# CONSTRUCTION PERMIT APPLICATION
# (including Greenhouse Gas Emissions Evaluation)

## LaFollette Medical Center
## Emission Source 07-0027-01
## LaFollette, Tennessee

**AMEC Project No. 568460000**

Submitted to:

**Tennessee Division of Air Pollution Control**
**9th Floor, L&C Annex**
**401 Church Street**
**Nashville, Tennessee 37243-1531**

Prepared by:

**AMEC Environment & Infrastructure, Inc.**
**3800 Ezell Road, Suite 100**
**Nashville, Tennessee 37211**

**January 23, 2012**

January 23, 2012

Mr. Barry Stephens, P.E. Division Director
Tennessee Division of Air Pollution Control
9th Floor, L&C Annex
401 Church Street
Nashville, Tennessee 37243-1531



ATTN: Hymelia Craig

**RE: Construction Permit Application Package including Greenhouse Gas Emissions Evaluation**
**LaFollette Medical Center**
**Emission Source 07-0027-01**
**LaFollette, TN**
AMEC Project No. 568460000

Dear Ms. Craig:

AMEC Environment & Infrastructure, Inc. (AMEC) is submitting the enclosed permit application on behalf of the LaFollette Medical Center in LaFollette, Tennessee. This facility, identified as Emission Source No. 07-0027-01, was previously known as the St. Mary's Medical Center of Campbell County, but has recently undergone a name change to the LaFollette Medical Center.

The facility's permit, Permit Number 009562F, was issued in May of 1980 for four boilers present at the medical center. A recent review of the facility's records at the Tennessee Division of Air Pollution Control (TDAPC) offices in Nashville, indicated that historical documentation for the facility is limited and it is possible that the appropriate paperwork was not filed for the replacement of three of the boilers. In addition, two emergency generators have also been added to the facility. Therefore, at this time we are submitting a construction permit application with the appropriate TDAPC forms for the emission units present at the LaFollette Medical Center.

In support of the information needed on the TDAPC forms and to start a clear record of the units present at the facility, we have restructured the emission point numbering system. The combustion units currently present at the facility, each with a separate exhaust stack, are re-numbered below with the year of construction noted in parentheses:

No. 10 - Kewanee Low Pressure Boiler (1977);
No. 11 - John Deere Emergency Generator (1996);
No. 12 - Superior Boiler (1999);
No. 13 - Caterpillar Emergency Generator (2003);
No. 14 - BP Boiler (2005); and
No. 15 - Cleaver Brooks Boiler (2009).

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The permit application package also includes an evaluation of maximum potential to emit (PTE) and estimated average emissions for both criteria air pollutants and greenhouse gases. The average emissions are based on facility emissions in 2010. Greenhouse gas (GHG) emissions in tons per year are expressed as carbon dioxide equivalents (CO2e).

Pursuant to guidance provided by TDAPC, the GHG emissions associated with each permitted and insignificant emission source at the facility were calculated using the U.S. Environmental Protection Agency (USEPA) default emission factors. Emissions were estimated for the individual GHG pollutants, including carbon dioxide ($CO_2$), nitrous oxide ($N_2O$), and methane ($CH_4$). Emissions were initially presented in metric tons, and then summed and converted to short tons. Hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulfur hexafluoride ($SF_6$) substances are not known to be used at the facility, and thus there are no known emissions of these substances.

The maximum PTE for nitrogen oxides (NOx) for the emission units at the facility is over 10 tons per year. Based on this emission rate and the TDAPC Schedule A for Construction Permit Fees, the fee for this construction permit application is $500, which is also enclosed.

If you have any questions regarding this information, please contact Mr. Charles Johnson of the LaFollette Medical Center at (423) 907-1651 or Ms. Sara Mathews of AMEC Environment and Infrastructure, Inc. at (615) 333-0630.

Sincerely,
**AMEC Environment & Infrastructure, Inc.**

Kathleen D. Regan
Principal Engineer
*email: kathleen.regan@amec.com*

Sara B. Mathews
Senior Environmental Scientist
*email: sara.mathews@amec.com*

Enclosure 1 – TDAPC Forms and Emissions Evaluation

Enclosure 2 – TDAPC Fee Payment

cc: Mr. Charles E. Johnson, LaFollette Medical Center

**Enclosure 1**

**TDAPC Forms and Emissions Evaluation**

## List of Forms

| Form | Form Name | Page |
|---|---|---|
| APC20 | Permit Application | 2 pages total |
| APC21 | Process or Fuel Burning Source Description | 2 pages for each unit |
| APC 22 | Emission Point Description | 2 pages for each unit |
| APC Attachment | Emissions Estimates | 1 page for each unit |
| Attachment APC 22 | GHG Emissions | 3 pages total |

