

J5461  
MAW12A

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

J546146021

FACILITY: ST MARY HOSPITAL		SRN / ID: J5461
LOCATION: 36475 FIVE MILE RD, LIVONIA		DISTRICT: Detroit
CITY: LIVONIA		COUNTY: WAYNE
CONTACT: David Timm , Director of Facilities and Grounds		ACTIVITY DATE: 08/15/2018
STAFF: Stephen Weis	COMPLIANCE STATUS: Compliance	SOURCE CLASS: Minor
SUBJECT: Compliance inspection of the St. Mary Mercy Hospital in Livonia. The hospital facility is scheduled for inspection in FY 2018.		
RESOLVED COMPLAINTS:		

**Location:**

St. Mary Mercy Livonia Hospital  
(SRN J5461)  
36475 Five Mile Road  
Livonia 48154

**Date of Activity:**

Wednesday, August 15, 2018

**Personnel Present:**

Steve Weis, DEQ-AQD Detroit Office  
David Timm, Director of Facilities and Grounds, St. Mary Mercy Livonia Hospital

**Purpose of Activity**

A self-initiated inspection of the St. Mary Mercy Livonia Hospital facility (hereinafter "St. Mary") in Livonia was performed on Wednesday, August 15, 2018. The St. Mary facility was on my list of sources targeted for an inspection during FY 2018. The purpose of this inspection was to determine compliance of operations at the St. Mary facility with applicable rules, regulations and standards as promulgated by Public Act 451 of 1994 (NREPA, Part 55 Air Pollution Control), and with applicable Federal standards. The facility is not currently subject to any DEQ-AQD permits.

**Facility Site Description**

The St. Mary facility is a hospital and its related building and operations support facilities that is located on the south side of Five Mile Road, west of Levan Road. The facility is located on the Felician Sisters of North America property, which is 320 acres in area and is bounded by Five Mile Road to the north, Levan Road to the east, Schoolcraft Road to the south and Newburgh Road to the west. There are several institutions/operations located on the Felician Sisters' property – Madonna University at the southeast end of the property; Angela Hospice at the southwest end; Montessori Center of Our Lady on the west end along Newburgh Road; the former Ladywood High School along Newburgh Road; athletic fields for Madonna University in the northwest corner of the property; Marywood Rehabilitation and Nursing Center along Five Mile; housing for retired clergy at the east end of the property off of Levan; and the Felician Sisters convent located in the center of the property.

The St. Mary facility is located in the northeast quadrant of the Felician Sisters property; the facility occupies 42.5 acres, and the total building area is currently 1,003,045 gross square feet (this includes all of the floors of the buildings). A print out of a map of the St. Mary facility is attached to this report for reference. The area around the St. Mary facility is a mix of residential, institutional and clinical medical operations, and commercial properties. There is a dental practice and a medical office building to the northwest of the intersection of Five Mile and Levan Roads. On the east side of Levan, there is a single-story medical office building located directly across from St. Mary's, and a veterinary practice, a pharmacy, another medical building and a gas station to the north up to Five Mile. The Marywood Rehabilitation and Nursing Center is located directly to the west of St. Mary. There are residential neighborhoods extending to the north of Five Mile, east of Levan, and to the northeast from the intersection of Five Mile and Levan Roads. The closest residences are located approximately

100 yards to the east of St. Mary on the east side of Levan Road.

### **Facility Operations**

St. Mary Hospital was founded and opened in 1959 by the Felician Sisters. The Felician Sisters of North America own the property and the hospital buildings, but the administration and operations of the hospital are under the control of Trinity Health. According to the facility's website ([www.stmarymercy.org/livonia](http://www.stmarymercy.org/livonia)), this arrangement began in 1999, when the Sisters of Mercy acquired the business operations of the St. Mary facility. In 2000, Sisters of Mercy and the Congregation of the Holy Cross consolidated their respective health ministries and formed a new health system called Trinity Health. That same year, Trinity Health acquired the business operations of the hospital, which was renamed as St. Mary Mercy Hospital. I was told during my site visit that the St. Mary facility is operated independent from the other entities located on the Felician Sisters' property.

