAA is the SEPA lead agency for this project. The applicant submitted a completed Environmental checklist that is included below.

Environmental Check LIst.pdf

Based on the proposed action and the information in the checklist, the project will not: adversely affect environmentally sensitive or special areas, or endangered or threatened species; conflict with local, state, or federal laws or requirements for the protection of the environment, or establish a precedent for future actions with significant effects. This proposal is not likely to have a probable significant adverse environmental impact, and I recommend the issuance of a Determination of Non-Significance.

E. TRIBAL CONSULTATION

On November 21, 2019, the Agency's Interim Tribal Consultation Policy was adopted by the Board. Criteria requiring tribal consultation are listed in Section II.A of the policy and include establishment of a new air operating permit source, establishment of a new emission reporting source, modification of an existing emission reporting source to increase production capacity, or establishment or modification of certain equipment or activities. In addition, if the Agency receives an NOC application that does not meet the criteria in Section II.A but may represent similar types and quantities of emissions, the Agency has the discretion to provide additional consultation opportunities.

This project does not meet any of the criteria for consultation listed in Section II.A of the Agency's Interim Tribal Consultation Policy.

F. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) REVIEW

Best Available Control Technology (BACT)

New stationary sources of air pollution are required to use BACT to control all pollutants not previously emitted, or those for which emissions would increase as a result of the new source or modification. BACT is defined in WAC 173-400-030 as, "an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under Chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant."

An emissions standard or emissions limitation means "a requirement established under the Federal Clean Air Act or Chapter 70.94 RCW which limits the quantity, rate, or concentration of emissions of air contaminants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction and any design, equipment, work practice, or operational standard adopted under the Federal Clean Air Act or Chapter 70.94 RCW."

Origin	Emissions Limitation	Operational and Design Limitation
PSCAA (No 11869)	**$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.06 grains per dry standard cubic foot corrected to 7% O_2 **Visible Emissions:** ▪ Visible emissions shall not exceed 5% for more than 3 minutes in any 1 hour **NO_x:** ▪ NOx concentration shall not exceed 140 ppmv corrected to 7% O_2 dry basis **CO:** CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ A minimum secondary chamber residence time of 1.2 seconds or more **Visible Emissions:** ▪ Implementation of an opacity monitoring system and temperature control system interlocked to a combustion control system **SO_2:** ▪ Combustion of natural gas ▪ 651,000 lbs 12-month rolling average limit
PSCAA (No. 11808)	**$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.06 grains per dry standard cubic foot corrected to 7% O_2 **Visible Emissions:** ▪ Visible emissions shall not exceed 5% for more than 3 minutes in any 1 hour **NO_x:** ▪ NOx concentration shall not exceed 140 ppmv corrected to 7% O_2 dry basis **CO:** ▪ CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ Secondary chamber temperature interlock set point at 1,650 degrees Fahrenheit ▪ A minimum secondary chamber residence time of 1.2 seconds or more **Visible Emissions:** ▪ Implementation of an opacity monitoring system and temperature control system interlocked to a combustion control system **SO_2:** ▪ Combustion of natural gas

Origin	Emissions Limitation	Operational and Design Limitation
PSCAA (No. 11670)	**$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.06 grains per dry standard cubic foot corrected to 7% O_2 **Visible Emissions:** ▪ Visible emissions shall not exceed 5% for more than 3 minutes in any 1 hour **NO_x:** ▪ NOx concentration shall not exceed 140 ppmv corrected to 7% O_2 dry basis **CO:** ▪ CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ Secondary chamber temperature interlock set point at 1,650 degrees Fahrenheit ▪ A minimum secondary chamber residence time of 1.2 seconds or more **Visible Emissions:** ▪ Implementation of an opacity monitoring system and temperature control system interlocked to a combustion control system **SO_2:** ▪ Combustion of natural gas
PSCAA (No. 11540)	**$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.06 grains per dry standard cubic foot corrected to 7% O_2 **Visible Emissions:** ▪ No visible emissions during daylight operation **NO_x:** ▪ NOx concentration shall not exceed 60 ppmv corrected to 7% O_2 dry basis **CO:** ▪ CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ Secondary chamber temperature interlock set point at 1,650 degrees Fahrenheit ▪ A minimum secondary chamber residence time of 1.2 seconds or more **Visible Emissions:** ▪ Implementation of an opacity monitoring system and temperature control system interlocked to a combustion control system **SO_2:** ▪ Combustion of natural gas

