ENGINEERING EVALUATION

A Memorial Services LLC
8860 Muraoka Drive
Gilroy, CA 95020
Application No. 32152
Facility ID No. 17130

Background

A Memorial Services (applicant) has applied for Authorities to Construct and Permits to Operate for the following equipment:

S-5 Natural Gas Fired Animal Crematory Retort – Matthews IEB 32-5S, 4.5 MMbtu/hr natural gas, maximum
S-6 Natural Gas Fired Animal Crematory Retort – Matthews IEB 32, 3.5 MMbtu/hr natural gas, maximum

A Memorial Services is a business providing pet cremation services in Gilroy. They currently have one permitted animal crematory retort. This application is to replace the existing permitted animal crematory retort (S-1) with 2 new crematory retorts that will also be fired on natural gas.

Since the initial application submittal, the applicant has revised the proposed project and has agreed to a throughput limit of 725,166 pounds of bodies per year and 250 pounds per hour at S-5 and 448,980 pounds per year and 250 pounds per hour at S-6. These limits are necessary to comply with health risk limits in Regulation 2-5.

Also, the applicant has proposed to avoid Best Available Control Technology requirements by accepting a voluntary limit on each crematory retort of 56,500 standard cubic feet of natural gas (57.6 MMBtu) usage per day and 2,400 lbs per day of cremations. This is a voluntary limit, which if exceeded would trigger Best Available Control Technology review.

Both crematories could operate for 24 hours a day, 7 days a week. S-5 is a slightly larger unit and has a maximum firing rate of 4.5 MMBtu/hour, and S-6 has a maximum firing rate of 3.5 MMBtu/hour.

The criteria pollutant emissions from S-5 and S-6 are nitrogen oxides (NOx), carbon monoxide (CO), precursor organic compounds (POC), sulfur dioxide (SO_2) and particulate matter (PM_{10} and $PM_{2.5}$). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

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Emissions

Table 1a. Criteria Pollutant Emissions per Source at S-5 and S-6 from Combustion of Fuel

Pollutant	Emission Factor ($lb/MMft^3$)	Maximum Daily Emissions (lb/day)	Annual Emissions (tons/yr)
PM10	7.6	0.43	0.08
PM2.5	7.6	0.43	0.08
NOx	100	5.65	1.03
CO	84	4.74	0.87
SO2	0.6	0.03	0.01
POC	5.5	0.31	0.06

Notes:
-Daily emissions based on a fuel consumption limit of 56,500 cubic feet per day.
-Annual emissions based on permitted usage of 365 days per year.
-Emissions factors based on EPA's AP-42 Compilation of Emission Factors from Stationary Sources, Chapter 1.4 (Tables 1.4-1 and 1.4-2), dated July 1998.
-Assumes all PM10 can also be emitted as PM2.5.

Table 1b. Maximum Criteria Pollutant Emissions at S-5 From Cremation

Pollutant	Emission Factor (lb/ton)	Maximum Daily Emissions (lb/day)	Annual Emissions (tons/yr)
PM10	0.09	1.36	0.21
PM2.5	0.09	1.36	0.21
NOx	0.27	4.27	0.65
CO	0.22	3.54	0.53
SO2	0.16	2.61	0.39
POC	0.02	0.36	0.05

Notes:
-Daily emissions based on maximum cremations of 2,400 pounds of bodies per day.
-Annual emissions based on an annual throughput limit of 725,166 pounds of bodies per year.
-Emissions factors based on EPA's AP-42, 42 Compilation of Emission Factors from Stationary Sources, Chapter 2.3 (Table 2.3-1), dated July 1993.

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Table 1c. Maximum Criteria Pollutant Emissions at S-6
From Cremation

Pollutant	Emission Factor (lb/ton)	Maximum Daily Emissions (lb/day)	Annual Emissions (tons/yr)
PM10	0.09	1.36	0.13
PM2.5	0.09	1.36	0.13
NOx	0.27	4.27	0.40
CO	0.22	3.54	0.33
SO2	0.16	2.61	0.24
POC	0.02	0.36	0.03

Notes:
-Daily emissions based on maximum cremations of 2,400 pounds of bodies per day.
-Annual emissions based on an annual throughput limit of 448,980 pounds of bodies per year.
-Emissions factors based on EPA's AP-42, Compilation of Emission Factors from Stationary Sources, Chapter 2.3 (Table 2.3-1), dated July 1993