The St. Mary facility operates as a hospital and medical center, and there are related building and operations support activities. The website describes the St. Mary facility as follows:

*"St. Mary Mercy Livonia is a full service 304 bed acute care hospital that provides comprehensive care, including a 24-hour emergency department, general medicine, inpatient and outpatient surgery, physical medicine and rehabilitation, intensive care unit, cancer, cardiology, geriatrics, and birthing and women's services."*

The St. Mary Hospital facility currently operates three boilers (natural gas-fired with diesel fuel backup) and 5 diesel-fired generators on site to provide for the heating, steam, and back-up electrical power needs of the facility. It is presumed that, as is the case with other hospitals, the St. Mary facility is required by governing bodies that oversee hospitals to have backup fuel and power sources to assure that hospital operations are not interrupted; thus, the diesel fuel backup for the boilers, and the need to have generators on-site to provide back-up electrical power.

The boilers are identified by the facility as Boiler #1, 2 and 3. Boiler #'s 1 and 2 were installed when the facility was constructed and opened in 1959. Both of these boilers are identical Titusville Iron Works boilers having a maximum rated heat input capacity of 25.2 MMBTU per hour. Boiler #3 is a Cleaver Brooks unit that has a maximum rated heat input capacity of 16.738 MMBTU per hour, and it was installed in 1970. Copies of examples of Certificates of Boiler Inspection forms that show the manufacturer, maximum operating pressure and the year built for each of the boilers, and that are affixed with a note providing the maximum rated heat input capacity for the boilers, are attached to this report.

The five diesel-fired generators are all Caterpillar units that were installed at various times. The generators are identified by the facility as Generator #1, 2, 4, 5 and 6. The specifics for the generators are as follows:

- Generator #'s 1 and 2 are Caterpillar Model SR4 units with model 3412 engines. The generators are both rated at 600 kW, and they were installed in 1987.
- Generator #4 is a Caterpillar Model SR4B unit with a model 3508 engine. The generator is rated at 900 kW, and it was installed in 1996.
- Generator #5 is a Caterpillar Model SR4B unit with a model 3412 engine. The generator is rated at 800 kW, and it was installed in 2006.
- Generator #6 is a Caterpillar Model SR5 unit with a model C32 engine. The generator is rated at 1,000 kW, and it was installed in 2011.

Copies of the Caterpillar specification sheets for the generator engines, as well as copies of the most recent load bank tests for each generator, are attached to this report for reference.

The facility operates small steam sterilizers in the surgical area of the hospital that uses steam provide by the facility's boilers. The facility does not have any ethylene oxide sterilizers.

The facility operates 24 hours per day, 7 days per week.

### **Inspection Narrative**

I first attempted to perform a site visit on July 27, 2018., arriving at the facility at 3:00pm. After checking in at the front desk, I was directed to the lower level, where I was told that the person that I would need to meet with, David Timm, was not in the office. I left my contact information, and David and I spoke via a telephone call and arranged for me to visit the facility on August 15.

On August 15, I arrived at the facility at 2:10pm. I was met by David at the hospital's Five Mile Road entrance, and we proceeded to his office. The first topic of our discussion was an overview of the facility. David told me that St. Mary Hospital was opened in 1959 by the Felician Sisters, and that the facility is now part of Trinity Health/St. Joseph Mercy. I asked about the relation of the facility to other entities operating on the Felician Sisters' property. He replied that all of the business and operational decisions regarding St. Mary are made by Trinity, and that the St. Mary facility operates independently of the Felician Sisters and the other entities on the property.

David told me that the St. Mary facility occupies 42.5 acres, and that there is currently 1,003,045 gross square feet of building space.

We then discussed the facility operations, specifically the operations that emit to the ambient air. David described the three boilers and the five generators. He told me that the boilers are natural gas-fired, with fuel oil backup. I was told that the back-up fuel is required to ensure that the hospital is able to operate in case the supply of the primary fuel is interrupted. David provided me with the previously-referenced boiler inspection information which listed the boiler manufacturer and the year that the boilers were built. I asked if the maximum rated heat input capacities of the boilers could be obtained from the boiler plates. One of David's co-workers went to the boilers and read the information from the boilerplates, writing it on the post-it notes that are attached to the boiler inspection sheets.

