

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

N3422
 FY2016 Insp

N342232935

FACILITY: OAKLAND UNIVERSITY		SRN / ID: N3422
LOCATION: 2200 N SQUIRREL RD, ROCHESTER		DISTRICT: Southeast Michigan
CITY: ROCHESTER		COUNTY: OAKLAND
CONTACT: Cora Hanson, Environmental Health and Life Safety Manager		ACTIVITY DATE: 01/08/2016
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: FY 2016 scheduled Synthetic Minor CMS inspection of Oakland University ("Oakland U" or "Oakland")		
RESOLVED COMPLAINTS:		

N3422 - SAR - 2016 0108

Oakland University (N3422)
 2200 North Squirrel Road
 Rochester Hills, Michigan 48309-4402

Phone: 248-370-4196 for Ms. Hanson
 Phone: 248-370-4196 for Ms. Peterson
 Fax: 248-370-4376

Permit-to-Install (PTI) Nos.: 419-92B (ROP Opt-out) dated July 26, 1996, for four boilers and 110-07 dated August 7, 2007, for two Emergency Diesel Generators. The opt-out permit is not done correctly because it covers only four large boilers (PTE = 84 tpy NOx) but no other process equipment such as small boilers, diesel generators (PTE = 14 tpy NOx), dynamometers, etc. This is corrected by pending PTI revision 419-92B → 419-92C

Pending PTI revision (John Vial): 419-92B (ROP Opt-out) → 419-92C (ROP Opt-out for NOx and CO < 89 tpy). All process equipment, including the boilers (Nos. 1 and 2, each boiler of capacity 100 MM BTU per hour, existing two boilers [Nos. #3 of 34 MM BTU per hour and #4 of 32 MM BTU per hour] are removed to make room for a turbine and a waste heat recovery unit [WHRU] with duct burner), a gas-fired turbine (51.26 MM BTU per hour) for electric power generation together with a turbine waste heat recovery unit (with a duct burner resulting in total heat of 60 MM BTU per hour, the duct burner can act as stand-alone boiler of 15 MM BTU per hour, as well), two dual fuel RICE emergency generators (PTI No. 110-07), are consolidated into this RO synthetic minor or opt-out permit. Installation of the turbine together with the duct burner is continuing as PTI is being reviewed. Waste heat recovery unit is a heat exchanger.

VOIDS: PTI Nos. 419-92A (voided on 07/22/1996) and 419-92 (voided on 02/29/1996)

Consent Order ASB No. 01-1991 executed on February 5, 1991, by Robert P. Miller, AQD Chief. \$19,000.00 settlement for violating work-practice and notification standards of Old NESHAP, 40 CFR, Part 61, Subpart M, for Asbestos.

Oakland's boilers (hot water) may NOT be subject to: Area Source NESHAP / MACT 6J, 40 CFR Part 63, Subpart JJJJJJ / 6J National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers, Page 15554, Federal Register / Vol. 76, No. 54 / Monday, March 21, 2011 / Rules and Regulations / Final rule. This rule does NOT apply to boilers that burn only gaseous fuels or any solid waste. AQD has decided not to take delegation of these standards and therefore no attempt has been made to evaluate the applicability of NESHAP / MACT 6J. A gas-fired boiler that periodically fires liquid fuels during gas curtailment and supply emergencies or for periodic (not to exceed a total of 48 hours during any calendar year) testing is still considered a gas-fired boiler.

Oakland was subject to 40 CFR Part 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters (Federal Register / Vol. 69,

No. 176 / Monday, September 13, 2004 / Page 55218 / Rules and Regulations). However, on June 8, 2007, US Court of Appeals had mandated that EPA vacate the Boiler MACT Rule in its entirety; in the interim period, 112(j) MACT permit was required. US EPA re-promulgated the Area Source Boiler MACT as NESHAP / MACT 6J

Boilers are NOT subject to: New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units (40 CFR, Part 60, Subpart Db or Dc [NSPS Db or Dc]) based upon installation dates (installed before June 19, 1984, with respect to boilers \geq 100 million BTU per hour heat input and June 9, 1989, with respect to boilers (Small Boilers) \geq 10 million BTU per hour heat input).

Oakland's two (2) emergency generators are NOT subject to: NSPS IIII or 4I, New Source Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 39154 Federal Register / Vol. 71, No. 132 / Tuesday, July 11, 2006 / Rules and Regulations / Final Rule. Two generators are not subject to NSPS 4I based upon manufacture date (before April 1, 2006) and PTI review.

