

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

G506733940

| | | |
|---|-------------------------------|------------------------------|
| FACILITY: WILLIAM BEAUMONT HOSPITAL | | SRN / ID: G5067 |
| LOCATION: 3601 W. 13 MILE RD., ROYAL OAK | | DISTRICT: Southeast Michigan |
| CITY: ROYAL OAK | | COUNTY: OAKLAND |
| CONTACT: Amy Blazejewski, Director of Environment and Life Safety | | ACTIVITY DATE: 03/02/2016 |
| STAFF: Rebecca Loftus | COMPLIANCE STATUS: Compliance | SOURCE CLASS: MAJOR |
| SUBJECT: | | |
| RESOLVED COMPLAINTS: | | |

On March 2, 2016, I, Rebecca Loftus, and Tyler Salamasick, from the Department of Environmental Quality's (DEQ) Air Quality Division (AQD), conducted an inspection of William Beaumont Hospital - Royal Oak Campus (Beaumont), State Registry Number (SRN): G5067, located at 3601 W 13 Mile Road, in Royal Oak, Michigan. The purpose of this inspection was to determine the Beaumont's compliance with the Federal Clean Air Act Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, Michigan's Air Pollution Control Rules, and the conditions established in Renewable Operating Permit (ROP) No. MI-ROP-G5067-2014.

Contacts

Upon arriving at the facility, Tyler and I met with the following staff:

Ms. Amy Blazejewski, Director of Environment and Life Safety, overall compliance contact, Amy.Blazejewski@beaumont.org, 248-551-8826.
Mr. Dave Mutschler, Electromechanical Senior Technician, sterilizers, 248-551-7384
Mr. Jim Gibson, Bio-medical Technician, sterilizers
Mr. Howard Bosch, Power Plant Leader, powerhouse, boilers, and generators
Mr. Eric Lewis, Beaumont Staff, garage and cold cleaners
Mr. Gary Cosart, Structural Services Lead, woodworking and paint booth
Mr. Andy Rusnak, Environmental Engineer at Derenzo and Associates, records, 517-324-1880

Permit Overview

ROP No. MI-ROP-G5067-2014

On September 2, 2014, ROP No. MI-ROP-G5067-2014 was issued to Beaumont for the operation of five boilers, 13 emergency reciprocating internal combustion engines (generators), four ethylene oxide sterilizers, two cold cleaners, a woodshop with dust collector, and a paint spray booth operated under Michigan's Rule 287(c) exemption.

PTI Nos. 180-12A and 205-02C; incorporated into ROP No. MI-ROP-G5067-2014.

Permit to Install (PTI) No. 180-12 included enforceable limits/language that designated all existing reciprocating internal combustion engines (RICE) as "emergency RICES". Changes to fuel requirements were also updated and complied in flexible group: FG-FUELOIL; The Boilers were also pulled into this permit because they can also use diesel as fuel. On November 18, 2013, Beaumont requested to modify PTI No. 180-12A to replace three existing RICES (EUELECGEN3, 4, and 5) with two CAT 3516C emergency RICES.

PTI No. 205-02B was issued to Beaumont because the existing Sterilizers used a sterilant blend that was phase out in the US and Beaumont needed to replace the three units with four new units (two

Model 8XL and two Model 5XL). PTI No. 205-02B only allowed three of the four units to operate at one time. On January 31, 2014, Beaumont applied for a modification to PTI 205-02B. Due to increase of sterilization demand Beaumont needed to modify their permit to allow all four units to operate simultaneously; and therefore increase the allowable emissions. In their application, Beaumont demonstrated that the two Model 5XL units can exhaust to the same scrubber simultaneously and still control emissions to a 99.5% reduction efficiency. PTI No. 205-02C was issued on March 13, 2014.

Facility Overview

During the inspection, Beaumont staff escorted us through the campus and explained the location and details of each process. Copies of all record keeping were provided at the time of the inspection and follow-up request were answered via email (see attached records/emails).

The Beaumont Royal Oak Campus consists of more than one million square feet of occupied space. The campus is equipped with five boilers which primarily combust natural gas to provide steam to the campus. The steam is used throughout the hospital for heating, sterilization, and cooking purposes. Hospitals are required to have a backup fuel supply in the event of a disruption of natural gas service to the facility; therefore, the facility's boilers are also capable of combusting fuel oil No. 2 for emergency purposes.

Similarly, hospitals are also required to maintain electrical service in the event of power outages; for this reason Beaumont now has a total of eight No. 2 oil emergency generators (some have been removed since the last inspection/permit issuance). In addition to the eight emergency generators, Beaumont has two cogeneration engines that can be utilized to supply power to the hospital; at this time the co-gen units are also re-classified as emergency use only.

The boilers, engines, and generators are located throughout the campus at the following locations:

| Location | Equipment |
|-------------------|--|
| West Powerhouse | Boilers 1 through 5, Cogen Engines 1 and 2, Emergency Generators #7, #8, 1R (known as #1) and 2R (known as #3) Note: Emergency Generator 1R replaced EU-ELECGEN3 and 2R replaced EU-ELECGEN4 and EU-ELECGEN5. |
| East Powerhouse | Emergency Generators 8 and 9 (known as East Generators #1 and #2) |
| Research Building | Two emergency generators labeled Research Generators #1 and #2. Research Generator #3 was dismantled on 9/30/2013. |

Beaumont also has multiple fuel oil storage tanks: two 20,000 gallon and three new 40,000 gallon diesel storage tanks are located near the West Powerhouse, one 40,000 gallon diesel storage tank is located near the East Powerhouse, and two 6,000 gallon gasoline storage tanks are located outside the Research & Development building.

