MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT

SUPPLEMENT B to
DOCKET #09-20

COMPANY: Vaughn Greene Funeral Services, PA

LOCATION: 4905 York Road, Baltimore, MD 21212

APPLICATION: Installation of a Matthews Environmental Solutions Power-Pak II Plus human crematory.

ITEM	DESCRIPTION
1	Company Presentation of Proposed Installation

Vaughn Greene Funeral Home – New Crematorium

VIRTUAL INFORMATIONAL MEETING 11/2

IN-PERSON INFORMATIONAL MEETING 11/9

The Applicant

VaughnGreene
Funeral Services, P.A.

- Family-owned and operated
- 26 years in business
- 4 Baltimore-area locations

Application

Air Quality Permit

- For new equipment

New cremation facilities

- At existing funeral chapel

COMMUNITY NEED

Cremation has surpassed burial as the most popular end-of-life option in the US.

- National Funeral Directors Association

Project Team

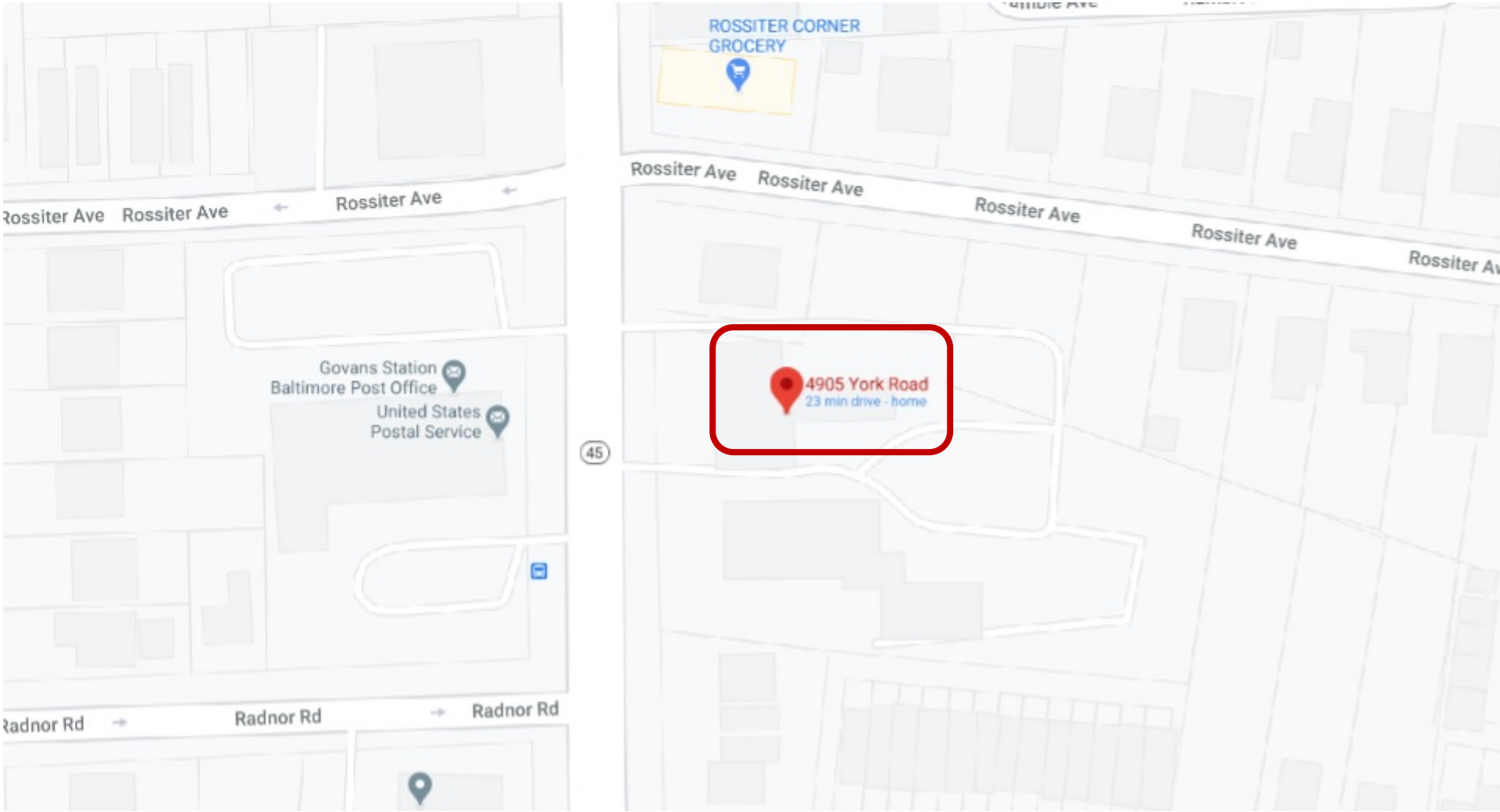
Vaughn Greene Funeral Services
William Miller
Managing Member