Origin	Emissions Limitation	Operational and Design Limitation
PSCAA (No. 11376)	**$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.06 grains per dry standard cubic foot corrected to 12% CO_2 **Visible Emissions:** ▪ No visible emissions during daylight operation **NO_x:** ▪ NO_x concentration shall not exceed 60 ppmv corrected to 7% O_2 dry basis **CO:** ▪ CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ Secondary chamber temperature interlock set point at 1,650 degrees Fahrenheit ▪ A minimum secondary chamber residence time of 1.2 seconds or more **Visible Emissions:** ▪ Implementation of an opacity monitoring system and temperature control system interlocked to a combustion control system **SO_2:** ▪ Combustion of natural gas
TCEQ	**$PM_{2.5}$, PM_{10}, TSP:** ▪ PM: Visible emissions shall not exceed 5.0% opacity averaged over a six minute period	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ Secondary chamber is heated by a natural gas/propane fired burner and fires at twice the heat rate of the primary chamber burner ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ A minimum secondary chamber flue gas residence time of 0.5 seconds or more **Visible Emissions, CO:** ▪ Cremators without continuous opacity or carbon monoxide monitors are limited to operating from one-hour after sunrise to one-hour before sunset **SO_2:** ▪ Combustion of natural gas

Origin	Emissions Limitation	Operational and Design Limitation
MassDep (No. SE-14-003)	**Visible Emissions:** ▪ Visible emissions shall not exceed 5% opacity except when 5% to 20% for < 2 consecutive minutes during any one hour **$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.060 grains per dry standard cubic foot corrected to 7% O_2 **NO_x:** ▪ NO_x concentration shall not exceed 200 ppmv corrected to 7% O_2 dry basis **CO:** ▪ CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 ºF during cremation cycle **SO_2:** ▪ Combustion of natural gas
MaineDep (No. A-818-71-C-R)	**VOC:** ▪ VOC emissions shall not exceed 0.130 lbs per hour **Visible Emissions:** ▪ Visible emissions shall not exceed 10.0% opacity based on a six minute block average basis **$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not exceed 0.920 lbs per hour **NO_x:** ▪ NO_x emissions shall not exceed 0.350 lbs per hour **CO:** ▪ CO emissions shall not exceed 0.230 lbs per hour **SO_2:** ▪ SO_2 emissions shall not exceed 0.370 lbs per hour	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ A minimum secondary chamber flue gas residence time of 0.5 seconds or more **SO_2:** ▪ Combustion of natural gas
SMAQMD (No. 145)	**NO_x:** ▪ NO_x concentration shall not exceed 60 ppmv corrected to 3% O_2 dry basis (natural gas combustion only with no charge)	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle **SO_2:** ▪ Combustion of natural gas

Origin	Emissions Limitation	Operational and Design Limitation
SCAQMD (BACT Guidelines for Non Major Polluting Facilities, Page 36)	None	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,500 degrees Fahrenheit ▪ Operation imitations only apply to PM_{10} – none for $PM_{2.5}$ **SO_2:** ▪ Combustion of natural gas
BAAQMD (BACT Guideline – Crematory)	None	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ A minimum secondary chamber temperature of 1,600 ºF (set point at 1,650) ▪ Limitations only apply to PM_{10} – none for $PM_{2.5}$ **SO_2:** ▪ Combustion of natural gas

Best Available Control Technology for Toxics (tBACT)

New or modified sources are required to use tBACT for emissions control for TAP. Best available control technology for toxics (tBACT) is defined in WAC 173-460-020 as, "the term defined in WAC 173-400-030, as applied to TAP."