In the basement of the hospital, Beaumont operates four ethylene oxide sterilizers to sterilize surgical instruments and tools. The ethylene oxide emissions are controlled by three acidic scrubbers.

Throughout the campus, Beaumont operates miscellaneous equipment that has the potential to emit air contaminants of concern, including: cold cleaners, a paint spray booth, a woodshop sander with dust collector, welding equipment, research boilers, and hot water heaters.

A list of on-site equipment (permitted and exempt) containing descriptions, locations, and applicable regulations can be found at the end of this inspection report.

Boilers

The five boilers at Beaumont are covered under multiple flexible groups in the ROP: EU-BOILER1, FG-BOILER2&3, FG-BOILER4&5, and the fuel for the entire facility can be found under FG-FUELOIL. At the time of my inspection, Boilers #1, #2 and #4 were operating; no visible emissions were observed from their stacks. Mr. Bosch explained in the winter Beaumont operates more boilers because of the heating demand; in the summer months Beaumont only needs to operate two boilers at a time.

The routine preventative maintenance events for all hospital equipment, including the boilers and emergency generators, are recorded on a weekly, monthly, and yearly basis, by a computer software program (360 System). AQD staff verified that the facility is maintaining these records during the inspection (see attached examples). With the recent permit changes and removal of some equipment, I asked Beaumont to provide updated Preventative Maintenance Plans (PMPs) for the boilers and engines, as required by the ROP. Mr. Andy Rusnak, from Derenzo and Associates, will be updating the PMPs for the boilers and emergency generators this year and will email copies to the AQD.

Mr. Bosch provided copies of the 1st of the month, 15th, and end of the month daily emissions reports for 2015 and 2016; these reports include the fuel usage, hours of operation, and emissions data (daily and 12-month rolling) for all boilers and generators (see attached records). All daily/monthly records are also readily available on-site.

EU-BOILER 1

Boiler #1 was installed on January 1, 1978. This boiler is a "Keeler Model No. DS-30 Boiler" with a heat input capacity of 39 MMBtu/hour, is capable of producing 30,000 pounds of steam per hour, and can combust natural gas or fuel oil No. 2.

Based on the provided 12-month rolling emission records, Boiler #1 emitted 5.9 tons of NOx and 1.4 pounds of SO2 in 2015. From January through December 2015, Beaumont used 90,476,000 cubic feet of natural gas and 65 gallons of diesel in Boiler 1.

FG-BOILER2&3

Boiler #2 (installed 2/1/1998) and Boiler #3 (installed 6/26/2002) are both "Cleaver-Brooks Model D-60E" boilers. Each have a heat input capacity of 48.2 MMBtu/hour using natural gas fuel and 46.4 MMBtu/hour using fuel oil No. 2. Each boiler is capable of producing 40,000 pounds of steam per hour and can combust natural gas or fuel oil No. 2.

The ROP establishes a natural gas usage limit of 420MMscf and a fuel oil No. 2 usage limit of 200,000 gallons per 12-month rolling period for each boiler individually. As of December 2015, the 12-month rolling records indicate Boiler #2 combusted 159.37 MMscf of natural gas and 134 gallons of fuel oil, and Boiler #3 combusted 118.15 MM cubic feet of natural gas and 29 gallons of fuel oil

Each boiler has a SO2 emission limit of 247.2 pounds per day and a NOx emission limit of 23 tons per 12-month rolling period. The daily records indicate Boiler #2 and #3 are below their daily NOx limit and the 12-month rolling records indicate that Boiler #2 emitted 2.9 pounds of SO2 and 10.36 tons of NOx and Boiler #3 emitted 0.6 pounds of SO2 and 7.68 tons of NOx. The low sulfur emissions coincide with the low diesel usage and the "ultra-low" sulfur fuel.

FG-BOILER4&5

Boiler #4 is an "Erie City Boiler" with a heat input capacity of 48 MMBTU/hour using natural gas fuel and 46.4 MM BTU/hour using fuel oil No. 2. The boiler is capable of producing 40,000 pounds of steam per hour and can combust natural gas or fuel oil No. 2.

Boiler #5 is a "Keeler Model No. DS-40 Boiler" with a heat input capacity has a heat capacity of 48 MMBTU/ hour and is capable of producing 40,000 pounds of steam per hour and can combust natural gas or fuel oil No. 2.

The ROP establishes natural gas usage limit of 693.8 MM cubic feet and a fuel oil usage limit of 5,250 gallons for Boilers #4 and #5 combined per 12-month rolling period. As of December 2015, the 12-month rolling records indicate that 106.47 MMscf of natural gas and 62 gallons of fuel oil were combusted by the two boilers.

Boilers #4 and #5 share a 240 pounds per day SO₂ emission limit and a 48.5 tons NO_x emission limit per 12-month rolling period. The 12-month rolling records indicate that 1.3 pounds of SO₂ and 6.92 tons of NO_x were emitted. Again, the low sulfur emissions coincide with the low diesel usage and the "ultra-low" sulfur fuel.