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL

NOT TO BE USED FOR TITLE V APPLICATIONS



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FAX: (615) 532-0614

# PROCESS OR FUEL BURNING SOURCE DESCRIPTION

APC21(& 24)



PLEASE TYPE OR PRINT, SUBMIT IN DUPLICATE AND ATTACH TO THE PERMIT APPLICATION.

| 1. ORGANIZATION NAME<br>LaFollette Medical Center | | / / /<br>FOR | APC COMPANY-POINT NO. |
|---|---|---|---|
| 2. EMISSION SOURCE NO. ( AS ON PERMIT APPLICATION )<br>07-0027-01 | SIC CODE<br>801102 | / / /<br>APC | APC PERMIT/LOG NO. |

**3. DESCRIPTION OF PROCESS OR FUEL BURNING UNIT**
John Deere Emergency Generator, 180 kW

| 4. NORMAL OPERATION: → | HOURS/DAY<br>5 | DAYS/WEEK<br>2 | WEEKS/YEAR<br>52 | DAYS/YEAR |
|---|---|---|---|---|
| 5. PERCENT ANNUAL THROUGHPUT: → | DEC.-FEB.<br>25% | MARCH-MAY<br>25% | JUNE-AUG.<br>25% | SEPT.-NOV.<br>25% |

| 6. TYPE OF PERMIT APPLICATION | ( CHECK BELOW ONE ONLY ) |
|---|---|
| PROCESS SOURCE: APPLY FOR A SEPARATE PERMIT FOR EACH SOURCE. ( CHECK AT RIGHT, AND COMPLETE LINES 7, 8, 13, AND 14 ). | ( ) |
| PROCESS SOURCE WITH IN-PROCESS FUEL:PRODUCTS OF COMBUSTION CONTACT MATERIALS HEATED. APPLY FOR A SEPARATE PERMIT FOR EACH SOURCE. ( CHECK AT RIGHT, AND COMPLETE LINES 7, 8, AND 10 THROUGH 14 ) | ( ) |
| NON-PROCESS FUEL BURNING SOURCE: PRODUCTS OF COMBUSTION DO NOT CONTACT MATERIALS HEATED. COMPLETE THIS FORM FOR EACH BOILER OR FUEL BURNER AND COMPLETE AN EMISSION POINT DESCRIPTION FORM ( APC 22 ) FOR EACH STACK. ( CHECK AT RIGHT, AND COMPLETE LINES 9 TO 14 ) | (X) |

| 7. TYPE OF OPERATION: CONTINUOUS , ( ) | BATCH ( ) | NORMAL BATCH TIME | NORMAL BATCHES/DAY |
|---|---|---|---|

| 8. PROCESS MATERIAL INPUTS AND IN-PROCESS SOLID FUELS | DIAGRAM* REFERENCE | INPUT RATES (POUNDS/HOUR) DESIGN | INPUT RATES (POUNDS/HOUR) ACTUAL | / / | (FOR APC USE ONLY) SCC CODE |
|---|---|---|---|---|---|
| A. | | | | / / | |
| B. | | | | / / | |
| C. | | | | / / | |
| D. | | | | / / | |
| E. | | | | / / | |
| F. | | | | / / | |
| G. | | | | / / | |
| TOTALS | | | | / / | |

* A SIMPLE PROCESS FLOW DIAGRAM MUST BE ATTACHED.

( OVER )

APC 21 (& 24)

**9. BOILER OR BURNER DATA:** ( COMPLETE LINES 9 TO 14 USING A SEPARATE FORM FOR EACH BOILER )

| BOILER NUMBER | STACK NUMBER** | TYPE OF FIRING*** | RATED BOILER HORSEPOWER | RATED INPUT CAPACITY ($10^6$ BTU/HR) | OTHER BOILER RATING (SPECIFY CAPACITY AND UNITS) |
|---|---|---|---|---|---|
| 11 | 11 | oil burner | | 1.69 | |

| BOILER SERIAL NO. | DATE CONSTRUCTED | DATE OF LAST MODIFICATION (EXPLAIN IN COMMENTS BELOW). |
|---|---|---|
| 358450 | 1996 | |

** BOILERS WITH A COMMON STACK WILL HAVE THE SAME STACK NUMBER.
*** CYCLONE, SPREADER ( WITH OR WITHOUT REINJECTION ), PULVERIZED ( WET OR DRY BOTTOM, WITH OR WITHOUT REINJECTION ), OTHER STOKER ( SPECIFY TYPE ), HAND FIRED, AUTOMATIC, OR OTHER TYPE ( DESCRIBE BELOW IN COMMENTS ).