SWCAA (ADP 17-3240R1)	**NO_x:** ▪ NO_x concentration shall not exceed 140 ppmv corrected to 7% O_2 **CO:** ▪ CO concentration shall not exceed 40 ppmv corrected to 7% O_2 **Visible Emissions:** ▪ Visible emissions shall not exceed 5% opacity for more than three minutes during the initial 15 minutes of the cremation cycle and 0% opacity for more than three minutes during any-1hour period after the initial 15-minute period.	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ Minimum afterburner temperature of 1,500ºF during the entire cremation process ▪ Prior to charging the primary chamber, afterburner must reach a minimum of 1,600ºF for a period of at least 30 minutes ▪ A minimum afterburner residence time of 0.5 seconds or more **SO_2:** ▪ Combustion of natural gas

SWCAA (ADP 18-3308)	**NO_x:** ▪ NO_x concentration shall not exceed 140 ppmv corrected to 7% O_2 **CO:** ▪ CO concentration shall not exceed 40 ppmv corrected to 7% O_2 **Visible Emissions:** ▪ Visible emissions shall not exceed 5% opacity for more than three minutes during the initial 15 minutes of the cremation cycle and 0% opacity for more than three minutes during any-1hour period after the initial 15-minute period.	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Dual-chambered cremator design ▪ Minimum afterburner temperature of 1,500ºF during the entire cremation process ▪ Prior to charging the primary chamber, afterburner must reach a minimum of 1,600ºF for a period of at least 30 minutes ▪ A minimum afterburner residence time of 0.5 seconds or more **SO_2:** ▪ Combustion of natural gas
MDEQ (No. 3236-04)	**Visible Emissions:** ▪ Visible emissions shall not exhibit an opacity of 10% or greater averaged over 6 consecutive minutes **$PM_{2.5}$, PM_{10}, TSP:** ▪ PM emissions shall not cause an excess of 0.10 grains per dry standard cubic feet (gr/dscf) corrected to 12% carbon dioxide (CO2)	**$PM_{2.5}$, PM_{10}, TSP, Visible Emissions, NO_x, CO, VOC:** ▪ Proper crematorium design and operation relying on good turbulence, high temperature and gas residence time within the secondary combustion chamber: 1. Turbulence is achieved with proper introduction of air into the combustion chambers 2. Temperature in the secondary chamber must be maintained at an operating temperature of 1,500 degrees Fahrenheit with no single reading less than 1,400 degrees Fahrenheit 3. The gas residence time in the secondary chamber and flue stack must be over 1.2 seconds ▪ Operating procedures, design including temperature and timer interlocks to ensure proper combustion ▪ Flame monitoring for both the primary and secondary chamber burners ▪ Smoke control managed by automatically detecting rate of temperature rise within the primary chamber and adding additional secondary chamber combustion air **SO_2:** ▪ Combustion of natural gas

Analysis & Recommendations

Pollutant	Available Method That Meets BACT	Implementation of Method
VOCs including volatile TAPs	None	▪ Dual-chambered cremator design ▪ Combustion of natural gas ▪ A minimum secondary chamber temperature of 1,600 degrees Fahrenheit during cremation cycle ▪ Implementation of an opacity monitoring system and temperature control system interlocked to a combustion control system with an audible alarm ▪ Secondary chamber residence time sufficient to meet emission limitations
PM including non-volatile TAPs	PM emissions shall not exceed 0.06 grains per dry standard cubic foot corrected to 7% O_2	
NO_x	NOx concentration shall not exceed 140 ppmv corrected to 7% O_2 dry basis	
CO	CO concentration shall not exceed 50 ppmv corrected to 7% O_2 dry basis	
SO_2	None	

G. EMISSION ESTIMATES

Proposed Project Emissions

Actual Emissions

The applicant provided the emissions estimate included below.