Matthews Environmental Solutions
Michael Tricoche – Engineer
Jeffrey Barron

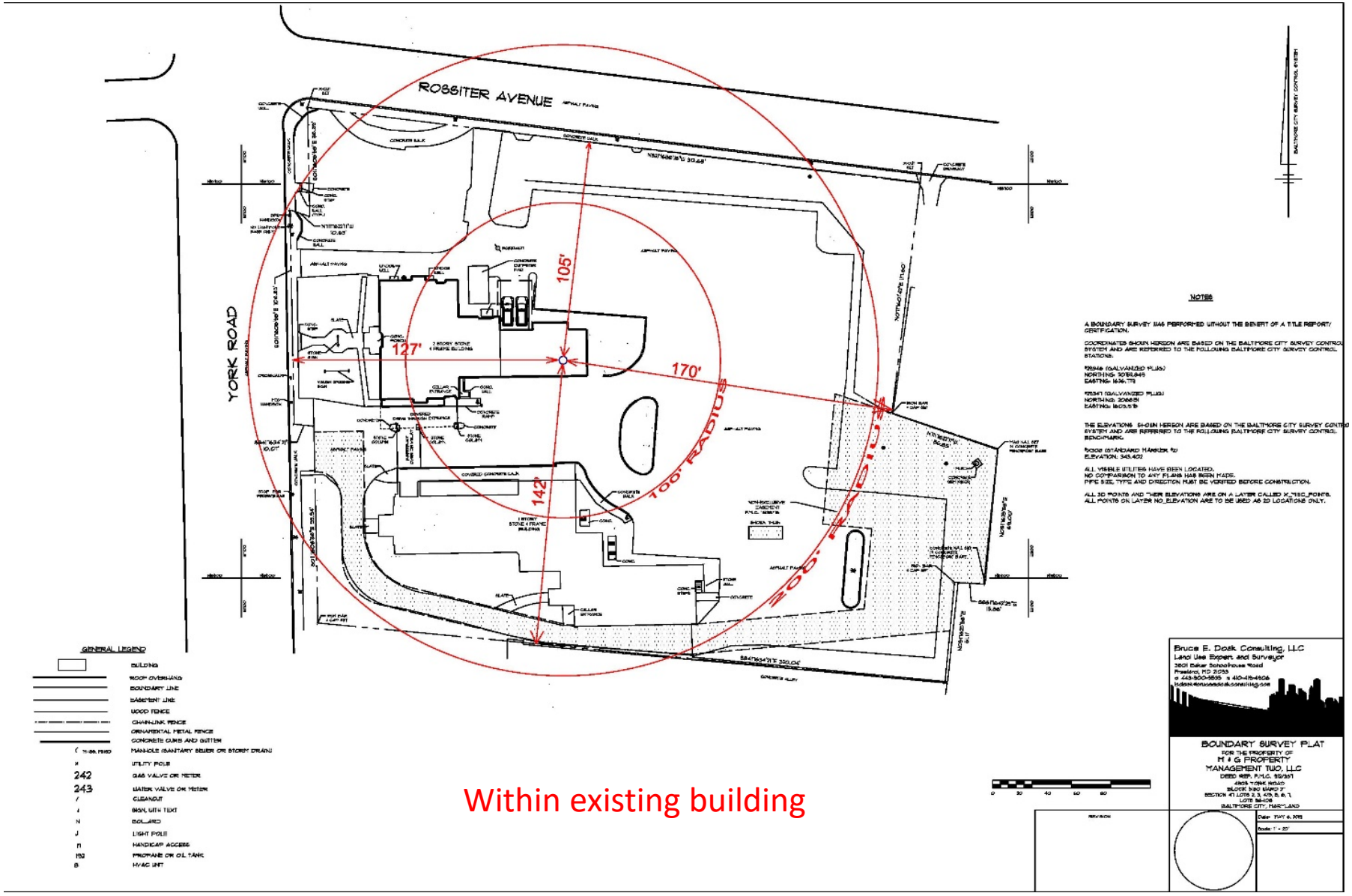
Castles & Cottages
William "Doug" Beims – Architect