Table 1d. Total Daily Project Criteria Pollutant Emissions

Source	PM10 lbs/day	PM2.5 lbs/day	NOx lbs/day	CO lbs/day	SO2 lbs/day	POC lbs/day
S-5	1.79	1.79	9.92	8.28	2.64	0.67
S-6	1.79	1.79	9.92	8.28	2.64	0.67
Combined	3.58	3.58	19.84	16.56	5.28	1.34

Cumulative Increase

The District tracks cumulative emission increases from new and modified source permits issued to facilities. As a part of this project, A Memorial Services will be shutting down their existing crematory retort S-1. The cumulative increase for this project was calculated by subtracting contemporaneous emissions reduction credits from the shutdown of S-1 to the new potential emissions from S-5 and S-6. Contemporaneous emissions reductions are based on the annual average usage of S-1 over the past 3 years. S-1 had an average usage of 13.5 MMBTU of natural gas per day and 45,483 pounds of material cremated per year. Table 2 below shows the existing cumulative increase for the facility, net project emissions, and post-project cumulative increase.

Table 2. Plant 17130 Cumulative Increase

Source	PM10 tons/yr	PM2.5 tons/yr	NOx tons/yr	CO tons/yr	SO2 tons/yr	POC tons/yr
Existing Cumulative Increase	0.14	0.14	1.6	1.34	0.07	0.09
S-1 Reduction	-0.03	-0.03	-0.28	-0.23	-0.02	-0.01
S-5 Potential Emissions	0.29	0.29	1.68	1.40	0.40	0.11
S-6 Potential Emissions	0.21	0.21	1.43	1.20	0.25	0.09
Net Project Emissions	**0.47**	**0.47**	**2.83**	**2.37**	**0.63**	**0.19**
Post-Project Cumulative Increase	**0.61**	**0.61**	**4.43**	**3.71**	**0.70**	**0.28**

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Statement of Compliance

Regulation 1, "General Provisions and Definitions"
The facility is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. A high minimum firing temperature of 1,650 degrees Fahrenheit is being required by permit condition; this is expected to ensure complete combustion. Compliance with this permit condition is expected to prevent public nuisance. However, if any complaints are received due to the implementation of this project, the facility inspector will investigate and issue a violation notice if warranted. Any public nuisance violation would require the operator to submit a new permit application to further abate emissions.

Regulation 2, Rule 1, California Environmental Quality Act (CEQA)
District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with CEQA requirements except for ministerial projects that follow the BAAQMD Permit Handbook or projects exempt from CEQA under Section 2-1-312. Although this project required an HRA and therefore does not qualify as a ministerial permit action, the analysis of this project complies with the review standards in the BAAQMD Permit Handbook. This project qualifies for a categorical exemption under Section 2-1-312 for being a negligible expansion of use. The emissions shown in Table 2 are well below the Thresholds of Significance shown in Table 3-1 in Chapter 3 of the BAAQMD's 2022 CEQA Guidelines. Since this project will emit less than these thresholds of significance, the project is categorically exempt and a CEQA review is not required.

Regulation 2, Rule 1, Public Notification (Regulation 2-1-412)
The public notification requirements of Regulation 2-1-412 apply to modifications which result in an increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school or an overburdened community. The Applicant has reported there is no K-12 school within that radius of this facility, and the Air District's database confirms that there is no K-12 school within one mile from the facility. The website www.greatschools.org also confirms there is no K-12 school within one mile from the facility. However, since this project is within an overburdened community as defined by Regulation 2-1-243, a public notice is required. The public notice fee has been paid, and the public notice will be distributed to all residents and facilities within 1,000 feet of the sources. The District will respond to all public comments received prior to taking final action on this application.

Regulation 2, Rule 2, Section 301, Best Available Control Technology (BACT)
In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10.0 pounds or more per highest day of POC, NPOC, NOx, CO, SO_2, PM_{10} or $PM_{2.5}$. The applicant has accepted voluntary permit conditions that limit the maximum daily usage of each source, which limit maximum daily emissions from S-5 and S-6 to less than 10.0 pounds per day for each pollutant per source, as shown in Table 1d. The permit conditions limit daily natural gas usage to 56,500 standard cubic feet of natural gas and 2,400 pounds of material cremated per source, and additional record keeping will be required to show compliance with these BACT avoidance limits. Based on these limits, BACT is not triggered for S-5 and S-6.