POLLUTANT	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	ton/yr		SQER		lb/case	lb/hr
Carbon monoxide	2.95E+00	Lb	Tons	Medical W	Burned	0.27	1-hour	43		2.12E-01	7.97E-02
Nitrogen oxides (I	3.56E+00	Lb	Tons	Medical W	Burned	0.33	1-hour	0.87		2.56E-01	9.61E-02
PM, primary	4.67E+00	Lb	Tons	Medical W	Burned	0.43				3.36E-01	1.26E-01
PM10, filterable	3.04E+00	Lb	Tons	Medical W	Burned	0.28				2.19E-01	8.21E-02
PM2.5, filterable	2.02E+00	Lb	Tons	Medical W	Burned	0.19				1.46E-01	5.46E-02
Sulfur dioxide	2.17E+00	Lb	Tons	Medical W	Burned	0.20	1-hour	1.2		1.56E-01	5.86E-02
Total organic com	2.99E-01	Lb	Tons	Medical W	Burned	0.03					
	5.35E+02	lb/case				682.95					
	lb/case										
	144				based on full operation (8760)						
	Proposed increase cases per year			2555	2555						
	Cases per shift (8-10 hr shift)			3	3						
	Hours per shift (conservative)			8	8						
		Shifts per day		3	3						

FTIII Cremator Emissions.pdf

The criteria pollutants would all be below reporting thresholds at maximum capacity.

Potential Emissions

The permitted potential to emit calculations are based on operating at 100% rated capacity and 8,760 hour per year and 20 cases a day. The estimated emissions above would be the potential emissions.

Facility-wide Emissions

Actual Emissions
Reporting Source? No

Woodlawn Abbey Mausoleum also has one B&L Systems Phoenix natural gas fired Crematory permitted under NOC 7348. Its emission estimates were 0.16 tons/year of Particulates, 0.04 tons/year of NOx and 0.41 tons/year of CO.

If added to the permitted unit, these would all still be below reporting thresholds.

Potential Emissions
Woodlawn Abbey Mausoleum will be taking a production limit calculated above to control emissions.

H. OPERATING PERMIT OR PSD

The Title V Air Operating Permit (AOP) program applicability for the entire source has been reviewed.

The facility is not a Title V air operating permit source because post project PTE remains below Title V applicability thresholds and criteria. The source is considered a "**natural minor**".

I. AMBIENT TOXICS IMPACT ANALYSIS

The estimated potential toxic air pollutant (TAP) emissions at operating at 100% rated capacity and 8760 hour per year for each new or modified emission unit which would be 20 cases per day. The table below includes estimated potential emissions of all TAP and compares those to the Small Quantity Emission Rates (SQER) in WAC 173-460-150.

Based on the source tests submitted, the following TAP emissions were calculated based on 20 cases/day.

Compound	reported lb/hr*	SQER	averaging period	Reporting Averaging period	Pass (Yes/No)
Arsenic	3.13E-06	4.90E-02	Year	2.74E-02	Yes
Beryllium	2.31E-06	6.80E-02	year	2.02E-02	Yes
Cadmium	3.19E-05	3.90E-02	year	2.79E-01	No
Chromium VI	5.68E-06	6.50E-04	year	4.98E-02	No
Cobalt	2.17E-07	7.40E-03	24-hr	5.21E-06	Yes
Copper	1.91E-04	1.90E-01	hour	1.91E-04	Yes
Lead	1.33E-04	1.40E+01	year	1.17E+00	Yes
Manganese	8.33E-06	2.20E-02	24-hr	2.00E-04	Yes
Mercury	8.45E-05	2.20E-03	24-hr	2.03E-03	Yes
Nickel	2.09E-05	6.20E-01	year	1.83E-01	Yes
Selenium	7.74E-06	1.50E+00	24-hr	1.86E-04	yes
Hydrogen Chloride	4.80E-02	6.70E-01	24-hr	1.15E+00	no
Benz(a)pyrene	1.94E-08	1.60E-01	year	1.70E-04	yes
Vanadium	3.86E-05	7.40E-03	24-hr	3.86E-05	Yes
Hydrogen Fluoride	4.37E-04	1.00E+00	24-hr	1.05E-02	yes

*These numbers came from FTIII Cremator Emissions. It looks like there is an issue of conversion from the average g/hr sited in the column over.

Cadmium, Chromium and Hydrogen Chloride are all above SQER rates above this limit. When modeled, HCl passed ASIL rates. This modeling will be included in supporting documents.