**10. FUEL DATA:** ( COMPLETE FOR A PROCESS SOURCE WITH IN-PROCESS FUEL OR A NON-PROCESS FUEL BURNING SOURCE )

PRIMARY FUEL TYPE ( SPECIFY ) Natural Gas and/or Fuel Oil #2 — STANDBY FUEL TYPE( S ) ( SPECIFY )

| FUELS USED | ANNUAL USAGE | HOURLY USAGE DESIGN | HOURLY USAGE AVERAGE | % SULFUR | % ASH | BTU VALUE OF FUEL | | (FOR APC ONLY) SCC CODE |
|---|---|---|---|---|---|---|---|---|
| NATURAL GAS: | $10^6$ CUFT | CUFT | CUFT | | | 1,000 | | |
| #2 FUEL OIL: | $10^3$ GAL 6.05 | GAL 12.1 | GAL 12.1 | 0.0015% | NA | 140,000 | | |
| #5 FUEL OIL: | $10^3$ GAL | GAL | GAL | | | | | |
| #6 FUEL OIL: | $10^3$ GAL | GAL | GAL | | | | | |
| COAL: | TONS | LBS | LBS | | | | | |
| WOOD: | TONS | LBS | LBS | | | | | |
| LIQUID PROPANE: | $10^3$ GAL | GAL | GAL | | | 85,000 | | |
| OTHER (.SPECIFY TYPE & UNITS.): | | | | | | | | |

**11. IF WOOD IS USED AS A FUEL, SPECIFY TYPES AND ESTIMATE PERCENT BY WEIGHT OF BARK**
NA

**12. IF WOOD IS USED WITH OTHER FUELS, SPECIFY PERCENT BY WEIGHT OF WOOD CHARGED TO THE BURNER.**
NA

**13. COMMENTS**

Emergency generator is assumed to have the maximum potential to operate 500 hours per year.

No information currently available to adjust maximum hourly usage to represent an average hourly usage in gallons per hour.

**14. SIGNATURE**  **DATE** 1/24/12

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# EMISSION POINT DESCRIPTION

APC 22



PLEASE TYPE OR PRINT AND SUBMIT IN DUPLICATE FOR EACH STACK OR EMISSION POINT. ATTACH TO THE PERMIT APPLICATION.

| | | | | |
|---|---|---|---|---|
| **1. ORGANIZATION NAME**<br>LaFollette Medical Center | | | / / /<br>FOR | APC COMPANY POINT NO. |
| **2. EMISSION SOURCE NO.** (FROM APPLICATION)<br>07-0027-01 | | FLOW DIAGRAM POINT NUMBER<br>11 | / / /<br>APC | APC SEQUENCE NO. |
| **3. LOCATION:** → | LATITUDE<br>N36°23.330' | LONGITUDE<br>W84°6.651 | UTM VERTICAL | UTM HORIZONTAL |
| **4. BRIEF EMISSION POINT DESCRIPTION** (ATTACH A SKETCH IF APPROPRIATE):<br>John Deere Emergency Generator, 180 kW | | | | DISTANCE TO NEAREST PROPERTY LINE (FT)<br>200 |

COMPLETE LINES 5 AND 6 IF DIFFERENT FROM THAT ON THE PROCESS OR FUEL BURNING SOURCE DESCRIPTION (APC 21)

| | | | | | |
|---|---|---|---|---|---|
| **5. NORMAL OPERATION:** → | HOURS/DAY | DAYS/WEEK | WEEK/YEAR | | DAYS/YEAR |
| **6. PERCENT ANNUAL THROUGHPUT:** → | DEC.-FEB. | MARCH-MAY | JUNE-AUG. | | SEPT.-NOV. |
| **7. STACK OR EMISSION POINT DATA:** → | HEIGHT ABOVE GRADE ( FT )<br>9 ft | DIAMETER (FT)<br>6" | TEMPERATURE (°F)<br>450-500 | % OF TIME OVER 125°F<br>100% | DIRECTION OF EXIT (UP, DOWN OR HORIZONTAL)<br>Horizontal |
| DATA AT EXIT CONDITIONS: → | FLOW (ACTUAL $FT^3$/MIN. )<br>NA | VELOCITY (FT/SEC)<br>NA | MOISTURE ($GRAINS/FT^3$)<br>NA | | MOISTURE (PERCENT)<br>NA |
| DATA AT STANDARD CONDITIONS: → | FLOW (DRY STD. $FT^3$/MIN)<br>NA | VELOCITY (FT/SEC)<br>NA | MOISTURE ($GRAINS/FT^3$)<br>NA | | MOISTURE (PERCENT)<br>NA |