FG-FUELOIL

FG-FUELOIL is comprised of emission units that are subject to sulfur dioxide emission standards and a fuel oil certification; these units include: EU-BOILER1, EU-BOILER2, EU-BOILER3, EU-BOILER4, EU-BOILER5, EU-COGEN1, EU-COGEN2, EU-ELECGEN3, EU-ELECGEN4, EU-ELECGEN5, EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1, and EU-RESGEN2. Each of fuel shipment for these emission units is required to contain no more than 0.20% sulfur by weight.

On February 2, 2016, Beaumont reported the following fuel oil shipments. As required by their permit, Beaumont received a certification from the supplier for each shipment stating the fuel contained less than 0.0015% by weight if sulfur (below the permit limit).

Shipments:

7/15/15 - Tanks No. 9, 11 and 15

11/11/15 - Portable Tank

11/16/15 and 11/17/15 - Tank No. 15.

Emergency Generators

In 2013, Beaumont applied for a permit to reclassify all on-site generators, including the two cogeneration units, as emergency use only. The PTI conditions were incorporated into two flexible groups in the ROP: FG-EMERGENCY and FG-ELECGEN1&2R.

As noted above, routine preventative maintenance events for all hospital equipment, including the boilers and emergency generators, are recorded on a weekly, monthly, and yearly basis, by a computer software program; these records are readily available on-site. Mr. Rusnak, will be updating the PMPs for the boilers and emergency generators this year and will email copies to the AQD.

FG-EMERGENCY

FG-EMERGENCY is comprised of seven engines that were permitted in PTI No. 180-12A; each is classified as existing institutional emergency stationary reciprocating internal combustion engine

located at an area source of hazardous air pollutants under 40 CFR, Part 63, Subpart ZZZZ. This flexible group also includes four existing institutional emergency stationary reciprocating internal combustion engines that were exempt from obtaining a Permit to Install pursuant to Rule 285(g). Emission units: EU-COGEN1, EU-COGEN2, EU-ELECGEN3, EU-ELECGEN4, EU-ELECGEN5, EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1, EU-RESGEN2.

During my inspection, I noted the following emergency engines have been removed:

| Emission Unit ID | Installation Date/ Modification Date | Dismantle Date |
|------------------|---|----------------|
| EU-ELECGEN3 | 1/1/1973 | 7/31/2014 |
| EU-ELECGEN4 | 1/1/1985 | 8/31/2015 |
| EU-ELECGEN5 | 7/31/1993 | 8/31/2015 |
| EU-RESGEN3 | --- | 9/30/2013 |

The ROP requires each engine to not operate for more than 500 hours per year on a 12 month rolling time period basis and each engine must have non-resettable hours meter to track the operating hours.

Mr. Bosch provided copies of the 2015-2016 Daily/Weekly/Monthly Engine Reports (see attached). These records include the following for each unit: the hours on the engine meter, the total hours of operated, the amount of hours the unit was operated in test mode versus the amount operated in emergency mode, the type and amount of fuel used, and the total kilowatts produced. The following is a summary of the total hours for each unit; based on this information, Beaumont is below the 500 hour restriction for each unit.

| Engine ID | Hours Operated in 2015 |
|-------------------------|---------------------------------|
| EU-COGEN1 (Engine A) | 62.1 |
| EU-COGEN2 (Engine B) | 61.9 |
| EU-ELECGEN3 | NA (dismantled) |
| EU-ELECGEN4 | 50.3 |
| EU-ELECGEN5 | 54.0 |
| EU-ELECGEN6 | 97.9 |
| EU-ELECGEN7 | 94.2 |
| EU-ELECGEN8 (East #1) | 47.0 |
| EU-ELECGEN9 (East #2) | 40.0 |
| EU-RESGEN1 (Gen Lab #1) | 40.0 |
| EU-RESGEN2 (Gen Lab #2) | 38.0 |
| EU-ELECGEN1R (New #1) | 91.3 |
| EU-ELECGEN2R (New #3) | NA (did not operate until 2016) |

This flexible group also establishes a NOx emission limit of 82.2 tons for EU-COGEN1&2, and requires records for natural gas and fuel oil usage for these units. As of December 2015, the 12-month rolling records indicate that COGEN1 combusted no natural gas and 4115.95 gallons of fuel oil and COGEN2

combusted 56,000 scfm natural gas and 3569.63 gallons of fuel oil. The 12-month rolling records indicate that the two units together emitted 1806.9 pounds of NOx.

FG-EMERGENCY, Special Condition VI.6., requires Beaumont to record the following information for each unit: engine manufacturer, date engine was manufactured, engine model number, engine horsepower, engine serial number, engine specification sheet, date of initial startup of the engine, and date engine was removed from service at this stationary source.

An updated engine inventory was provided via email on March 17, 2016 (see attached list).

FG-ELECGEN1&2R

This flexible group includes two 2,000 kilowatts, diesel-fueled, CAT 3516C, emergency engines. Although the permit states these engines were manufactured in 2013, at the time of my inspection, I noted they were manufactured in 2014; the change in manufactured date does not affect applicable regulatory requirements. These engines are subject to the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 CFR, Part 60, Subpart IIII.