Compound	Emission Rate	Tier 1	ASIL	
	(g/s)	ug/m3	ug/m3	
Hydrogen Chloride	2.90E-03	2.102	9	Pass

Cadmium and Chromium both fail Tier 1 modeling by both Carl Slimp at PSCAA and Cheryl Roberts at Verdeantas. Reduced rates were checked, and based off of the source tests for representative unit, one case per day would still exceed ASIL for Chromium. With that in mind, Woodlawn Cemetery will take credit for the reduction in actual emissions associated with removing the crematory furnace that this shall be replacing, consistent with WAC 173-460-080. They report a total of 1025 cases during 2019 and 1022 cases during 2020.

Existing Unit vs. FTIII Cremator Criteria and

Crematory emissions are generally considered case by case, 1023 cases per year will be a new limit, and the addition applied to the SQER limits shall be zero satisfying WAC 173-460-080(3):

(3) Reduction of TAPs from existing emission units. An applicant may include in an acceptable source impact analysis proposed reductions in actual emissions of a particular TAP from emission units at the source that are not new or modified for the purpose of offsetting emissions of that TAP caused by the new or modified source. The reductions in TAP emissions authorized by this subsection must be included in the approval order as enforceable emission limits and must meet all the requirements of WAC 173-460-071.

WAC 173-460-071 reads:
Voluntary limits on emissions.
(1) If requested by an applicant, the permitting authority may issue a regulatory order that limits emissions of a particular TAP to a level that is lower than the potential emissions of that particular TAP otherwise allowed under all applicable requirements of chapter 70.94 RCW and the federal Clean Air Act.
(2) Any order issued under this section is subject to the notice and comment procedures in WAC 173-400-171 or the permitting authority's public notice and commenting procedures.
(3) Any order issued under this section must include monitoring, recordkeeping, and reporting requirements sufficient to ensure that the applicant complies with any conditions established under this section. Monitoring requirements must use terms, test methods, units, averaging periods, and other statistical conventions consistent with the requirements of WAC 173-400-105.

This shall be satisfied by tracking cases per year.

J. APPLICABLE RULES & REGULATIONS
Puget Sound Clean Air Agency Regulations

SECTION 5.05 (c): The owner or operator of a registered source shall develop and implement an operation and maintenance plan to ensure continuous compliance with Regulations I, II, and III. A copy of the plan shall be filed with the Control Officer upon request. The plan shall reflect good industrial practice and shall include, but not be limited to, the following:
(1) Periodic inspection of all equipment and control equipment;
(2) Monitoring and recording of equipment and control equipment performance;
(3) Prompt repair of any defective equipment or control equipment;
(4) Procedures for startup, shut down, and normal operation;
(5) The control measures to be employed to ensure compliance with Section 9.15 of this regulation; and
(6) A record of all actions required by the plan.
The plan shall be reviewed by the source owner or operator at least annually and updated to reflect any changes in good industrial practice.

SECTION 6.09: Within 30 days of completion of the installation or modification of a stationary source subject to the provisions of Article 6 of this regulation, the owner or operator or applicant shall file a Notice of Completion with the Agency. Each Notice of Completion shall be submitted on a form provided by the Agency, and shall specify the date upon which operation of the stationary source has commenced or will commence.

SECTION 9.03: (a) It shall be unlawful for any person to cause or allow the emission of any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour, which is:
(1) Darker in shade than that designated as No. 1 (20% density) on the Ringelmann Chart, as published by the United States Bureau of Mines; or
(2) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in Section 9.03(a)(1).
(b) The density or opacity of an air contaminant shall be measured at the point of its emission, except when the point of emission cannot be readily observed, it may be measured at an observable point of the plume nearest the point of emission.

(c) This section shall not apply when the presence of uncombined water is the only reason for the failure of the emission to meet the requirements of this section.

SECTION 9.09: General Particulate Matter (PM) Standard. It shall be unlawful for any person to cause or allow the emission of particulate matter in excess of the following concentrations:
Equipment Used in a Manufacturing Process: 0.05 gr/dscf

SECTION 9.11: It shall be unlawful for any person to cause or allow the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

SECTION 9.13: It shall be unlawful for any person to cause or allow the installation or use of any device or use of any means designed to mask the emission of an air contaminant which causes detriment to health, safety or welfare of any person.