| **8. AIR CONTAMINANTS** | ACTUAL EMISSIONS | | | | | | |
|---|---|---|---|---|---|---|---|
| | EMISSIONS (LBS/HR) | | CONCENTRATION | AVG. EMISSIONS (TONS/YR) | EMISSIONS* EST. | CONTROL DEVICES* | CONTROL EFFICIENCY% |
| | AVERAGE | MAXIMUM | | | | | |
| PARTICULATES | 0.53 | 0.53 | ** | 0.018 | 3 | | |
| SULFUR DIOXIDE | 0.49 | 0.49 | *** | 0.016 | 3 | | |
| CARBON MONOXIDE | 1.61 | 1.61 | PPM | 0.053 | 3 | | |
| ORGANIC COMPOUNDS | 0.55 | 0.55 | PPM | 0.018 | 3 | | |
| NITROGEN OXIDES | 7.48 | 7.48 | PPM | 0.25 | 3 | | |
| FLUORIDES | | | | | | | |
| OTHER( SPECIFY )<br>GHG emissions | | | | 9.12 short tons | 5 | | |
| OTHER( SPECIFY ) | | | | | | | |

( OVER )

**9. CHECK TYPES OF MONITORING AND RECORDING INSTRUMENTS THAT ARE ATTACHED:**
OPACITY MONITOR ( ), SO2 MONITOR ( ), NOX MONITOR ( ), OTHER (SPECIFY IN COMMENTS) ( ) Not Applicable

**10. COMMENTS**

| **11. SIGNATURE** | **DATE** |
|---|---|
| | 1/24/12 |

* REFER TO THE BACK OF THE PERMIT APPLICATION FORM FOR ESTIMATION METHOD AND CONTROL DEVICE CODES.

** EXIT GAS PARTICULATE CONCENTRATION UNITS: PROCESS — GRAINS/DRY STANDARD FT3 ( 70°F ); WOOD FIRED BOILERS — GRAINS/DRY STANDARD FT3 ( 70°F ); ALL OTHER BOILERS — LBS/MILLION BTU HEAT INPUT.

*** EXIT GAS SULFUR DIOXIDE CONCENTRATIONS UNITS: PROCESS — PPM BY VOLUME, DRY BASES; BOILERS — LBS/MILLION BTU HEAT INPUT.

**APC 22 Attachment - Emission Source 07-0027-01**
**Calculation of Emissions for John Deere Emergency Generator - 180 kW; 1.69 MMBTU/hr**
**LaFollette Medical Center, LaFollette, TN**

| Unit | Generator Rating (kw) | Generator Rating (hp) | Heat Input (MMBtu/hr) | Run Time (1) (hr/yr) | Annual Power Output (Kw-hr/yr) | Annual Power Output (hp-hr/yr) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|---|---|
| Emergency Generator | 180 | 241.38 | 1.68966 | 500 | 90000 | 120690 | 844.83 |

(1) No operating limit for emergency generators used under emergency situations; assumed 500 hour/year for emissions
Average usage is approximately 66 hours per year.

Calculation of Unit Rating
Unit rating (kw) x 1.341 (hp/kw) = Unit rating (hp)

Calculation of Heat Input
Generator Rating (kw) x 1.341 (hp/kw) x 7000 (BTU/hp-hr) / 1,000,000 (BTU/MMBtu) = Heat Input (MMBtu/hr)
Note: The emission factors in AP-42 take into account the approximately 35% efficiency of internal combustion engines.

**Emissions Evaluation**

| Constituent | Source | Emission Factor (lb/hp-hr) | Emissions (lb/hr) | Emissions (lb/year) | Emissions (tons/year) |
|---|---|---|---|---|---|
| NOx | AP-42 | 0.03100 | 7.48 | 3741.39 | 1.87 |
| CO | AP-42 | 0.00668 | 1.61 | 806.21 | 0.403 |
| TOC | AP-42 | 0.00251 | 0.61 | 302.93 | 0.151 |
| Nonmethane HC (VOC) | AP-42 | 0.00228 | 0.55 | 275.67 | 0.138 |
| PM10 (TSP) | AP-42 | 0.00220 | 0.53 | 265.52 | 0.133 |
| SO2 | AP-42 | 0.00205 | 0.49 | 247.41 | 0.124 |

Conversion factors: 0.002205 lb/gram
0.0005 tons/lb

Notes:
Assumes VOCs represent 91% of total organic carbon emissions.
AP-42 Chapter 3.3, 10/96.