Century Engineering
Bob Bathurst, PE – Principal

Site – 4905 York Road

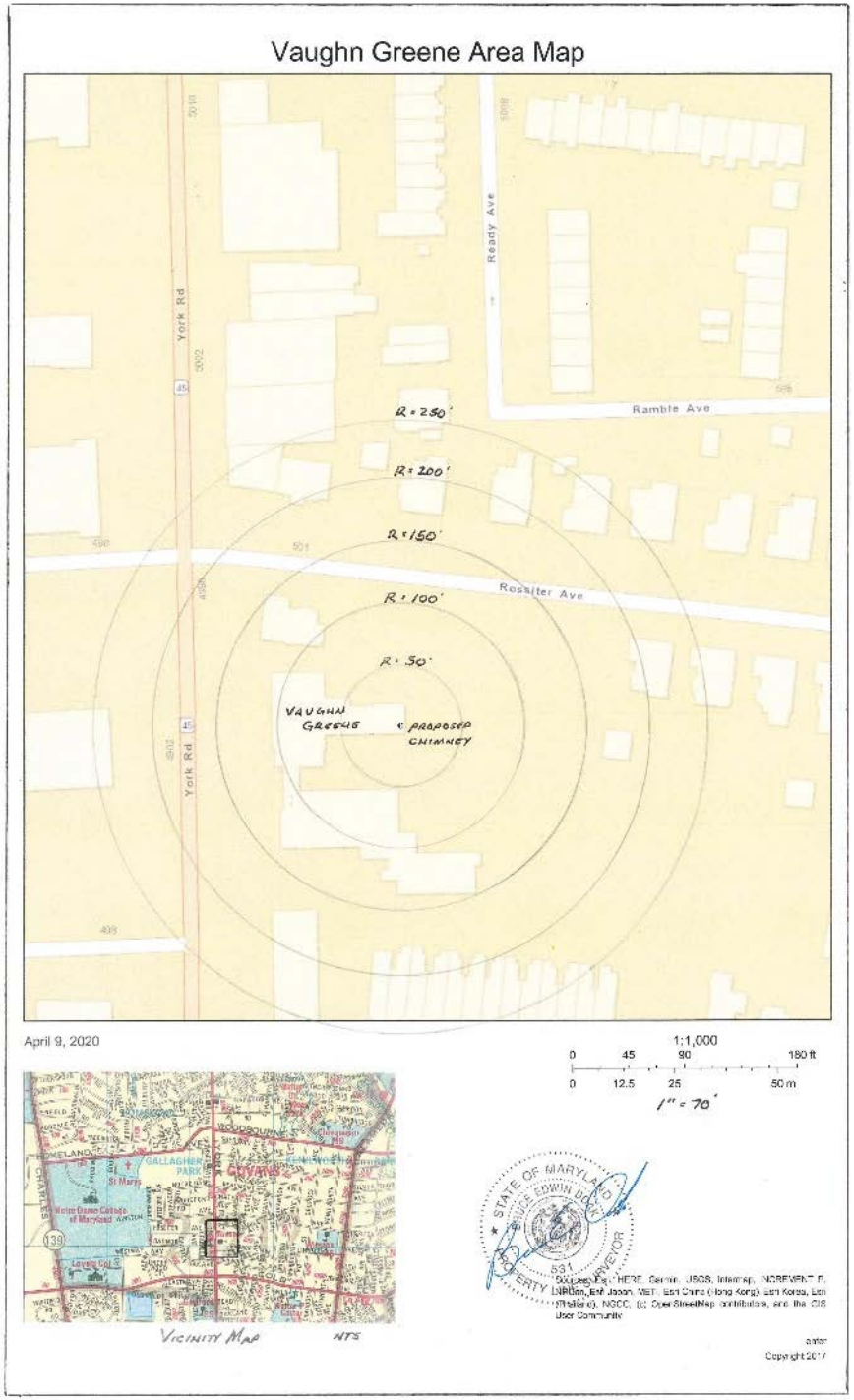


Installation Location



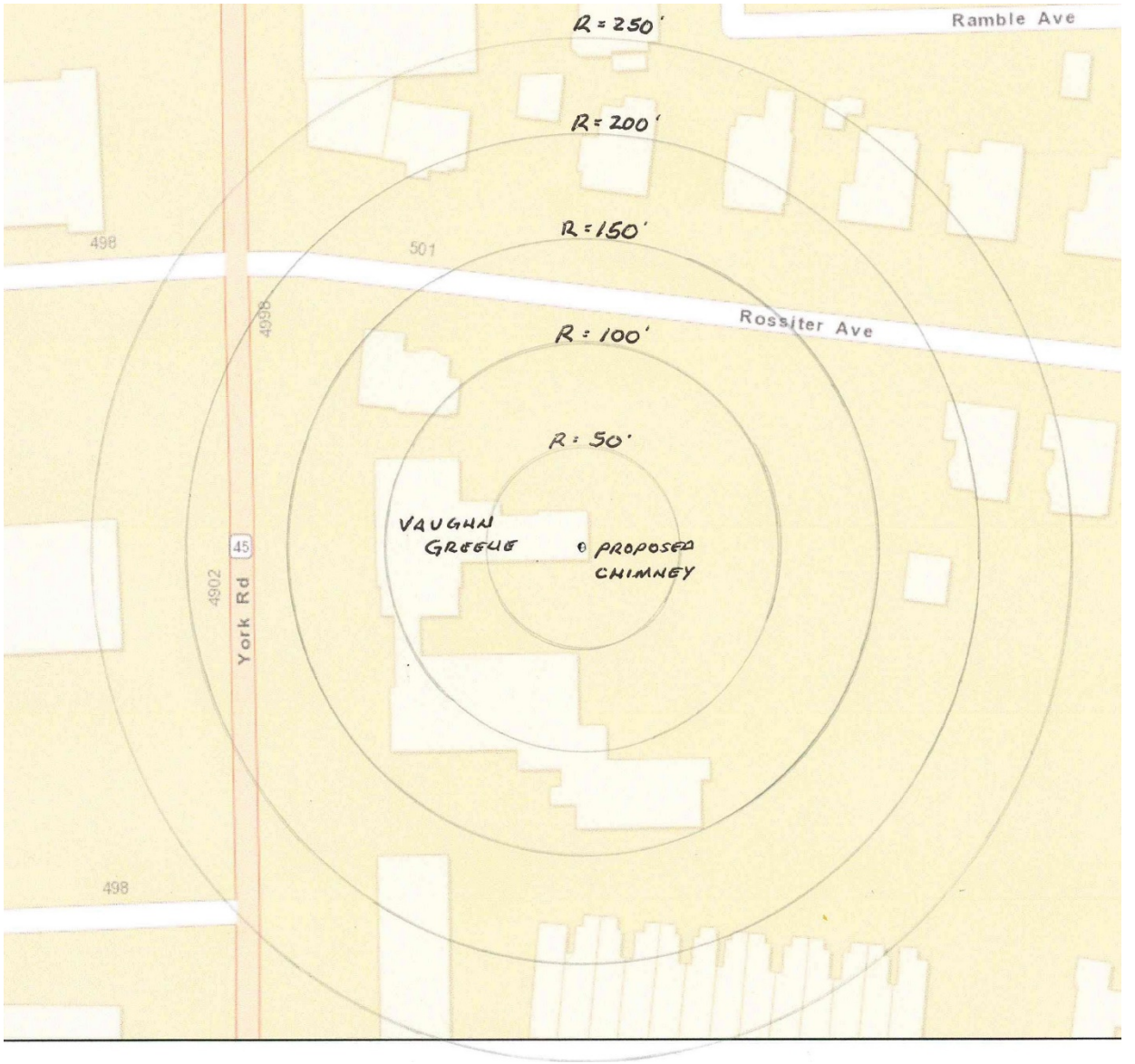
Within existing building

Surveyed Area Map



Surveyed Area Map

Zoomed In



No residences within 150’ radius

North – Vacant lot, tree line & Rossiter Avenue

East – Parking lot and thick tree line

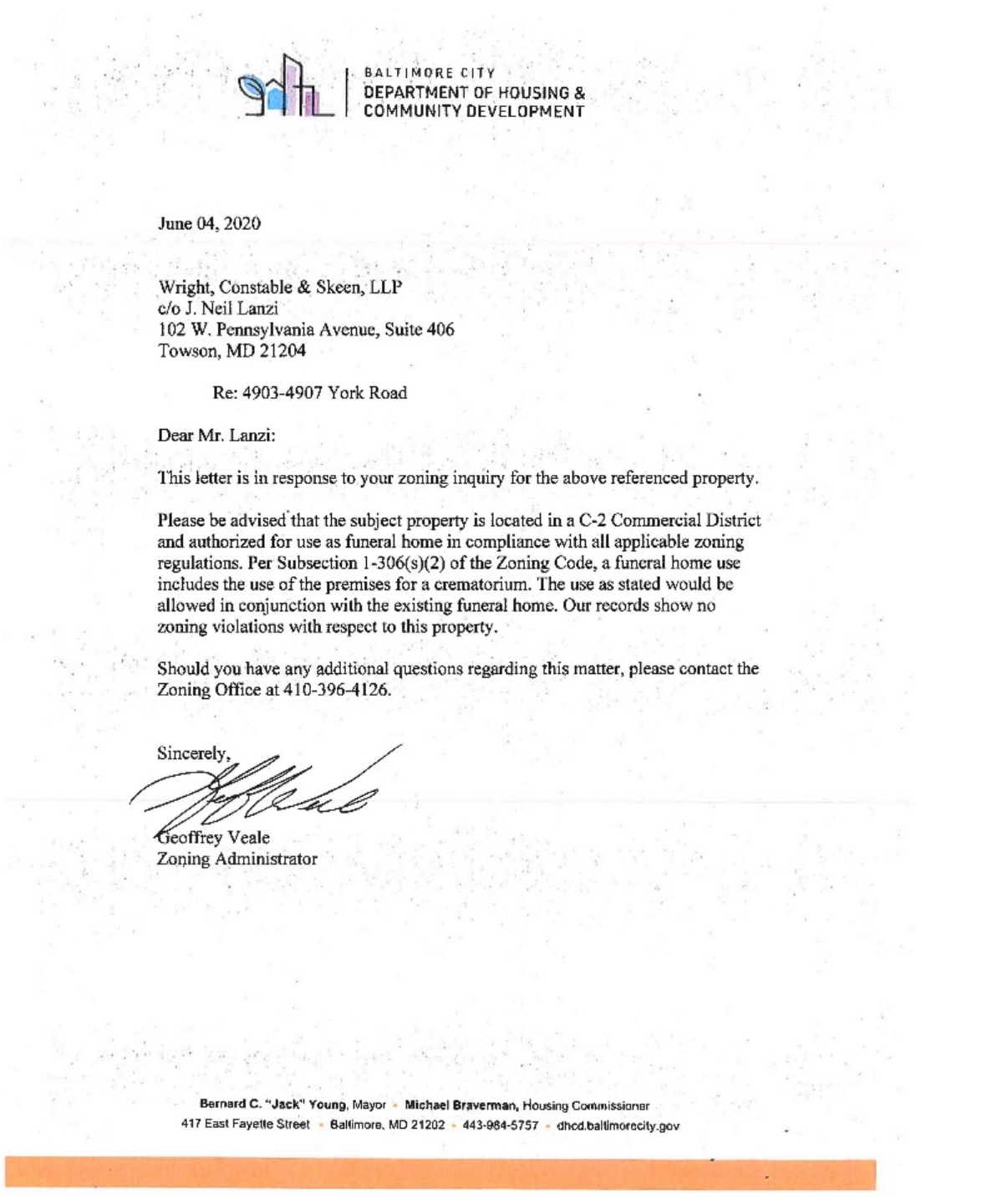
West – York Road and commercial (including post office)

South – Wing of funeral home and parking lot

Satellite View

Zoning

- C-2 Commercial
- Approved for funeral homes and crematoria



BALTIMORE CITY
DEPARTMENT OF HOUSING & COMMUNITY DEVELOPMENT

June 04, 2020

Wright, Constable & Skeen, LLP
c/o J. Neil Lanzi
102 W. Pennsylvania Avenue, Suite 406
Towson, MD 21204

Re: 4903-4907 York Road

Dear Mr. Lanzi:

This letter is in response to your zoning inquiry for the above referenced property.