SECTION 9.15: It shall be unlawful for any person to cause or allow visible emissions of fugitive dust unless reasonable precautions are employed to minimize the emissions. Reasonable precautions include, but are not limited to, the following:
(1) The use of control equipment, enclosures, and wet (or chemical) suppression techniques, as practical, and curtailment during high winds;
(2) Surfacing roadways and parking areas with asphalt, concrete, or gravel;
(3) Treating temporary, low-traffic areas (e.g., construction sites) with water or chemical stabilizers, reducing vehicle speeds, constructing pavement or rip rap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways; or
(4) Covering or wetting truck loads or allowing adequate freeboard to prevent the escape of dust-bearing materials.

SECTION 9.16(c): General Requirements for Indoor Spray-Coating Operations. It shall be unlawful for any person subject to the provisions of this section to cause or allow spray-coating inside a structure, or spray-coating of any motor vehicles or motor vehicle components, unless all of the following requirements are met:
(1) Spray-coating is conducted inside an enclosed spray area;
(2) The enclosed spray area employs either properly seated paint arresters, or water-wash curtains with a continuous water curtain to control the overspray; and
(3) All emissions from the spray-coating operation are vented to the atmosphere through an unobstructed vertical exhaust vent.

REGULATION I, SECTION 9.20(a): It shall be unlawful for any person to cause or allow the operation of any features, machines or devices constituting parts of or called for by plans, specifications, or other information submitted pursuant to Article 6 of Regulation I unless such features, machines or devices are maintained in good working order.

Washington State Administrative Code

WAC 173-400-040(3): Fallout. No person shall cause or allow the emission of particulate matter from any source to be deposited beyond the property under direct control of the owner or operator of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.

WAC 173-400-040(4): Fugitive emissions. The owner or operator of any emissions unit engaging in materials handling, construction, demolition or other operation which is a source of fugitive emission:

(a) If located in an attainment area and not impacting any nonattainment area, shall take reasonable precautions to prevent the release of air contaminants from the operation.

WAC173-400-111(7): Construction limitations.

(a) Approval to construct or modify a stationary source becomes invalid if construction is not commenced within eighteen months after receipt of the approval, if construction is discontinued for a period of eighteen months or more, or if construction is not completed within a reasonable time. The permitting authority may extend the eighteen-month period upon a satisfactory showing by the permittee that an extension is justified.

Federal

No federal rules apply

K. PUBLIC NOTICE

This project does meet the criteria for mandatory public notice under WAC 173-400-171(3). Criteria requiring public notice includes, but is not limited to, a project that exceeds emission threshold rates as defined in WAC 173-400-030 (e.g. 40 tpy NOx, VOC, or SO_2, 100 tpy CO, 15 tpy PM_{10}, 10 tpy $PM_{2.5}$, 0.6 tpy lead), includes a WAC 173-400-091 synthetic minor limit, has a toxic air pollutant emission increase above the acceptable source impact level in WAC 173-460-150, or has significant public interest. This project includes a notice of construction application or regulatory order used to establish a creditable emission reduction. A notice of application was posted on the Agency's website for 15 days. No requests or responses were received. A copy of the website posting is below:

New Construction Projects

Company	Address	Project Description	Date Posted	Contact Engineer
Woodlawn Abbey Mausoleum	12421 Valley Ave E, Puyallup, WA 98372	Woodlawn Abbey Mausoleum is proposing to install one Facultatieve Technologies Model FT III SE Human Crematory ("the crematory") at their Puyallup facility. The crematory will replace an existing crematory onsite.	6/22/21	Carl Slimp

L. RECOMMENDED APPROVAL CONDITIONS

Standard Conditions:

1. Approval is hereby granted as provided in Article 6 of Regulation I of the Puget Sound Clean Air Agency to the applicant to install or establish the equipment, device or process described hereon at the installation address in accordance with the plans and specifications on file in the Engineering Division of the Puget Sound Clean Air Agency.

2. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.

Specific Conditions:

Throughput Limit:

3. The total mass cremated in the Facultatieve Technologies Model FT III SE Human Crematory unit over any 12-month rolling period must not exceed 1,023 cases.