Regulation 2, Rule 2, Section 303, Offsets
Per Regulation 2, Rule 2, Section 302, emission offsets must be provided for any new or modified source at a facility that will have the potential to emit more than 10 tons per year of NOx or POC. Per Regulation 2, Rule 2, Section 303, emission offsets must be provided for any new or modified

source at a facility that will have the potential to emit more than 100 tons per year or more of PM2.5, PM10, or sulfur dioxide. For the post-project facility PTE, the required shutdown of S-1 will remove all potential for emissions from that source. Therefore, the post-project potential emissions are exclusively from S-5 and S-6. Additionally, the potential emissions from S-5 and S-6 summarized below have been based on maximum equipment capacities: maximum throughputs of 4.5 MMBTU/hr and 250 pounds per hour at S-5 and 3.5MMBTU/hr and 250 pounds per hour at S-6. Since the criteria emissions from this application do not cause the facility to exceed any of the triggers, offsets are not required for this application.

Table 3. Facility 4173 Potential to Emit (tons per year)

Pollutant	Existing Emissions	Application Emissions	Post-Project Facility Emissions	Offset Requirement	Offsets Required
NOx	1.60	7.33	7.33	>10	N
POC	0.09	0.52	0.52	>10	N
CO	1.34	6.11	6.11	-	N
PM_{10}	0.14	1.50	1.50	≥100	N
$PM_{2.5}$	0.14	1.50	1.50	≥100	N
SO_2	0.07	2.40	2.40	≥100	N

Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants

The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants (TAC). All TAC emissions from new and modified sources as defined in Section 2-5-214 are subject to risk assessment, if the emissions of any individual TAC exceed either the acute or chronic emission thresholds defined in Table 2-5-1.

The toxic emissions calculations are based on the emission factors from the District Permit Handbook, which are taken from the most current version of the WebFIRE database. A health risk assessment (HRA) was required because the calculated emissions of arsenic, cadmium, hexavalent chromium, cobalt, hydrogen chloride, lead, nickel, and chlorinated dibenzodioxins and furans exceeded either the chronic or acute trigger levels in Regulation 2-5.

The initial HRA had been run based on a combined annual throughput limit of 2,292,000 pounds of material processing, a maximum hourly throughput of 250 pounds per hour at each retort and a stack height of 26 feet. The HRA assumed that a maximum of 75% of the total annual throughput limit could be processed at either S-5 or S-6, and so the HRA was run with two scenarios: the first being the maximum usage of S-5 and the remainder being processed at S-6 (75% at S-5 and 25% at S-6), the second being the maximum usage of S-6 (25% at S-5 and 75% at S-6). The resulting acute hazard index was within acceptable limits, but the cancer risk and chronic hazard index were not. As a result, the applicant revised their proposal to include a stack height of 33 feet for both cremators to determine if the stack height would allow the project to meet Regulation 2-5 health risk limits. The resulting cancer risk and chronic hazard index from the revised HRA were 10.4 in a million and 1.3, respectively, which still did not comply with Regulation 2-5.

The third and final HRA was performed using a stack height of 33 feet above ground level for each retort, a maximum hourly throughput of 250 pounds per hour at each retort, and a maximum combined annual throughput of 1,174,146 pounds of material per year (725,166 pounds at S-5

and 448,980 pounds at S-6). The HRA showed an incremental cancer risk increase of 5.9 in a million, a chronic hazard index of 0.56, and an acute hazard index of 0.048. Additionally, the District expects that the operation of either S-5 or S-6 in conjunction with the operation of S-1 would not result in an exceedance of the HRA limits. This is based on the hourly and annual throughputs of S-1 (130 pounds per hour and 110,000 pounds per year) being significantly lower than the throughputs of either S-5 or S-6. Therefore, the operation of S-1 before both S-5 and S-6 have been started up would not be a violation of Regulation 2-5.

In accordance with the District's Regulation 2-5-301, sources must meet BACT for Toxics (TBACT) if the estimated source health risk exceeds a cancer risk of 1.0 in a million and/or a chronic HI of 0.20. For crematories, TBACT is a secondary combustion chamber to ensure complete combustion, as well as a minimum combustion temperature of 1,650 degrees Fahrenheit. Both S-5 and S-6 trigger TBACT and are equipped with secondary chambers. Permit conditions will be included to require compliance with the minimum combustion temperature. These sources are expected to comply with these TBACT requirements.