Please be advised that the subject property is located in a C-2 Commercial District and authorized for use as funeral home in compliance with all applicable zoning regulations. Per Subsection 1-306(s)(2) of the Zoning Code, a funeral home use includes the use of the premises for a crematorium. The use as stated would be allowed in conjunction with the existing funeral home. Our records show no zoning violations with respect to this property.

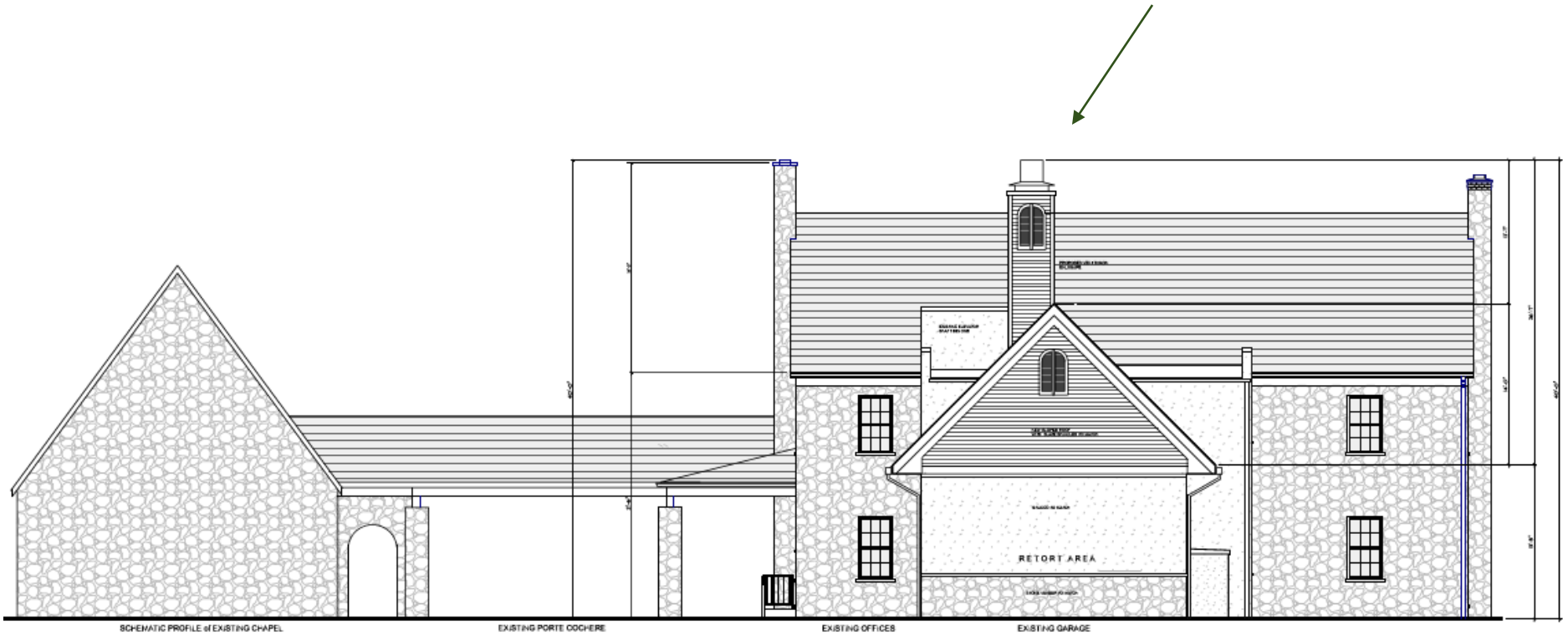
Should you have any additional questions regarding this matter, please contact the Zoning Office at 410-396-4126.

Sincerely,

Geoffrey Veale
Zoning Administrator

Bernard C. "Jack" Young, Mayor • Michael Braverman, Housing Commissioner
417 East Fayette Street • Baltimore, MD 21202 • 443-984-5757 • dhcd.baltimorecity.gov