Per FG-ELECGEN1&2, Special Condition No VII.1 and VII.2, Beaumont is required to report the initial startups of 1R and 2R. On June 30, 2015, Beaumont reported the installation of 1R was complete, and on January 27, 2016, Beaumont reported the installation of 2R was complete. In addition, Beaumont certified that EU-ELECGEN1R and 2R are certified engines and will be operated in a certified manner to maintain compliance with Subpart IIII and the ROP.

At the time of my inspection, I noted that each engine had a certified engine plate identifying them as certified Caterpillar engines belonging to engine family: ECPXL78.1NZS.

Per EPA's website, <https://www3.epa.gov/otaq/certdata.htm#lsi>, the engines' certificate number is ECPXL78.1NZS-024 and each engine has the following certified emission factors (g/kW-hr²):

| Steady State NMHC | Steady State NOX | Steady State NMHC+NOX | Steady State CO | Steady State PM | Steady State CO2 |
|-------------------|------------------|-----------------------|-----------------|-----------------|------------------|
| 0.26 | 5.07 | 5.3 | 0.9 | 0.12 | 688.40 |

These emission factors are in compliance with the Subpart IIII emission limits as well as the emissions limits established in the ROP.

During my inspection, I also recorded the following information:

| Engine ID | Serial # | Install Date | Hours on Engine |
|-----------------------|----------|--------------|-----------------|
| EU-ELECGEN1R (New #1) | SFJ00561 | 6/26/2015 | 113.6 |
| EU-ELECGEN2R (New #3) | SFJ00560 | 1/15/2016 | 26.1 |

Sterilizers

The previous ethylene oxide sterilizers at Beaumont used a sterilant blend that was phased out in the United States. In 2013, Beaumont replaced these units with four new units (two Model 8XL and two Model 5XL); the sterilant is now in individual one time use canisters. The 8XL Models use 0.37lbs/load and the 5 XL models use 0.22 lbs/load. The conditions of PTI No. 205-02C were incorporated in ROP No. MI-ROP-G5067-2014 under the flexible Group: FG-ETOSTERILIZERS. The Sterilizers are subject to the National Emission Standards for Hazardous Air Pollutants for Hospital Ethylene Oxide Sterilizers, 40 CFR, Part 63, Subpart WWWW.

The sterilizers are utilized when sterilizing temperature sensitive surgical tools and other medical equipment. Depending on the temperature of the cycle (55°F or 37°F), each sterilization period last for 2-3 hours. After sterilization, gas is immediately purged from the chamber and then the chamber is aerated for approximately 12 hours to remove any residual ethylene oxide. The exhaust from each sterilizer is vented to an acid scrubber and through a dry chemical bed filter. The ethylene oxide is converted to ethylene glycol after being sent through the sulfuric acid scrubber and is collected in a holding tank at the bottom of the scrubber.

In the application for PTI 205-02C, Beaumont demonstrated that the control system is meeting the 99.5% ethylene oxide destruction efficiency and hourly emission limit established in the PTI. The pH of the acid scrubbing solution in each scrubber is checked monthly to ensure the control is properly working. The pH must be less than 3; based on the records the pH was never above 1 in any scrubber for 2015. Mr. Gibson explained the scrubbing solution is changed approximately every three years; the last replacement occurred on 5/19/15 and one is schedule in the 360 System for 2018 and 2021.

During the inspection, I verified that monthly and weekly preventative maintenance checks are performed on the vacuum pumps, chambers, and emission control equipment. Beaumont is also required to record the daily monthly number of loads for each unit and calculate 12-month rolling emissions of ethylene oxide.

All records for 2015 and 2016 and the Sterilizer Malfunction Abatement Plan (MAP) were available on-site. During my inspection, Mr. Gibson explained that the sterilizer room and ethylene oxide canister storage case are continuously exhausted to an air handler on the roof for worker safety. In the event of an ethylene oxide leak, alarms would activate and emissions would be released through the roof system into the ambient air. This information was listed in the previous MAP, however the canister storage cabinet was not included. Mr. Rusnak updated the Sterilizer MAP and emailed it to the AQD on 3/17/2016 (see attached).

Beaumont staff provided copies of the January and February 2016 monthly sterilizer reports (see attached). These reports include the following for each sterilizer/scrubber: the number of loads per day and month, the monthly scrubber pH, the monthly scrubber solution flows, the monthly scrubber exhaust fan differential pressures. Mr. Gibson noted the flow/pressure meters all have alarms on them and notify staff if any problems are occurring in the system.

Below is a summary of the 2016 records:

| Sterilizer ID | January 2016 # of Loads | Monthly EtO Emissions (lbs) | 12-month Rolling EtO Emissions (lbs) |
|---------------|-------------------------|-----------------------------|--------------------------------------|
| 5a | 17 | 0.0315 | 0.4 |
| 6a | 18 | 0.0333 | 0.36 |
| 7a | 22 | 0.0242 | 0.23 |
| 8a | 12 | 0.0132 | 0.11 |
| Combined | 69 | 0.1022 | 1.09 |

| Sterilizer ID | February 2016 # of Loads | Monthly EtO Emissions (lbs) | 12-month Rolling EtO Emissions (lbs) |
|---------------|--------------------------|-----------------------------|--------------------------------------|
| 5a | 25 | 0.0463 | 0.41 |
| 6a | 23 | 0.0426 | 0.37 |
| 7a | 27 | 0.0297 | 0.24 |
| 8a | 15 | 0.0165 | 0.11 |
| Combined | 90 | 0.1350 | 1.13 |

The records note the following ranges for optimal performance from the scrubbers: pH below 3.0, flow rate range of 3.0 to 3.8 gallons/min, exhaust fan differential pressure range 1 to 3 inches Water Column.