Oakland's two (2) emergency generators may be subject to: RICE MACT 4Z, Area Source NESHAP / MACT ZZZZ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines / Final rule (Page 3568, Federal Register / Vol. 73, No. 13 / Friday, January 18, 2008 / Rules and Regulations / Final rule). US EPA revised RICE MACT several times (75 FR 9648 [03/03/10], 75 FR 51570 [08/20/10], 76 FR 12863 [03/09/11], 76 FR 37954 [06/28/11], 78 FR 6674 [01/30/13], 80 FR 68808 [11/06/15 - Proposed Amendment]. AQD has decided not to take delegation of these standards and therefore no attempt has been made to evaluate Oakland's compliance with NESHAP / RICE MACT 4Z.

Not Subject to: NESHAP/ MACT T, area source National Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning (40 CFR, Part 63, Subpart T; NESHAP/ MACT T); Correction; 29484 Federal Register / Vol. 60, No. 107 / Monday, June 5, 1995 / Rules and Regulations; amended National Air Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning (40 CFR, Part 63, Subpart T); Final Rule; Page 25138 Federal Register / Vol. 72, No. 85 / Thursday, May 3, 2007 / Rules and Regulations. Oakland does NOT use halogenated solvents in cold-cleaners.

GHG: Although AQD does not regulate Green House Gases (GHG), it issues opt-out permits for Title V (ROP) or US EPA GHG reporting requirements. US EPA is regulating GHG via PSD program using a rule known as "tailoring rule". If GHG (e.g.CO₂) > 100 tpy and CO_{2e} >100,000 tpy (both conditions must be met) based upon potential-to-emit (PTE), then the facility in question is subject to ROP / Title V permit. The deadline (July 1, 2012) to either obtain a ROP opt-out permit or ROP has passed based upon FY 2013 inspection.

On October 28, 2015, and January 8, 2016, I conducted a level-2 **scheduled Synthetic Minor CMS** inspection of Oakland University ("Oakland U" or "Oakland") located at 2200 North Squirrel Road, Rochester Hills, Michigan 48309-4402. The inspection was conducted to determine compliance with federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) rules; and the permit conditions.

During the inspection, Ms. Cora Hanson (Phone: 248-370-4196; Fax: 248-370-4376; E-mail: chanson@oakland.edu), Environmental Health and Life Safety Manager, Mr. Dan Maxson (Phone: 248-370-4558; Cell: 248-917-2359; E-mail: maxson@oakland.edu), Heating Plant Supervisor, and Ms. Lisa Peterson (Phone: 248-370-4196), Office Asst., assisted me.

Mr. Adam Jankowski (Phone: 248-370-2384; Cell: 586-945-4341; E-mail: ajankowski@oakland.edu), Stationary Engineer, was not present as his shift started at 4:00 pm.

About 2014, Ms. Peterson replaced Ms. Lisa Hock (Phone: 248-370-4196), Office Asst., who transferred to other Dept. of Oakland U.

About 2013, Mr. Rafi Bayrakdarian (Phone: 248-370-4990; E-mail: bayrakda@oakland.edu), Energy Manager, replaced Mr. James Leidel (Phone: 248-370-4990; Cell: 248-765-2027), Energy Manager, as he transferred to a different position at Oakland. Mr. Grover C. Tigre III (248-370-2388) retired about 2010.

Oakland University ("Oakland") is a higher educational institute and is one of the state universities in Michigan. Oakland has student population of 20,519 (fall 2014). Most students are from Southeast Michigan (Oakland = 44.7%, Macomb = 30.8%, Wayne = 6.2%). Oakland offers 135 bachelors and 135 graduate degrees). Oakland with Beaumont admitted medical students beginning in 2011.

Oakland has four natural gas fired boilers (no fuel oil back-up) for comfort air space heating and two Diesel / Bio-diesel / natural gas emergency generators to handle power supply interruptions. In addition, small boilers, dynamometers, cold-cleaners, etc., which are not part of any permit, are also present. Of four boilers permitted, two smaller boilers are replaced with a turbine with a waste heat recovery unit.

At this time (Jan 2016), Boiler Nos. 3 (34 MM BTU per hour) and 4 (32 MM BTU per hour) are being replaced by one gas-fired turbine (occupying Boiler No. 4 space) for electric power generation and a waste heat recovery unit with a duct burner (occupying Boiler No. 3 space). Permit revision application is being reviewed by AQD (John Vial). Boiler Nos. 1 and 2 (each 100 MM BTU per hour) will continue to operate as usual generating hot water for space heating.

All equipment such as boilers, turbine with WHRU, etc. generate hot water for space heating and not steam.

Permit-to-Install (PTI) No. 419-92B (ROP Opt-out) for four natural gas fired boilers.

This ROP opt-out permit covers only four large natural-gas-fired boilers (two 100 MM BTU / Hour and one 34 MM BTU / Hour and one 32 MM BTU / Hour) and has no FG-Facility limits.