4. The owner or operator shall be limited to 20 cases per day and 200 lbs/hr averaged on a calendar day.

Emissions Limitations and Standards:

5. The exhaust concentration of total particulate matter (filterable and condensable particulate matter) from Facultatieve Technologies Model FT III SE Human Crematory unit shall not exceed 0.06 grains per dry standard cubic feet (gr/dscf) corrected to 7% oxygen (O_2) as measured by EPA Method 5 as modified by Puget Sound Clean Air Agency Board Resolution 540 dated August 11, 1983.

6. The exhaust concentration of carbon monoxide (CO) from the Facultatieve Technologies Model FT III SE Human Crematory unit shall not exceed 50.0 ppm, on a dry, volumetric basis corrected to 7% O_2 as measured by EPA Methods 1, 3A and 10 from Appendix A of 40 CFR Part 60.

7. The exhaust concentration of nitrogen oxides (NO_x) from the Facultatieve Technologies Model FT III SE Human Crematory unit shall not exceed 140 ppm, on a dry, volumetric basis corrected to 7% O_2 as measured by EPA reference methods 1, 3A and 7E from Appendix A of 40 CFR Part 60.

8. Visible emissions from the Facultatieve Technologies Model FT III SE Human Crematory unit may exceed 5 percent opacity for up to 3 minutes in any one hour. At all other times, visible emissions may not exceed 5 percent opacity. Compliance with this condition is determined using Ecology Method 9A.

Operational Limits:

9. The exhaust stack of the Facultatieve Technologies Model FT III SE Human Crematory unit shall be vertical and unobstructed.

10. This cremation unit must only be utilized for human remains and their corresponding containers. No other material shall be incinerated in the primary chamber. Incinerated containers must not contain chlorinated plastics.
11. The secondary chamber of the Facultatieve Technologies Model FT III SE Human Crematory unit must be heated to a minimum temperature of 1,600 degrees Fahrenheit (°F) prior to igniting the primary chamber, and the operating temperature in the secondary chamber (afterburner) must be maintained at or above 1600 °F for the entirety of each cremation cycle and for at least 0.5 hours after each cremation cycle ends.
12. The Facultatieve Technologies Model FT III SE Human Crematory unit must operate with a monitoring system that measures the temperature in the primary and secondary chambers, in degrees Fahrenheit, for the entirety of each cremation cycle and for at least 0.5 hours after each cremation cycle ends. Temperature data for the secondary chamber must be recorded continuously (or sampled at intervals no greater than 15 seconds and recorded as 1 minute averages) for the entirety of each cremation cycle and for at least 0.5 hours after each cremation cycle ends. The temperature monitoring system must be interlocked with an audible alarm such that if the temperature in the secondary chamber falls below 1,600 degrees Fahrenheit, the alarm will sound at which time immediate corrective action must be taken to correct the problem.
13. The Facultatieve Technologies Model FT III SE Human Crematory unit must operate with a monitoring system that measures opacity in the exhaust stack, as a percentage. The opacity monitoring system must be interlocked with an audible alarm such that if the opacity in the exhaust stack exceeds 5 percent, the alarm will sound at which time immediate corrective action must be taken to correct the problem or cease operation of the crematory until the problem is corrected.
14. All temperature and opacity monitoring system components must be maintained, repaired, and replaced in accordance with the manufacturer's recommendations, instructions, and operating manuals.
15. The owner or operator shall annually test or replace the temperature monitoring system thermocouples or pyrometers. If performed, the test shall consist of either a physical or electronically simulated comparison and shall follow manufacturer specifications. The results of the test readings must be within +/- 16 degrees F. If the results of the test readings exceed +/- 16 degrees of the reference value, the thermocouple must be replaced or adjusted to read within +/- 16 degrees of the reference value.

Compliance Demonstration:

16. Initial compliance with Condition 5 must be demonstrated by testing the Facultatieve Technologies Model FT III SE Human Crematory unit's stack within 180 days of starting-up the cremation unit in accordance with Section 3.07 of Puget Sound Clean Air Agency's Regulation I. Compliance testing must be conducted using EPA Method 5 as modified by Puget Sound Clean Air Agency's Board Resolution 540 dated August 11, 1983. Compliance testing must be conducted during the entire duration of case and must consist of at least three separate test runs, each with a minimum

duration of 1 hour and must consist of at least three separate test runs, each with a minimum duration of 1 hour. One Ecology Method 9A observation of at least one hour duration shall be conducted concurrently with each of the particulate sampling runs to demonstrate initial compliance with Condition 8.