Below is a summary of the 2016 records:

January 2016

| Scrubber ID | Average Scrubber Solution pH | Scrubber Flow Rate Range (gallons/min) | Scrubber Exhaust Fan Differential Pressure Range (inches WC) |
|-------------|------------------------------|--|--|
| #7 | 1 | 3.4 and 3.4 | 2.5" WC |
| #8 | 1 | 3.4 and 3.5 | 2.5" WC |
| #9 | 1 | 3.5 and 3.5 | 2.5" WC |

February 2016

| Scrubber ID | Average Scrubber Solution pH | Scrubber Flow Rate Range (gallons/min) | Scrubber Exhaust Fan Differential Pressure Range (inches WC) |
|-------------|------------------------------|--|--|
| #7 | 1 | 3.3 and 3.4 | 2.4" WC |
| #8 | 1 | 3.4 and 3.5 | 2.2" WC |
| #9 | 1 | 3.5 and 3.5 | 2.3" WC |

At the time of my inspection, I observed the following:

| Emission Unit ID in ROP | Unit ID | Model | Associate Scrubber ID | Scrubber Flow Rate (gallons/min) | Scrubber Exhaust Fan Differential Pressure |
|-------------------------|---------|-------|-----------------------|----------------------------------|--|
| EU-ETOSTERILIZER1 | 5a | 8 XL | #7 | 3.0 and 3.0 | ~2.5" WC |
| EU-ETOSTERILIZER2 | 6a | 8XL | #8 | 3.0 and 3.5 | ~2.5" WC |
| EU-ETOSTERILIZER3 | 7a | 5XL | #9 | 3.5 and 3.5 | ~2.5" WC |
| EU-ETOSTERILIZER4 | 8a | 5XL | #9 | 3.5 and 3.5 | ~2.5" WC |

Based on the data reviewed and on-site observations, Beaumont appears to properly be operating and maintaining the sterilizers and scrubbers. The provided records indicate that Beaumont is in compliance with the recordkeeping, monitoring, and emission limits for the ethylene oxide sterilizers. The sterilizers are in compliance with the lbs/hour limits and the ethylene oxide emission limit of 3.69 lbs/year.

During my inspection, Mr. Mutchler explained that Beaumont's Royal Oak Campus has seen an increase in ethylene oxide sterilization volume/cycles due to items received from Beaumont Troy and other hospitals that are now operated under the Beaumont System (Bostford and Oakwood). I noted an increase from January 2016 to February 2016, and told Beaumont to be mindful of their permit limits if the volume continues to increase.

In addition to the ethylene oxide sterilizers, Beaumont has approximately 50 steam sterilizers (autoclave units) throughout the hospital campus. These units appear to be exempt from obtaining a PTI pursuant to Rule 281(i).

Woodshop and FG-287(c)

Beaumont has a sanding area in the woodshop where particulate emissions are controlled by a "Torit" baghouse located along the outside of the building. The woodworking operations appear to be exempt from obtaining a PTI pursuant Rule 285(l)(vi)(C). During my inspection, I noted that the dust collector appeared to be maintained and did not observe any fugitive dust.

The flexible group FG-287(c) addresses a paint spray booth located in Beaumont's woodshop. At the time of my inspection, Mr. Cosart stated Beaumont is not currently using the paint booth and the room/booth is currently being used as storage space. This is similar to the previous air inspection; as zero paint was used in 2013/2014 as well.

FG-COLDCLEANERS

The hospital operates two cold cleaners. One of the cold cleaners is located in the West Powerhouse and the other is located in the garage. The cold cleaner in the West Powerhouse uses "Armakleen MPC Cleaning Solution" which is an aqueous alkaline cleaning solution consisting of mainly sodium carbonate and water. The cold cleaner in the garage uses recycled "Safety-Kleen 105" cleaning solvent. "Safety-Kleen" is composed of 99-100% by weight mineral spirits. Proper cold cleaning procedures were posted above this cold cleaner and the lid was closed. Mr. Lewis explained the cold cleaner in the garage is rarely used. The MSDS sheets for both cleaners have not changed and are available in the AQD file.

Miscellaneous Equipment

At the time of my inspection, Beaumont staff stated no new emergency generators are planned for the near future; I reminded them that they would have to apply for any new permits prior to installing new equipment (or provide an exemption demonstration).

In the garage, hand welders are occasionally used; these activities appear to be exempt from obtaining a PTI pursuant Rule 285(i).

This campus also has multiple heating units that appear to be exempt from a obtaining a PTI pursuant to Rule 282(b)(i). Beaumont currently lists the following units under this exemption: Research Boilers 1, 2, 9, 10, and 11, Eight Lochinvar hot water heating boilers, and two domestic hot water heating boilers.