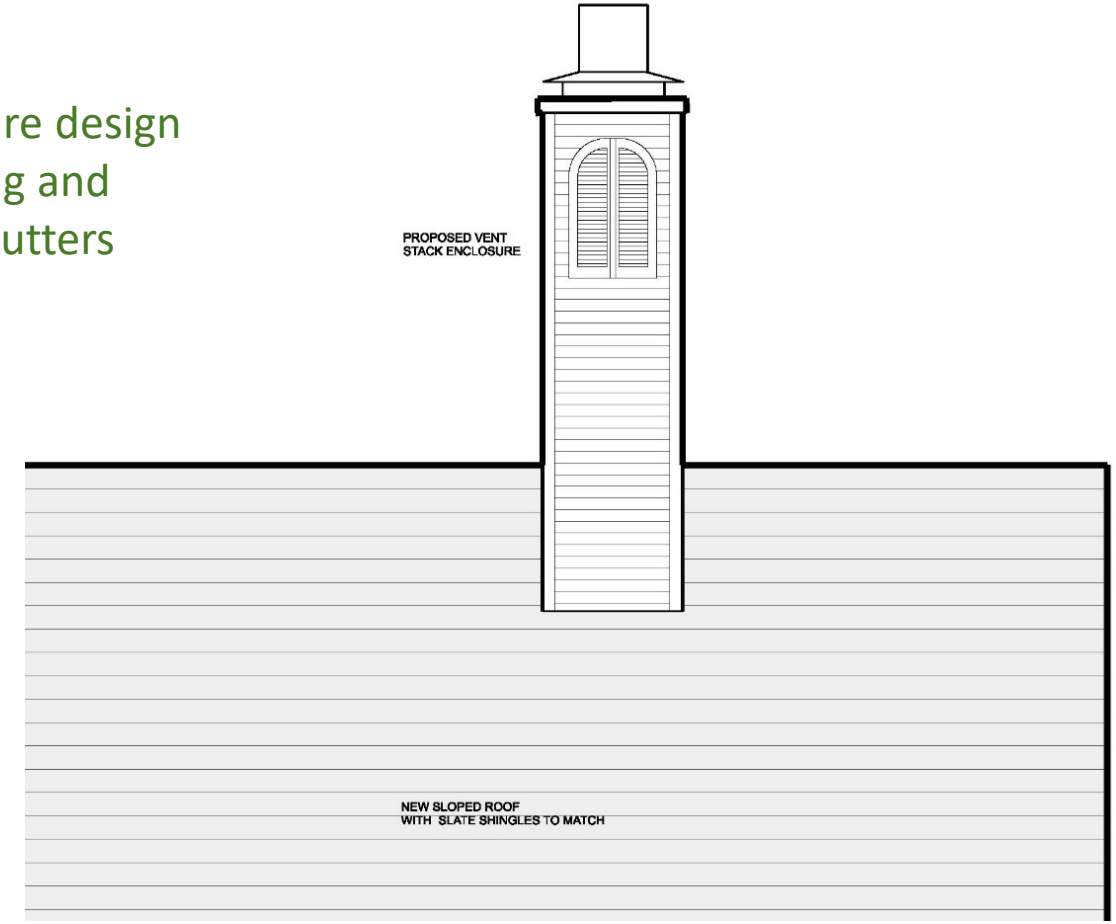
Rendering – Rear Elevation



Rendering – Side Elevation

Rendering – Detail of Stack Enclosure

Stack enclosure design includes siding and decorative shutters



Stack Enclosure Details

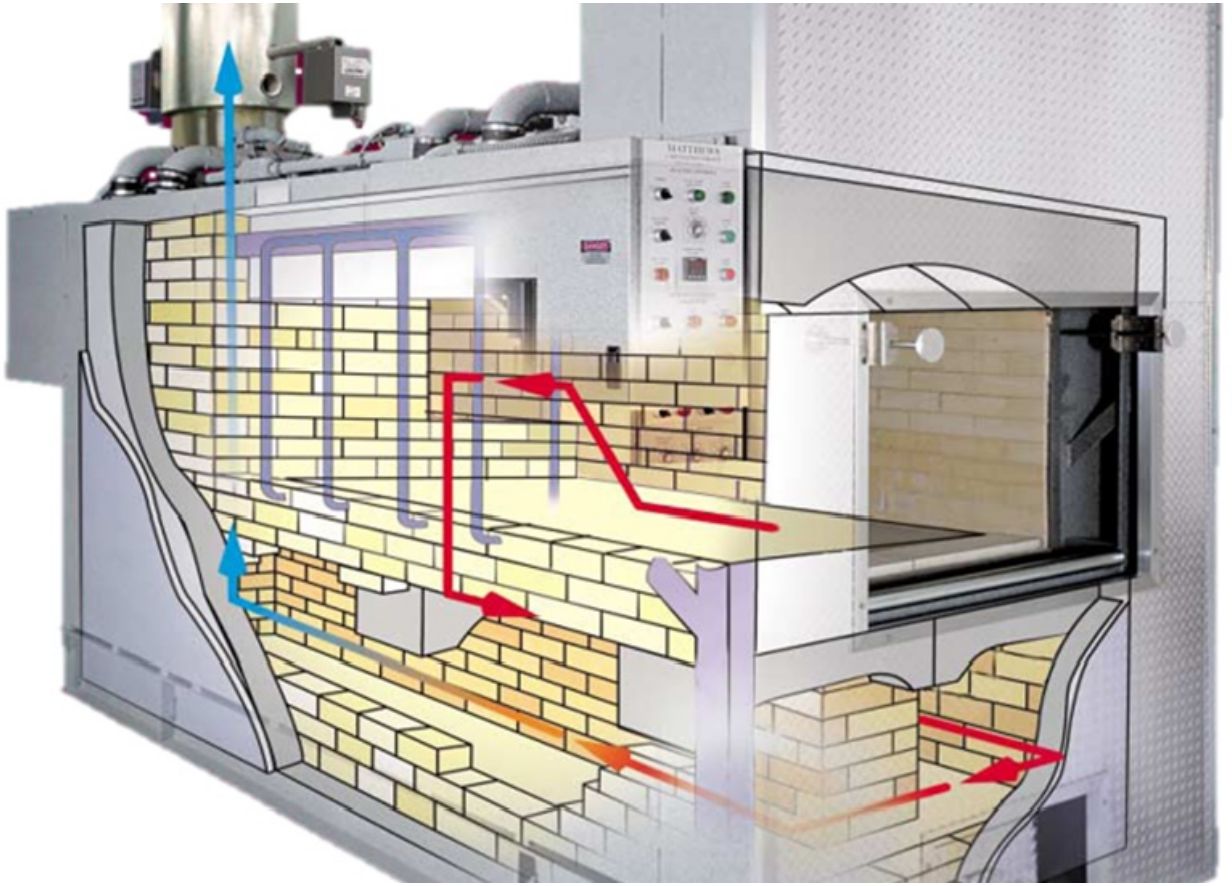
- 40’ from the ground
- Same height as the two existing chimneys on original building (1947)
  - No increase in overall height
- Roof line and enclosure designed to blend with existing materials and architecture
- Rises 12’7” above retort area pitched roof peak