David told me that the generators are checked monthly, and that a "spin" test at load is performed every month to ensure that the units are maintained and ready to operate, if needed. I was provided with example Load Bank Test reports that were performed on each of the generators my Michigan Caterpillar.

I asked David about other potential sources of ambient air emissions. I asked whether the facility utilized sterilizers for medical equipment. David told me that there are some small steam sterilizers in the surgical area of the hospital, the steam for which is provided by the facility's boilers. He confirmed that the facility does not have any ethylene oxide sterilizers. David told me that there are no cold cleaners in use at the facility. I asked whether there were any fuel distribution operations at the facility, and he responded that there are no such operations or equipment.

I then discussed a list of equipment at the facility that had received permits from the Wayne County Air Quality Management Division (WCAQMD). I found records in the facility file of six separate permit activities from several years ago (these permit activities will be discussed in more detail in the next section of this report). The equipment addressed by these permit activities ranges from the Cleaver Brooks boiler, which is still in operation, the various incinerators and a couple of paint booths. David confirmed that all of the equipment addressed by these permit activities, with the exception of the boiler, are not in operation, and have been physically removed from the facility many years ago. He told me that there is no incineration of waste (from pathological to typical refuse) at the facility. Medical and pathological waste is sent offsite for disposal.

I provided David with copies of DEQ-AQD's Permit to Install Exemption Handbook, and DEQ-AQD's natural gas fired boiler NSPS guidance. After a brief summary conversation of the site visit, I left the facility at 3:20pm.

### **Permits/Regulations/Orders/Other**

#### *Boilers*

There are no active DEQ-AQD Permits to Install (PTIs) for the St. Mary facility. There is the WCAQMD permit that was issued for the Cleaver Brooks boiler. The permit, identified as Permit No. C-1966, was applied for on October 29, 1969, and was issued on April 6, 1971. There do not appear to be any permit conditions associated with this permit, which is not unusual for permits that were issued in the early days of the air regulatory agencies (i.e. 1960's and 1970's).

The Cleaver Brooks boiler looks to be exempt from DEQ-AQD permitting requirements. The exemption criteria for this boiler are found in Michigan Administrative Rule 282(b)(ii), which addresses boilers that utilize fuel oil as a back-up fuel. Rule 282(b)(ii) exempts fuel burning equipment that uses No.1 and No.2 oil, distillate oil, natural

gas or a combination of these fuels that does not contain more than 0.4% sulfur by weight, and the equipment has a maximum rated heat input capacity of 20,000,000 BTU/hour. The Cleaver Brooks boiler meets the exemption criteria, having a maximum heat input capacity of less than 20 MMBTU/hour. The facility uses on road ultra-low sulfur fuel, which has a compliant sulfur in fuel limit. The other two boilers at the St. Mary facility, the Titusville Irons Works boilers identified as Boiler #'s 1 and 2, are grandfathered from permitting requirements due to their installation date. David indicated that these two boilers have received regular maintenance, but no significant maintenance performed on them. One of David's co-workers mentioned that the boilers had some upgrades performed on them around 1984 to increase their efficiency, but that to his knowledge, the burners were not changed or modified.

The three boilers are not subject to Subpart Dc as they were all installed prior to June 9, 1989.

I created a document that analyzes the potential regulatory requirements for the boilers and the generators, and that includes an estimate of the potential to emit (PTE) from this equipment. The worst-case PTE that I calculated for the three boilers is 42.8 tpy of NO<sub>x</sub> (assuming 100% fuel oil usage), 23.53 tpy of CO (assuming 100% natural gas usage), 2.78 TPY of PM (assuming 100% fuel oil usage), and 90.4 tpy of SO<sub>2</sub> (assuming 100% fuel oil usage). A copy of the document is attached to this report.