As mentioned earlier, Beaumont has multiple above and below ground fuel storage tanks; these appear to be exempt from a obtaining a PTI pursuant to Rule 284(d) and Rule 284(g)(i) and do not appear to be subject to 40 CFR, Part 60, Subpart Kb. The two 2,000 gallon gasoline storage tanks dispense gasoline to a variety of vehicles at Beaumont. In 2015, Beaumont Dispensed 97,582 gallons of gasoline; monthly usage ranged from 7,432 gallons to 8,743 gallons (see attached records). Based on this information Beaumont is subject to the NESHAP for Gasoline Dispensing Facilities, 40 CFR, Part 63, Subpart CCCCCC.

Section 63.11116 lists the following requirements for facilities with monthly throughput of less than 10,000 gallons of gasoline:

(a) You must not allow gasoline to be handled in a manner that would result in vapor releases to the atmosphere for extended periods of time. Measures to be taken include, but are not limited to, the following:

- (1) Minimize gasoline spills;
- (2) Clean up spills as expeditiously as practicable;
- (3) Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use;
- (4) Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices, such as oil/water separators.

(b) You are not required to submit notifications or reports as specified in §63.11125, §63.11126, or subpart A of this part, but you must have records available within 24 hours of a request by the Administrator to document your gasoline throughput.

(c) You must comply with the requirements of this subpart by the applicable dates specified in §63.11113.

(d) Portable gasoline containers that meet the requirements of 40 CFR part 59, subpart F, are considered acceptable for compliance with paragraph (a)(3) of this section.

Based on the records provided and my observations during the inspection, Beaumont appears to be in compliance with Subpart CCCCC.

Michigan Air Emission Reporting System (MAERS)

For 2014 and 2015, Beaumont reported the following emissions:

| 2014 | | 2015 | |
|-----------------|------------|-----------------|------------|
| Pollutant | Amount | Pollutant | Amount |
| NOx | 32.73 Tons | NOx | 30.91 Tons |
| CO | 24.16 Tons | CO | 22.09 Tons |
| VOC | 1.55 Tons | VOC | 1.57 Tons |
| PM 10, Primary | 2.12 Tons | PM 10, Primary | 1.90 Tons |
| PM 2.5, Primary | 2.12 Tons | PM 2.5, Primary | 1.90 Tons |
| SO2 | 892.31 lbs | SO2 | 871.32 lbs |
| Ammonia | 266.82 lbs | Ammonia | 240.14 lbs |
| Lead | 0.27 lbs | Lead | 0.25 lbs |

The reported emissions appear to be consistent with the records reviewed during my inspection.

Federal Regulations

Equipment located at Beaumont is subject to the following Federal Regulations:

- The National Emission Standards for Hazardous Air Pollutants for Hospital Ethylene Oxide Sterilizers, 40 CFR, Part 63, Subpart WWWW
- The National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE), 40 CFR, Part 63, Subpart ZZZZ,
- The Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 CFR, Part 60, Subpart IIII (1R and 2R emergency generators)
- The Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR, Part 60, Subpart Dc.

- The National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources, 40 CFR, Part 63, Subpart JJJJJJ.
- The National Emission Standards for Hazardous Air Pollutants for Gasoline Dispensing Facilities, 40 CFR, Part 63, Subpart CCCCCC.

Each Federal Regulation was assessed during permitting; the ROP has specific conditions which Beaumont uses to demonstrate compliance with these Federal Regulations. In the next ROP renewal, specific conditions will be added for the gasoline dispensing units (Subpart CCCCCC).

Conclusions

Based on information gathered and reviewed, at this time, William Beaumont Hospital - Royal Oak appears to be in compliance with the Federal Clean Air Act, Michigan's Air Pollution Control Rules, and the conditions established in ROP No. MI-ROP-G5067-2014.

NAME Rebecca J. [Signature] DATE 3/28/16 SUPERVISOR CJE

Equipment Lists

As listed in the ROP:

| Emission Unit ID | Emission Unit Description | Installation Date/ Modification Date | Dismantle Date | Location at Hospital | Flexible Group ID |
|----------------------------|--|---|----------------|----------------------|-----------------------------|
| EU-BOILER1 | Keeler Model No. DS-30 boiler. Heat input capacity of 39 MMBtu/hour. Capable of producing 30,000 pounds of steam per hour. Combusts natural gas and fuel oil No. 2. | 1/1/1978 | --- | West Powerhouse | FG-FUELOIL |
| EU-BOILER2 | Cleaver-Brooks Model D-60-RH (D-series) boiler. Heat input capacity of 48.2 MMBtu/hour using natural gas fuel and 46.4 MMBtu/hour using fuel oil No. 2. Capable of producing 40,000 pounds of steam per hour. | 2/1/1998 | --- | West Powerhouse | FG-BOILER2&3, FG-FUELOIL |
| EU-BOILER3 | Cleaver-Brooks Model D-52 (D-series) boiler. Heat input capacity of 48.2 MMBtu/hour using natural gas fuel and 46.4 MMBtu/hour using fuel oil No. 2. Capable of producing 40,000 pounds of steam per hour. | 6/26/2002 | --- | West Powerhouse | FG-BOILER2&3, FG-FUELOIL |
| EU-BOILER4 | Erie City boiler. Heat input capacity of 48 MMBtu/hour and capable of producing 40,000 pounds of steam per hour. Combusts natural gas and fuel oil No. 2. | 01/01/1973, 9/9/1998 | --- | West Powerhouse | FG-BOILER4&5, FG-FUELOIL |
| EU-BOILER5 | Keeler Model No. DS-40 boiler. Heat input capacity of 48 MMBtu/hour and capable of producing 40,000 pounds of steam per hours. Combusts natural gas and fuel oil No. 2. | 01/01/1973, 9/9/1998 | --- | West Powerhouse | FG-BOILER4&5, FG-FUELOIL |
| EU-COGEN1 (Engine A) | Fairbanks Morse cogeneration engine. Heat input capacity of 17.0 MMBtu/hour. Capable of producing 1928 kilowatts of electricity. Combusts either dual fuel (95% natural gas/5% fuel oil No. 2) or fuel oil No. 2. Associated heat recovery boiler is capable of producing 2,000 pounds of steam per hour. Heat recovery boiler has no supplemental burner. | 6/1/1992 | --- | West Powerhouse | FG-FUELOIL, FG-EMERGENCY |
| EU-COGEN2 (Engine B) | Fairbanks Morse cogeneration engine. Heat input capacity of 17.0 MMBtu/hour. Capable of producing 1928 kilowatts of electricity. Combusts either dual fuel (95% natural gas/5% fuel oil No. 2) or fuel oil No. 2. Associated heat recovery boiler is capable of producing 2,000 pounds of steam per hour. Heat recovery boiler has no supplemental burner. | 6/1/1992 | --- | West Powerhouse | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN3 | Detroit Diesel Model No. 16V-149 internal combustion engine electrical generator. Capable of producing 900 kilowatts of electricity. Combusts fuel oil No. 2. | 1/1/1973 | 7/31/2014 | --- | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN4 | Detroit Diesel Model No. 16V-92 internal combustion engine electrical generator. Capable of producing 750 kilowatts of electricity. Combusts fuel oil No. 2. | 1/1/1985 | 8/31/2015 | --- | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN5 | Detroit Diesel internal combustion engine electrical generator. Heat input capacity of 12.5 MMBtu/hour and capable of producing 1,300 kilowatts of electricity. Combusts fuel oil No. 2. | 7/31/1993 | 8/31/2015 | --- | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN6 | Caterpillar Model 3512 internal combustion engine electrical generator. Heat input capacity of 10.0 MMBtu/hour and capable of producing 1,300 kilowatts of electricity. Combusts fuel oil No. 2. | 2/1/1998 | --- | West Powerhouse | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN7 | Caterpillar Model 3512 internal combustion engine electrical generator. Heat input capacity of 10.0 MMBtu/hour and capable of producing 1,300 kilowatts of electricity. Combusts fuel oil No. 2. | 2/1/1998 | --- | West Powerhouse | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN8 (East #1) | Caterpillar Model 3516B internal combustion engine electrical generator. Heat input capacity of 17.0 MMBtu/hour. Capable of producing 2,000 kilowatts of electricity. Combusts fuel oil No. 2. | 7/31/2002 | --- | East Powerhouse | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN9 (East #2) | Caterpillar Model 3516B internal combustion engine electrical generator. Heat input capacity of 17.0 MMBtu/hour. Capable of producing 2,000 kilowatts of electricity. Combusts fuel oil No. 2. | 7/31/2002 | --- | East Powerhouse | FG-FUELOIL, FG-EMERGENCY |
| EU-RESGEN1 (Gen Lab #1) | Caterpillar Model 3508B internal combustion engine electrical generator. Heat input capacity of 6.7 MMBtu/hour. Capable of producing 900 kilowatts of electricity. Combusts fuel oil No. 2. | 1/1/1999 | --- | Research Building | FG-FUELOIL, FG-EMERGENCY |
| EU-RESGEN2 (Gen Lab #2) | Caterpillar Model 3508B internal combustion engine electrical generator. Heat input capacity of 6.7 MMBtu/hour. Capable of producing 900 kilowatts of electricity. Combusts fuel oil No. 2. | 1/1/1999 | --- | Research Building | FG-FUELOIL, FG-EMERGENCY |
| EU-ELECGEN1R (New #1) | Caterpillar Model 3516C internal combustion engine electrical generator. Heat input capacity of 19.0 MMBtu/hour. Capable of producing 2,000 kilowatts of electricity. Combusts fuel oil No. 2. Manufactured in 2014. Certified Engine; engine family: ECPXL78.1NZS Serial #: SFJ00561 | 6/26/2015 | --- | West Powerhouse | FG- ELECGEN1&2R |
| EU-ELECGEN2R (New #3) | Caterpillar Model 3516C internal combustion engine electrical generator. Heat input capacity of 19.0 MMBtu/hour. Capable of producing 2,000 kilowatts of electricity. Combusts fuel oil No. 2. Manufactured in 2014. Certified Engine; engine family: ECPXL78.1NZS Serial #: SFJ00560 | 1/15/2016 | --- | West Powerhouse | FG- ELECGEN1&2R |