Rendering – 3 Dimensional Front

Rendering – 3 Dimensional Side/Rear

Equipment

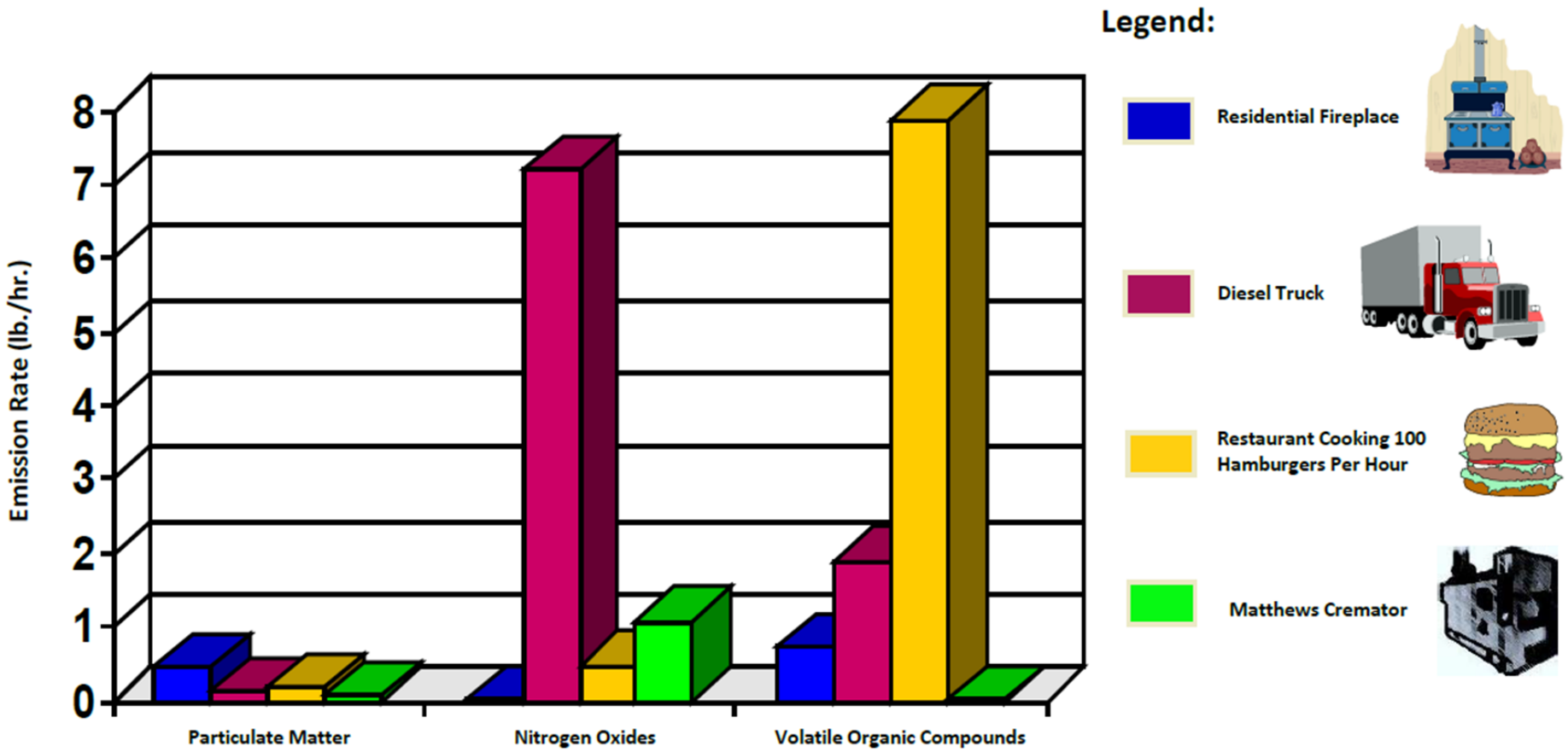
Matthews Environmental Solutions Power-Pak II Plus



Equipment Features

- Emission Monitoring System
  - Automatic monitoring and correction of visible smoke
- M-pyre® 2.0 Operating Controls
  - Live operating graphics
- Smoke-Buster™ System
  - Complete combustion of smoke and odor
- Acoustic Cabinet
  - Noise isolation technology and improved insulation
- Stainless Steel Stack
  - Non-corrosive, with 4.5” refractory lining for durability, strength, and safety