**Average Evaluation - 66 hours/year**
**Calculation of Emissions for John Deere Emergency Generator - 180 kW; 1.69 MMBTU/hr**
**LaFollette Medical Center, LaFollette, TN**

| Unit | Generator Rating (kw) | Generator Rating (hp) | Heat Input (MMBtu/hr) | Run Time (1) (hr/yr) | Annual Power Output (Kw-hr/yr) | Annual Power Output (hp-hr/yr) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|---|---|
| Emergency Generator | 180 | 241.38 | 1.68966 | 66 | 11880 | 15931.08 | 111.51756 |

(1) No operating limit for emergency generators used under emergency situations; assumed 500 hour/year for emissions
Average usage is approximately 66 hours per year.

Calculation of Unit Rating
Unit rating (kw) x 1.341 (hp/kw) = Unit rating (hp)

Calculation of Heat Input
Generator Rating (kw) x 1.341 (hp/kw) x 7000 (BTU/hp-hr) / 1,000,000 (BTU/MMBtu) = Heat Input (MMBtu/hr)
Note: The emission factors in AP-42 take into account the approximately 35% efficiency of internal combustion engines.

**Emissions Evaluation**

| Constituent | Source | Emission Factor (lb/hp-hr) | Emissions (lb/hr) | Emissions (lb/year) | Emissions (tons/year) |
|---|---|---|---|---|---|
| NOx | AP-42 | 0.03100 | 7.48 | 493.86 | 0.25 |
| CO | AP-42 | 0.00668 | 1.61 | 106.42 | 0.053 |
| TOC | AP-42 | 0.00251 | 0.61 | 39.99 | 0.020 |
| Nonmethane HC (VOC) | AP-42 | 0.00228 | 0.55 | 36.39 | 0.018 |
| PM10 (TSP) | AP-42 | 0.00220 | 0.53 | 35.05 | 0.018 |
| SO2 | AP-42 | 0.00205 | 0.49 | 32.66 | 0.016 |

Conversion factors: 0.002205 lb/gram
0.0005 tons/lb

Notes:
Assumes VOCs represent 91% of total organic carbon emissions.
AP-42 Chapter 3.3, 10/96.

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# PROCESS OR FUEL BURNING SOURCE DESCRIPTION

APC21(& 24)



PLEASE TYPE OR PRINT, SUBMIT IN DUPLICATE AND ATTACH TO THE PERMIT APPLICATION.

| 1. ORGANIZATION NAME<br>LaFollette Medical Center | | / / /<br>FOR | APC COMPANY-POINT NO. |
|---|---|---|---|
| 2. EMISSION SOURCE NO. ( AS ON PERMIT APPLICATION )<br>07-0027-01 | SIC CODE<br>801102 | / / /<br>APC | APC PERMIT/LOG NO. |

**3. DESCRIPTION OF PROCESS OR FUEL BURNING UNIT**
Caterpillar Emergency Generator, 800 kW

| 4. NORMAL OPERATION: → | HOURS/DAY<br>5 | DAYS/WEEK<br>2 | WEEKS/YEAR<br>52 | DAYS/YEAR |
|---|---|---|---|---|
| 5. PERCENT ANNUAL THROUGHPUT: → | DEC.-FEB.<br>25% | MARCH-MAY<br>25% | JUNE-AUG.<br>25% | SEPT.-NOV.<br>25% |

| 6. TYPE OF PERMIT APPLICATION | ( CHECK BELOW ONE ONLY ) |
|---|---|
| PROCESS SOURCE: APPLY FOR A SEPARATE PERMIT FOR EACH SOURCE. ( CHECK AT RIGHT, AND COMPLETE LINES 7, 8, 13, AND 14 ). | ( ) |
| PROCESS SOURCE WITH IN-PROCESS FUEL:PRODUCTS OF COMBUSTION CONTACT MATERIALS HEATED. APPLY FOR A SEPARATE PERMIT FOR EACH SOURCE. ( CHECK AT RIGHT, AND COMPLETE LINES 7, 8, AND 10 THROUGH 14 ) | ( ) |
| NON-PROCESS FUEL BURNING SOURCE: PRODUCTS OF COMBUSTION DO NOT CONTACT MATERIALS HEATED. COMPLETE THIS FORM FOR EACH BOILER OR FUEL BURNER AND COMPLETE AN EMISSION POINT DESCRIPTION FORM ( APC 22 ) FOR EACH STACK. ( CHECK AT RIGHT, AND COMPLETE LINES 9 TO 14 ) | (X) |