| Emission Unit ID | Emission Unit Description | Installation Date/ Modification Date | Dismantle Date | Location at Hospital | Flexible Group ID |
|-------------------|--|---|----------------|--|-------------------|
| EU-ETOSTERILIZER1 | One 3M Steri-Vac 8XL Gas Sterilizer, 100% ethylene oxide (EtO) sterilizer. The sterilizer is controlled by one of three Advanced Air Technologies (AAT) Safe-Cell System Model 2002 acid scrubbers and dry bed chemical filters. | 7/18/2013, 2/26/14 | --- | Lower Level North Tower, CPD Processing Area | FG-ETOSTERILIZERS |
| EU-ETOSTERILIZER2 | One 3M Steri-Vac 8XL Gas Sterilizer, 100% ethylene oxide (EtO) sterilizer. The sterilizer is controlled by one of three Advanced Air Technologies (AAT) Safe-Cell System Model 2002 acid scrubbers and dry bed chemical filters. | 7/18/2013, 2/26/14 | --- | Lower Level North Tower, CPD Processing Area | FG-ETOSTERILIZERS |
| EU-ETOSTERILIZER3 | One 3M Steri-Vac 5XL Gas Sterilizer, 100% ethylene oxide (EtO) sterilizer. The sterilizer is controlled by one of three Advanced Air Technologies (AAT) Safe-Cell System Model 2002 acid scrubbers and dry bed chemical filters. | 7/18/2013, 2/26/14 | --- | Lower Level North Tower, CPD Processing Area | FG-ETOSTERILIZERS |
| EU-ETOSTERILIZER4 | One 3M Steri-Vac 5XL Gas Sterilizer, 100% ethylene oxide (EtO) sterilizer. The sterilizer is controlled by one of three Advanced Air Technologies (AAT) Safe-Cell System Model 2002 acid scrubbers and dry bed chemical filters. | 7/18/2013, 2/26/14 | --- | Lower Level North Tower, CPD Processing Area | FG-ETOSTERILIZERS |
| EU-WOODSHOP | Woodworking shop used on a nonproduction basis, controlled by a dust collector; shop includes a paint spray booth. | 10/11/1986 | --- | Wood Shop, West Side of Campus | FG-RULE287c |
| EU-CCGARAGE | Cold cleaner located in the garage. | 5/1/2004 | --- | Garage, West Side of Campus | FG-COLDCLEANERS |

As Listed in the ROP Application

| Exempt Emission Unit ID | Description of Exempt Emission Unit | Rule 212(4) Exemption | Rule 201 Exemption |
|-------------------------|---|-----------------------|--------------------|
| EU-XYLENEREC | Batch xylene recycling unit with a capacity of less than 55 gallons | Rule 212(4)(d) | Rule 285(u) |
| EU-RESBOILER1 | 6.3 MMBtu/hr Cleaver Brooks boiler located in the research building | Rule 212(4)(b) | Rule 282(b)(i) |
| EU-RESBOILER2 | 6.3 MMBtu/hr Cleaver Brooks boiler located in the research building | Rule 212(4)(b) | Rule 282(b)(i) |
| EU-RESBOILER9 | 3.3 MMBtu/hr Kewanee boiler located in the research building | Rule 212(4)(b) | Rule 282(b)(i) |
| EU-RESBOILER10 | 3.3 MMBtu/hr Kewanee boiler located in the research building | Rule 212(4)(b) | Rule 282(b)(i) |
| EU-RESBOILER11 | 0.7 MMBtu/hr Bryan boiler located in the research building | Rule 212(4)(b) | Rule 282(b)(i) |
| EU-RESBOILERHH | Eight identical Lochinvar domestic hot water boilers, B1-B8, 2.1 MMBtu/hr | Rule 212(4)(b) | Rule 282(b)(i) |
| EU-RESBOILERDH | Two identical Lochinvar domestic hot water boilers, 0.3 MMBtu/hr each | Rule 212(4)(b) | Rule 282(b)(i) |

All of these emission units have heat inputs of less than 10 MMBtu/hr; therefore they are not subject to 40 CFR, Part 60, Subpart Dc.

Under Ground Storage Tanks:

| Tank # | Capacity | Fuel | Location/Use | Exemptions/Applicable Regulations |
|--------|----------|----------|--|---|
| 5 | 2,000 | gasoline | Fuel Beaumont Vehicles/Equipment | 284(g)(i), Subject to 40 CFR Part 63 Subpart CCCCC, NESHAP for Gasoline Dispensing Facilities, Not subject to 40 CFR Part 60 Subpart Kb |
| 6 | 2,000 | gasoline | Tank #6 use to be diesel but was converted to gasoline | 284(g)(i), Subject to 40 CFR Part 63 Subpart CCCCC, NESHAP for Gasoline Dispensing Facilities, Not subject to 40 CFR Part 60 Subpart Kb |
| 9 | 6,000 | diesel | R&D Building Generators | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |
| 10 | 20,000 | diesel | West power house; fuel for boilers. | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |
| 11 | 20,000 | diesel | West power house; fuel for generators | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |
| 13 | 40,000 | diesel | East power house; fuel for generators | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |
| 14 | 40,000 | diesel | West power house; fuel for generators | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |
| 15 | 40,000 | diesel | West power house; fuel for generators | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |
| 16 | 40,000 | diesel | West power house; fuel for generators | 284(d), Not subject to 40 CFR Part 60 Subpart Kb |