Emissions


Emission Rate (lb./hr.)
0
1
2
3
4
5
6
7
8
Particulate Matter
Nitrogen Oxides
Volatile Organic Compounds
Legend:
Residential Fireplace
Diesel Truck
Restaurant Cooking 100 Hamburgers Per Hour
Matthews Cremator

Emissions Calculations

Assumes maximum operation of 12 hours per day, 6 days per week

Likely to be much less in actual use

Calculation Of Emissions

Estimated Emission Calculation

Matthews Environmental Solutions
(previously Matthews Cremation Division)
Crematory Incinerator Model IE43-PPII Plus

Total Incenerator Burn Capacity 175 lb/hr of remains (type 4) and associated containers (type 0)
Flue gas flow rate = 1175 dscfm 12 Hours/Day X 6 Days/Week X 52 Weeks/Year
(100 % Excess Air) = 3744 Hours/Year

Total Emission Rate = Incinerator Burn Rate X Emission Factor

Sulfer Dioxide (SO_2)

$$\frac{175 \text{ lb/hr} \times 2.17 \text{ lb/ton} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}}{} = 0.190 \text{ lb/hr} = 0.355446 \text{ TPY}$$

$$\frac{0.189875 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 2.61 \text{ mg/m}^3} = 16.55 \text{ ppmv}$$

Nitrogen Oxide (NOx - as Nitrogen Dioxide)

$$\frac{175 \text{ lb/hr} \times 3.56 \text{ lb/ton} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}}{} = 0.3115 \text{ lb/hr} = 0.583128 \text{ TPY}$$

$$\frac{0.3115 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.028 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3} = 38.11 \text{ ppmv}$$

Particulates (PM & PM_{10})

$$\frac{175 \text{ lb/hr} \times 4.67 \text{ lb/ton} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}}{} = 0.408625 \text{ lb/hr} = 0.764946 \text{ TPY}$$

$$\frac{0.408625 \text{ lb/hr} \times 7.00E{+}03 \text{ gr/lb}}{1175 \text{ dscfm} \times 60 \text{ min/hr}} = 0.04 \text{ gr/dscf}$$

Carbon Monoxide (CO)

$$\frac{175 \text{ lb/hr} \times 2.95 \text{ lb/ton} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}}{} = 0.258125 \text{ lb/hr} = 0.48321 \text{ TPY}$$

$$\frac{0.258125 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.028 \text{ m}^3/\text{ft}^3 \times 1.14 \text{ mg/m}^3} = 52.08 \text{ ppmv}$$

Hydrocarbons (TOC/VOC - methane)

$$\frac{175 \text{ lb/hr} \times 2.99E{-}01 \text{ lb/ton} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}}{} = 0.026163 \text{ lb/hr} = 0.048976 \text{ TPY}$$

$$\frac{0.0261625 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 0.65 \text{ mg/m}^3} = 9.16 \text{ ppmv}$$

Notes:
1. Incinerator Emissions based on EPA emissions from Table 2.3-1 and 2.3-2 of AP-42 (5th Edition)
2. All conversion factors from AP-42 Appendix A.

Compliance with MDE Regulation - Particulates

26.11.08.05

.05 Particulate Matter.

. . .

B. Requirements for Areas III and IV.

(1) Calculations. Except as provided in Regulations .08 and .08 -2 of this chapter, incinerator or hazardous waste incinerator emissions shall be adjusted to 12 percent carbon dioxide.

(2) Except as provided in Regulations .07, .08, and .08 -2 of this chapter, a person may not cause or permit the discharge of particulate matter into the outdoor atmosphere from any incinerator, hazardous waste incinerator, or crematory to exceed the following limitations:

(a) Special medical waste incinerators burning less than 1 ton of refuse per hour and less than 8 tons of refuse per day and crematories, 0.10 grains per standard cubic foot dry **0.10 gr/SCFD** (229 mg/dscm);

(b) All other incinerators and hazardous waste incinerators, **0.03 gr/SCFD** (68.7 mg/dscm).

Particulate Emissions for the Power-Pak II Plus are lower than 0.10 gr/dscf @ 7%O_2

Compliance with MDE Regulation – CO

26.11.08.04

.04 Carbon Monoxide in Areas III and IV.

A. Applicability and Exceptions.

(1) This regulation is applicable only in Areas III and IV.

(2) This regulation applies to any person who owns or operates any installation that discharges carbon monoxide gas at a rate exceeding 500 pounds (227 kilograms) per day and at a concentration exceeding 12 percent by volume.

. .

B. General Requirements.

(1) A person may not cause or permit the discharge of carbon monoxide gas into the atmosphere from any installation unless it is burned in a direct flame afterburner with excess oxygen for at least 0.3 second at a temperature of at least 1,300°F.

(2) The direct flame afterburner shall be equipped with a properly functioning recording pyrometer located and positioned in the work area so that it is readily visible to the operator of the installation.

The Power-Pak II Plus produces very minimal Carbon Monoxide:

3.00 ppm @ 7%O_2

AND

1. Secondary chamber of cremation unit has a retention time of above 1.0 second
2. Records and displays temperature of the secondary chamber during operation to comply with MDE requirements.

Emission Reduction Measures

✓Installation of temperature monitor and recorder for constant verification of correct operations

✓ > 1 second retention time in secondary chamber @ 1600˚ F

✓No burning of PVC plastic bags

Community Contact

Courtney Miller

410-804-9146

cmiller@vcgfs.com

Questions