Since the estimated project cancer risk from the revised project does not exceed 6.0 in a million, and project chronic HI does not exceed 1.0, the revised project subject to the limitations in the third HRA complies with the District's Regulation 2-5-302 project risk requirements for projects located in an Overburdened Community as defined in Regulation 2-1-243.

Table 4. Toxic Air Contaminants

Pollutant	Emission Factor	Maximum Hourly Emissions	Acute Trigger	Annual Emissions	Chronic Trigger	Risk Screen
	(lb/body)	(lb/hr)	(lb/hr)	(lb/yr)	(lb/yr)	(yes/no)
Acetaldehyde	1.30E-04	4.33E-04	2.10E-01	1.02E+00	2.90E+00	no
Arsenic	1.50E-05	5.00E-05	8.80E-05	1.17E-01	1.60E-03	yes
Beryllium	1.37E-06		None	1.07E-02	3.40E-02	no
Cadmium	1.11E-05		None	8.69E-02	1.90E-02	yes
Chromium, hx	1.35E-05		None	1.06E-01	5.10E-04	yes
Cobalt	8.75E-07		None	6.85E-03	1.10E-02	yes
Copper	2.74E-05	9.13E-05	4.40E-02		None	no
Formaldehyde	8.14E-06	2.71E-05	2.40E-02	6.37E-02	1.40E+01	no
Hydrogen chloride	7.20E-02	2.40E-01	9.30E-01	5.64E+02	3.50E+02	yes
Hydrogen fluoride	6.55E-04	2.18E-03	1.10E-01	5.13E+00	5.70E+01	no
Lead	6.62E-05		None	5.18E-01	2.90E-01	yes
Naphthalene	8.34E-06		None	6.53E-02	2.40E+00	no
Nickel	3.82E-05	1.27E-04	8.80E-05	2.99E-01	3.10E-01	yes
Selenium	4.36E-05		None	3.41E-01	8.00E+00	no
Vanadium	5.79E-05	1.93E-04	1.30E-02		None	no
Chlorinated dibenzodioxins and furans	1.10E-09		None	8.61E-06	4.40E-08	yes
PAH (benzo(a)pyrene equivalents)	2.40E-08		None	1.88E-04	3.30E-03	no

Note: Except for mercury, formaldehyde and acetaldehyde, pollutant emission factors are from EPA's FIRE database (https://cfpub.epa.gov/webfire/) for crematoriums (SCC = 31502101). Maximum per hour is based on a combined hourly throughput of 500 lbs/hr (250lbs/hr for each retort). Maximum per year is based on total combined throughput of 1,174,146 lbs/yr.

Regulation 6, Rule 1: Particulate Matter – General Requirements

This operation and this facility are expected to comply with Regulation 6-1-301 Ringelmann No. 1 Limitation, 6-1-302 Opacity Limitation, 6-1-303 Ringelmann No. 2 Limitation, 6-1-305 Visible Particles, and 6-1-310 Total Suspended Particulate Concentration Limits. The operation of S-5 and S-6 within the proposed permit conditions is not expected to violate the above regulations since the permit conditions are intended to ensure complete combustion.

The Air District's Compliance and Enforcement staff will verify compliance with Regulation 6-1 standards during their routine inspections.

Permit Conditions

Condition Number 100710 for:

S-5 Natural Gas Fired Animal Crematory Retort – Matthews IEB 32-5S, 4.5 MMbtu/hr natural gas, maximum
S-6 Natural Gas Fired Animal Crematory Retort – Matthews IEB 32, 3.5 MMbtu/hr natural gas, maximum

1. The owner/operator shall not exceed an annual firing rate of 39,420 MMBTU of natural gas at S-5 and 30,660 MMBTU of natural gas at S-6 in any consecutive twelve-month period. (basis: Cumulative Increase)

2. The owner/operator shall not cremate more than 725,166 pounds of animal remains at S-5 and shall not cremate more than 448,980 pounds of animal remains at S-6 in any consecutive twelve-month period. Additionally, to comply with the health risk limits in Regulation 2, Rule 5, the owner/operator shall limit cremations at each cremator S-5 and S-6 to no more than 250 pounds per hour of animal remains. (basis: Cumulative Increase; Regulation 2-5)

3. The owner/operator shall ensure no more than 56,500 cubic feet of natural gas and 2,400 pounds of animal remains are combusted in any calendar day at each cremator S-5 and S-6 to avoid triggering Best Available Control Technology for NOx emissions. If either of these limits are exceeded, the owner/operator shall submit a permit application within 30 days of the exceedance, requesting modification of the source permits, including evaluation of BACT control requirements. (Basis: BACT avoidance)

4. To show compliance with parts 1, 2, and 3, the owner/operator shall maintain a District approved log of daily natural gas usage and daily material throughput at S-5 and S-6. Each month, the owner/operator shall calculate and summarize the total monthly and most recent 12-month natural gas usage and material throughput. These records shall be

made available to District staff upon request and shall be maintained onsite for at least 3 years.