### *Generators*

Regarding the five generators, four of them appear to meet the PTI exemption criteria put forth in Michigan Administrative Rule 285(g), which exempts internal combustion engines that have less than 10,000,000 BTU per hour maximum heat input. The specification sheets for Generator #'s 1 and 2 indicate that each unit's engine has a maximum fuel consumption rate of 42.2 gallons per hour. Pairing the fuel consumption rate with a typical diesel fuel heat value of 138,500 BTU per hour provides a maximum hourly heat input capacity of 5.84 MMBTU per hour for these two generators. Generator #4's specification sheet provides a maximum fuel consumption rate of 73.9 gallons per hour, which equates to a maximum rated heat input capacity of 10.23 MMBTU per hour. Generator #5's specification sheet provides a maximum fuel consumption rate of 58.6 gallons per hour, which equates to a maximum rated heat input capacity of 8.11 MMBTU per hour. Generator #6's specification sheet provides a maximum fuel consumption rate of 71.9 gallons per hour, which equates to a maximum rate heat input capacity of 9.96 MMBTU per hour. Based on this information, Generator #'s 1, 2 and 5 meet the exemption criteria in Rule 285(g). Generator #4 appears to not meet the exemption criteria, due to its maximum rated heat input capacity exceeding 10 MMBTU per hour. Generator #6 has a maximum rated heat input capacity that was calculated just below the exemption criteria threshold. I found the specification sheets for the generator engines through an online search. Based on past experience, it is possible that the engines used in the generators are more efficient than listed on the specification sheet, and thus use less fuel. This information will be checked with St. Mary staff.

Generator #'s 1, 2 and 4 were installed and manufactured well before the 40 CFR Part 60 Subpart IIII applicability criteria dates. Generator #'s 5 and 6 were both installed after the Subpart IIII applicability date of July 11, 2005, and

The same document that was referenced for the boilers that I drafted to analyze the potential regulatory requirements for the boilers and the generators, the potential to emit for the five generators is 37.16 tpy of NO<sub>x</sub>.

The combined potential to emit of NO<sub>x</sub> emissions from all of the combustion equipment that is currently in place and in operation at St. Mary Hospital – 3 boilers and 5 emergency generators – is 79.96 tpy, while the combined potential to emit of SO<sub>2</sub> emissions from all of the combustion equipment is 93.26 tpy. The potential NO<sub>x</sub> and SO<sub>2</sub> emissions are below the 100 tpy major source threshold. The facility is a true minor source of criteria pollutants.

As mentioned in the last section of this report, there are some permits in the St. Mary facility file that were issued by the WCAQMD. The following is a list of the WCAQMD permits for this facility:

- C-1901 addressed the installation of an incinerator. In a letter dated January 20, 1971 from St. Mary, it was stated that the incinerator was to be used to dispose of materials "from pathological to common refuse and trash".
- C-1966 was approved on April 6, 1971 and addressed the Cleaver Brooks boiler.
- C-3056 was approved on August 21, 1973, and it addressed another incinerator.

- C-3846 was approved on July 29, 1977, and it addressed a universal pathological waste incinerator.
- C-3976 was approved in 1977 and addressed a Devilbiss paint booth.

Aside from the boiler, it was confirmed with facility staff that all of the other equipment has ceased operation and has been permanently removed from the facility.

### Compliance Determination

Based upon the results of the site visit and a review of information relating to the process equipment and operations at the facility, the St. Mary Mercy Livonia Hospital facility appears to be **in substantial compliance** with applicable rules and regulations. It is possible that one of the emergency generators in use at the facility is subject to DEQ-AQD permitting requirements. This matter will be followed up on with facility staff. The rest of the process equipment and operations at the facility appear to be exempt from permitting requirements.

Attachments to this report: a map of the St. Mary facility; copies of past Certificate of Boiler Inspection forms for the boilers at the facility; copies of specification sheets for the generator engines, and of recent Load Bank Test forms for each generator; a print out of the regulatory analysis document that I drafted for the facility's combustion equipment.

NAME Steve Jobs

DATE 1/25/19

SUPERVISOR JK