17. Initial compliance with Condition 6 must be demonstrated by testing the Facultatieve Technologies Model FT III SE Human Crematory unit's stack within 180 days of starting-up the cremation unit in accordance with Section 3.07 of Puget Sound Clean Air Agency's Regulation I. Compliance testing must be conducted using EPA Methods 1, 3A, and 10. Compliance testing must be conducted during the entire duration of case and must consist of at least three separate test runs, each with a minimum duration of 1 hour.

18. Initial compliance with Condition 7 must be demonstrated by testing the Facultatieve Technologies Model FT III SE Human Crematory unit's stack within 180 days of starting-up the cremation unit in accordance with Section 3.07 of Puget Sound Clean Air Agency's Regulation I. Compliance testing must be conducted using EPA Methods 1, 3A, and 7E. Compliance testing must be conducted during the entire duration of case and must consist of at least three separate test runs, each with a minimum duration of 1 hour.

19. If requested by the Agency, ongoing compliance with Conditions 5, 6, and 7 must be demonstrated by testing the Facultatieve Technologies Model FT III SE Human Crematory unit in the timeframe requested by the Agency and in accordance with Section 3.07 of Puget Sound Clean Air Agency's Regulation I.

Recordkeeping Requirements:

20. All records required by this Order of Approval must be maintained for at least two years.

21. The following records shall be kept onsite, updated within 30 days at the end of each month for at least two years from the date of generation, and be made readily available to Agency personnel upon request:

    a. Compliance test reports.

    b. Thermocouple or pyrometer calibration test reports, including the date and results of each test, the test method used, and a record of who performed the test. If any gauge is replaced, the owner or operator shall keep a record of the date it was replaced and who replaced it.

    c. All temperature monitoring data.

    d. Total cremated mass in pounds for each month and the resulting 12-month rolling total. The 12-month rolling total is defined as the sum of the current month and the previous eleven (11) months.

    e. Total number of cremations conducted each calendar day.

f. Operating time and weight per case.

g. On a calendar quarter basis, the periods of time when only pathological waste is burned and the weight of pathological waste burned in the unit.

h. A log showing corrective actions taken to maintain the secondary chamber temperature at or above 1,600°F.

i. A log showing corrective actions taken to maintain the opacity in the exhaust stack at or below 5 percent.

Reporting Requirements:

22. For every compliance test required by this Order of Approval, a test notification must be submitted to the Puget Sound Clean Air Agency as required by Regulation I, Section 3.07. Each notification must clearly state whether modifications or alternatives to a required test method are planned.

23. A test plan must be submitted to the Puget Sound Clean Air Agency at least 30 days before conducting a test to demonstrate compliance with Conditions 5, 6, and 7. The test plan must include the following:
    a. Description of all test methods.
    b. Description of modifications or alternatives to a required test method.
    c. Quality assurance and control procedures.
    d. Procedures and intent to monitor temperature and opacity during each test run.
    e. Procedures and intent to calculate total mass cremated during the entire test.

24. This NOC will cancel and supersede NOC 10480 upon installation of the Facultatieve Technologies Model FT Ill SE Human Crematory. The owner or operator may not operate the Facultatieve Technologies Model FT Ill SE Human Crematory unit until the Therm Tec Human Crematory, Model SQC-300, unit has been removed from service.

M. CORRESPONDENCE AND SUPPORTING DOCUMENTS


RE_ Woodlawn Abbey Mausoleum.ms


RE_ Crematory Replacement.msg


Existing Unit vs. FTIII Cremator Criteria and


RE_ Crematory Replacement.msg

N. REVIEWS

Reviews	Name	Date
Engineer:	Carl Slimp	4/25/22
Inspector:	Wellington Troncoso	4/27/22
Second Review:	John Dawson	4/29/22
Applicant Name:	Corey Gaffney	6/1/22