| 7. TYPE OF OPERATION: CONTINUOUS , | BATCH | NORMAL BATCH TIME | NORMAL BATCHES/DAY |
|---|---|---|---|
| ( ) | ( ) | | |

| 8. PROCESS MATERIAL INPUTS AND IN-PROCESS SOLID FUELS | DIAGRAM* REFERENCE | INPUT RATES (POUNDS/HOUR) DESIGN | ACTUAL | / / | (FOR APC USE ONLY) SCC CODE |
|---|---|---|---|---|---|
| A. | | | | / / | |
| B. | | | | / / | |
| C. | | | | / / | |
| D. | | | | / / | |
| E. | | | | / / | |
| F. | | | | / / | |
| G. | | | | / / | |
| | TOTALS | | | / / | |

* A SIMPLE PROCESS FLOW DIAGRAM MUST BE ATTACHED.

( OVER )

APC 21 (& 24)

**9. BOILER OR BURNER DATA:** ( COMPLETE LINES 9 TO 14 USING A SEPARATE FORM FOR EACH BOILER )

| BOILER NUMBER | STACK NUMBER** | TYPE OF FIRING*** | RATED BOILER HORSEPOWER | RATED INPUT CAPACITY ($10^6$ BTU/HR) | OTHER BOILER RATING (SPECIFY CAPACITY AND UNITS) |
|---|---|---|---|---|---|
| 13 | 13 | oil burner | | 7.5 | |

| BOILER SERIAL NO. | DATE CONSTRUCTED | DATE OF LAST MODIFICATION (EXPLAIN IN COMMENTS BELOW). |
|---|---|---|
| 3FZ04531 | 2003 | |

** BOILERS WITH A COMMON STACK WILL HAVE THE SAME STACK NUMBER.
*** CYCLONE, SPREADER ( WITH OR WITHOUT REINJECTION ), PULVERIZED ( WET OR DRY BOTTOM, WITH OR WITHOUT REINJECTION ), OTHER STOKER ( SPECIFY TYPE ), HAND FIRED, AUTOMATIC, OR OTHER TYPE ( DESCRIBE BELOW IN COMMENTS ).

**10. FUEL DATA:** ( COMPLETE FOR A PROCESS SOURCE WITH IN-PROCESS FUEL OR A NON-PROCESS FUEL BURNING SOURCE )

PRIMARY FUEL TYPE ( SPECIFY ) Natural Gas and/or Fuel Oil #2 — STANDBY FUEL TYPE( S ) ( SPECIFY )

| FUELS USED | ANNUAL USAGE | HOURLY USAGE DESIGN | HOURLY USAGE AVERAGE | % SULFUR | % ASH | BTU VALUE OF FUEL | | (FOR APC ONLY) SCC CODE |
|---|---|---|---|---|---|---|---|---|
| NATURAL GAS: | $10^6$ CUFT | CUFT | CUFT | | | 1,000 | | |
| #2 FUEL OIL: | $10^3$ GAL 26.79 | GAL 53.57 | GAL 53.57 | 0.0015% | NA | 140,000 | | |
| #5 FUEL OIL: | $10^3$ GAL | GAL | GAL | | / / / / / | | | |
| #6 FUEL OIL: | $10^3$ GAL | GAL | GAL | | / / / / / | | | |
| COAL: | TONS | LBS | LBS | | | | | |
| WOOD: | TONS | LBS | LBS | / / / / / / / / | / / / / / | | | |
| LIQUID PROPANE: | $10^3$ GAL | GAL | GAL | / / / / / / / / | / / / / / | 85,000 | | |
| OTHER (.SPECIFY TYPE & UNITS.): | | | | | | | | |

**11. IF WOOD IS USED AS A FUEL, SPECIFY TYPES AND ESTIMATE PERCENT BY WEIGHT OF BARK**
NA

**12. IF WOOD IS USED WITH OTHER FUELS, SPECIFY PERCENT BY WEIGHT OF WOOD CHARGED TO THE BURNER.**
NA

**13. COMMENTS**

Emergency generator is assumed to have the maximum potential to operate 500 hours per year.

No information currently available to adjust maximum hourly usage to represent an average hourly usage in gallons per hour.