5. The owner/operator shall maintain the operating temperature in the secondary chamber of the S-5 and S-6 Cremators at or above 1650 degrees Fahrenheit during the cremation mode. Any temperature excursion below 1600 degrees Fahrenheit during the cremation mode will be considered a violation of this permit condition. The owner/operator shall equip each cremator with a District approved continuous temperature monitoring and recording device to ensure compliance with this condition. The location of the thermocouple for each source shall be approved by the Source Test Section of the District. Natural gas input to the secondary chamber burner shall be increased, if necessary, to increase temperature sufficiently to control odor and visible plumes. Additionally, the stack height of each cremator shall be at least 33 feet above ground level (Basis: Regulation 6-1-301, 6-1-310; TBACT, Regulation 2-5)

6. For each cremator S-5 and S-6: The owner/operator shall not cremate until the Cremator has been preheated so that the temperature in the secondary chamber is at least 1650 degrees Fahrenheit. (Basis: Regulation 6-1-301, 6-1-310; TBACT)

7. The owner/operator shall fire the S-5 and S-6 Cremators with natural gas only. (basis: Cumulative Increase; TBACT)

8. The owner/operator shall use the S-5 and S-6 Cremators to cremate animal remains with or without enclosure in associated containers. No other material contaminated with toxic air contaminants as listed by Air Resources Board, including radioactive and biohazardous waste, shall be incinerated in these cremators without prior approval of the District. (basis: Cumulative Increase; Regulation 2-5)

9. The District may require the owner/operator of the cremators to conduct a District approved source test to determine particulate matter, hydrocarbon, NOx, CO, O2, HCl, and toxic emissions under unusual conditions, such as obese case, disaster bags. The Source Test Section of the District shall be contacted to obtain approval for the source test method. The Source Test Section shall be notified at least 7 days in advance of any expected source test. A copy of the source test report for each test shall be provided to the District within 30 days of source test date. (basis: Cumulative Increase; Regulation 2-5)

10. The owner/operator shall have the S-5 and S-6 Cremators equipped with sampling ports and platforms, the location of which shall have the approval of the Source Test Section of the District. (Basis: Regulation 6-1-310)

11. The owner/operator shall have an operator present at all times during cremations. (Basis: Regulation 6-1-301)

12. The owner/operator shall maintain the S-5 and S-6 Cremators in good working condition. The date and detailed description of the type of maintenance performed on the cremators shall be recorded in a District approved logbook and retained for at least two years. (basis: Regulation 6-1-301, 6-1-310)

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13. The owner/operator shall notify the District within 72 hours of starting up either S-5 and/or S-6. Additionally, the owner/operator may not operate both S-5 and S-6 until S-1 has been completely shut down. The owner/operator shall notify the District within 72 hours of shutting down S-1, and the District may require an inspection for confirmation (basis: Cumulative Increase)

14. The owner/operator may continue to operate S-1 until both S-5 and S-6 have been started up. If only one of S-5 and S-6 has been started up, S-1 may continue to operate as permitted under Permit Condition #22472: maximum processing rates of 130 pounds per hour, 1950 pounds per day, 110,000 pounds per year, and a maximum firing rate of 2 MMBTU per hour (basis: Cumulative Increase)

Existing Condition # 22472 for S-1 will be removed when S-1 is removed from service.

End of Conditions

Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed sources will be located within an Overburdened Community as defined in District Regulation 2-1-243 and an HRA was performed as required in District Regulation 2-5, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on the issuance of Authorities to Construct for the following sources:

S-5 Natural Gas Fired Animal Crematory Retort – Matthews IEB 32-5S, 4.5 MMbtu/hr natural gas, maximum

S-6 Natural Gas Fired Animal Crematory Retort – Matthews IEB 32, 3.5 MMbtu/hr natural gas, maximum

Lucas Griswold

Signature

7/7/2025
Date

Prepared by: Lucas Griswold, Air Quality Engineer

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