**14. SIGNATURE** — **DATE** 1/24/12

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# EMISSION POINT DESCRIPTION

APC 22



PLEASE TYPE OR PRINT AND SUBMIT IN DUPLICATE FOR EACH STACK OR EMISSION POINT. ATTACH TO THE PERMIT APPLICATION.

| | | | | |
|---|---|---|---|---|
| **1. ORGANIZATION NAME**<br>LaFollette Medical Center | | | / / /<br>FOR | APC COMPANY POINT NO. |
| **2. EMISSION SOURCE NO.** (FROM APPLICATION)<br>07-0027-01 | | FLOW DIAGRAM POINT NUMBER<br>13 | / / /<br>APC | APC SEQUENCE NO. |
| **3. LOCATION:** → | LATITUDE<br>N36°23.320 | LONGITUDE<br>W84°6.725 | UTM VERTICAL | UTM HORIZONTAL |
| **4. BRIEF EMISSION POINT DESCRIPTION** (ATTACH A SKETCH IF APPROPRIATE):<br>Caterpillar Emergency Generator, 800 kW | | | | DISTANCE TO NEAREST PROPERTY LINE (FT)<br>130 |

COMPLETE LINES 5 AND 6 IF DIFFERENT FROM THAT ON THE PROCESS OR FUEL BURNING SOURCE DESCRIPTION (APC 21)

| | | | | | |
|---|---|---|---|---|---|
| **5. NORMAL OPERATION:** → | HOURS/DAY | DAYS/WEEK | WEEK/YEAR | | DAYS/YEAR |
| **6. PERCENT ANNUAL THROUGHPUT:** → | DEC.-FEB. | MARCH-MAY | JUNE-AUG. | | SEPT.-NOV. |
| **7. STACK OR EMISSION POINT DATA:** → | HEIGHT ABOVE GRADE ( FT )<br>9 | DIAMETER (FT)<br>6" | TEMPERATURE (°F)<br>262-972 | % OF TIME OVER 125°F<br>100% | DIRECTION OF EXIT (UP, DOWN OR HORIZONTAL)<br>Horizontal |
| DATA AT EXIT CONDITIONS: → | FLOW (ACTUAL $FT^3$/MIN. )<br>NA | VELOCITY (FT/SEC)<br>NA | MOISTURE ($GRAINS/FT^3$)<br>NA | | MOISTURE (PERCENT)<br>NA |
| DATA AT STANDARD CONDITIONS: → | FLOW (DRY STD. $FT^3$/MIN)<br>NA | VELOCITY (FT/SEC)<br>NA | MOISTURE ($GRAINS/FT^3$)<br>NA | | MOISTURE (PERCENT)<br>NA |

| **8. AIR CONTAMINANTS** | ACTUAL EMISSIONS | | | | | | |
|---|---|---|---|---|---|---|---|
| | EMISSIONS (LBS/HR) | | CONCENTRATION | AVG. EMISSIONS (TONS/YR) | EMISSIONS* EST. | CONTROL DEVICES* | CONTROL EFFICIENCY% |
| | AVERAGE | MAXIMUM | | | | | |
| PARTICULATES | 0.75 | 0.75 | ** | 0.014 | 3 | | |
| SULFUR DIOXIDE | 0.01 | 0.01 | *** | 0.00023 | 3 | | |
| CARBON MONOXIDE | 5.90 | 5.90 | PPM | 0.11 | 3 | | |
| ORGANIC COMPOUNDS | 0.69 | 0.69 | PPM | 0.012 | 3 | | |
| NITROGEN OXIDES | 25.75 | 25.75 | PPM | 0.46 | 3 | | |
| FLUORIDES | | | | | | | |
| OTHER( SPECIFY )<br>GHG Emissions | | | | 22.11 short tons | 5 | | |
| OTHER( SPECIFY ) | | | | | | | |

( OVER )

**9. CHECK TYPES OF MONITORING AND RECORDING INSTRUMENTS THAT ARE ATTACHED:**
OPACITY MONITOR ( ), SO2 MONITOR ( ), NOX MONITOR ( ), OTHER (SPECIFY IN COMMENTS) ( ) Not Applicable

**10. COMMENTS**

| **11. SIGNATURE** | **DATE** |
|---|---|
| | 1/24/12 |

* REFER TO THE BACK OF THE PERMIT APPLICATION FORM FOR ESTIMATION METHOD AND CONTROL DEVICE CODES.

** EXIT GAS PARTICULATE CONCENTRATION UNITS: PROCESS — GRAINS/DRY STANDARD FT3 ( 70°F ); WOOD FIRED BOILERS — GRAINS/DRY STANDARD FT3 ( 70°F ); ALL OTHER BOILERS — LBS/MILLION BTU HEAT INPUT.

*** EXIT GAS SULFUR DIOXIDE CONCENTRATIONS UNITS: PROCESS — PPM BY VOLUME, DRY BASES; BOILERS — LBS/MILLION BTU HEAT INPUT.

**APC 22 Attachment - Emission Source 07-0027-01**
**Calculation of Emissions for Caterpillar Emergency Generator - 800 kW; 7.5 MMBTU/hr**
**LaFollette Medical Center, LaFollette, TN**

| Unit | Generator Rating (kw) | Generator Rating (hp) | Heat Input (MMBtu/hr) | Run Time (1) (hr/yr) | Annual Power Output (Kw-hr/yr) | Annual Power Output (hp-hr/yr) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|---|---|
| Emergency Generator | 800 | 1072.8 | 7.5096 | 500 | 400000 | 536400 | 3754.8 |

(1) No operating limit for emergency generators used under emergency situations; assumed 500 hour/year for emissions
Average usage is approximately 36 hours per year.

Calculation of Unit Rating
Unit rating (kw) x 1.341 (hp/kw) = Unit rating (hp)

Calculation of Heat Input
Generator Rating (kw) x 1.341 (hp/kw) x 7000 (BTU/hp-hr) / 1,000,000 (BTU/MMBtu) = Heat Input (MMBtu/hr)
Note: The emission factors in AP-42 take into account the approximately 35% efficiency of internal combustion engines.

**Emissions Evaluation**

| Constituent | Source | Emission Factor (lb/hp-hr) | Emissions (lb/hr) | Emissions (lb/year) | Emissions (tons/year) |
|---|---|---|---|---|---|
| NOx | AP-42 | 0.02400 | 25.75 | 12873.60 | 6.44 |
| CO | AP-42 | 0.00550 | 5.90 | 2950.20 | 1.475 |
| HC | AP-42 | 0.00071 | 0.76 | 378.16 | 0.189 |
| Nonmethane HC (VOC) | AP-42 | 0.00064 | 0.69 | 344.13 | 0.172 |
| PM | AP-42 | 0.00070 | 0.75 | 375.48 | 0.188 |
| SO2 | AP-42 | 1.2135E-05 | 0.01 | 6.51 | 0.003 |

Conversion factors: 0.002205 lb/gram
0.0005 tons/lb

Notes:
Based on AP-42, assumes VOCs represent 91% of hydrocarbon emissions.
Assumes sulfur content of diesel fuel of 0.0015%.
AP-42 Chapter 3.4, 10/96.

**Average Emissions - 36 hours/year**
**Calculation of Emissions for Caterpillar Emergency Generator - 800 kW; 7.5 MMBTU/hr**
**LaFollette Medical Center, LaFollette, TN**

| Unit | Generator Rating (kw) | Generator Rating (hp) | Heat Input (MMBtu/hr) | Run Time (1) (hr/yr) | Annual Power Output (Kw-hr/yr) | Annual Power Output (hp-hr/yr) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|---|---|
| Emergency Generator | 800 | 1072.8 | 7.5096 | 36 | 28800 | 38620.8 | 270.3456 |

(1) No operating limit for emergency generators used under emergency situations; assumed 500 hour/year for emissions
Average usage is approximately 36 hours per year.

Calculation of Unit Rating
Unit rating (kw) x 1.341 (hp/kw) = Unit rating (hp)

Calculation of Heat Input
Generator Rating (kw) x 1.341 (hp/kw) x 7000 (BTU/hp-hr) / 1,000,000 (BTU/MMBtu) = Heat Input (MMBtu/hr)
Note: The emission factors in AP-42 take into account the approximately 35% efficiency of internal combustion engines.

**Emissions Evaluation**

| Constituent | Source | Emission Factor (lb/hp-hr) | Emissions (lb/hr) | Emissions (lb/year) | Emissions (tons/year) |
|---|---|---|---|---|---|
| NOx | AP-42 | 0.02400 | 25.75 | 926.90 | 0.46 |
| CO | AP-42 | 0.00550 | 5.90 | 212.41 | 0.106 |
| HC | AP-42 | 0.00071 | 0.76 | 27.23 | 0.014 |
| Nonmethane HC (VOC) | AP-42 | 0.00064 | 0.69 | 24.78 | 0.012 |
| PM | AP-42 | 0.00070 | 0.75 | 27.03 | 0.014 |
| SO2 | AP-42 | 1.2135E-05 | 0.01 | 0.47 | 0.00023 |

Conversion factors: 0.002205 lb/gram
0.0005 tons/lb

Notes:
Based on AP-42, assumes VOCs represent 91% of hydrocarbon emissions.
Assumes sulfur content of diesel fuel of 0.0015%.
AP-42 Chapter 3.4, 10/96.