Two identical natural gas fired boilers (Generator #1, International Boiler Works Model TJW-C-10,000 HTW Generator. Serial # M-3256; and Generator #2, International Boiler Works Model TJW-C-10,000 HTW Generator. Serial # M-3337) of design capacity 100 million BTU per hour were installed in CY 1969 and 1971. Two additional natural gas fired boilers (Combustion Engineering) of design capacity 32 (Generator #4, Peabody "PK" Natural Gas Burner. State ID # 79278) & 34 (Generator #3, Peabody "PK" Natural Gas Burner. State ID # 79852) million BTU per hour were installed in 1966 and 1961. Fuel oil capability does not exist and, therefore, has not been used (PTI No. 419-92B, SC13 limit: only natural gas). As stated before, Boiler Nos. 3 and 4 are replaced with a turbine and a waste heat recovery unit.

During the FY 2016 inspection, Boiler Nos. 3 and 4 were physically removed to make room for a turbine and a waste heat recovery unit (heat exchanger with a duct burner (3 direct-fired burners).

Based upon installation dates the boilers are not subject to: New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units (40 CFR, Part 60, Subpart Db [after June 19, 1984, >= 100 million BTU per hour heat input] or 40 CFR, Part 60, Subpart Dc [June 9, 1989, Small Boiler, >= 10 million BTU per hour heat input]). If fuel change, such as spent restaurant fryer oil, occurs the boilers will be subject to either NSPS Db [100 <= Boiler <= 250 million BTU per hour heat input] or Dc [10 <= Small Boiler <= 100 million BTU per hour heat input] depending upon design capacity.

Oakland U obtained ROP Opt-out PTI No. 419-92B to limit NOx emissions to 84 tons per year. The limit applies only to four large natural gas boilers and not any other process equipment including the diesel generators. The NOx limit is equivalent to limiting natural gas usage to 1,200 million standard cubic feet per year, based upon 12-month rolling period. Natural gas usage records are kept. Based upon usage records, Oakland U used less than 260 million standard cubic feet per year (PTI No. 419-92B, SC14 limit: 1,200).

1. 253 MM SCF per 12-mo for July 2011
2. 245 MM SCF per 12-mo for December 2014

3. 232 MM SCF per 12-mo for November 2015

Permit-to-Install (PTI) No. 110-07 for two dual fuel emergency back-up generators.

Each one of two generators produces 1500 kilowatts (kW) or 1.5 megawatts (MW) on a continuous basis and 1600 KW on a standby basis. Each generator is equipped with Mitsubishi S16R-PTA Internal Combustion Engine. Each engine is equipped with a dual fuel control system to allow blending of natural gas and Diesel; Bio-diesel may also be used. The generators are expected to operate less than 500 hours per year (PTI No. 110-07, SC1.3 limit: 1,000 hours / year).

The generators are limited to 14 tons per year of NOx based upon emissions factor (PTI No. 110-07, SC1.1a: 7.8 grams / kW-Hour) and 1,000 hours / Year. Hence, four boilers and two generators limit is 98 tpy NOx; facility-wide emissions when other process equipment are included exceed ROP threshold of 100 tpy. It may be noted that ROP opt-out permit is being revised (John Vial) to include all process equipment.

The generators are installed and fully commissioned. The diesel generators are as follows:

1. Engine1: Mitsubishi S16R-PTA; 1.5 MW; Serial No. 11121; equipped with dual-fuel (natural gas and diesel) control system; January 6, 2016, non-resettable hour meter reading: **652** hours.
2. Engine2: Mitsubishi S16R-PTA; 1.5 MW; Serial No. 11123; equipped with dual-fuel (natural gas and diesel) control system; January 6, 2016, non-resettable hour meter reading: **1,398** hours.

Only Ultra-low Sulfur Diesel (ULSD 15 ppm Sulfur diesel) is used based upon purchase records (PTI No. 110-07, SC 1.4 limit: 0.05% S or 500 ppm S). The generators are operated about 216 (Gen1: 112 gallons Diesel & 118 SCF NG) and 391 (Gen2: 516 gallons Diesel & 122 SCF NG) minutes during CY 2015 (PTI No. 110-07, SC 1.3 limit: 1,000 hrs. / yr.)

Oakland maintains fuel usage, sulfur content (off-road ULSD), hours of operation records (PTI No. 110-07, SC 1.5)

Two 2,000-gallon diesel tanks are present to serve the generators. The generators were purchased used and are not subject to NSPS 4I based upon installation dates and PTI review (PTI No. 110-07).

The dual fuel (NG & ULSD) RICE generators (2) are fired for testing once in a year. The generators hardly used for emergency electricity due to power interruption.

Pending Permit-to-Install (PTI) No. 419-92C

Pending ROP Synthetic Minor PTI revision (John Vial) (419-92B → 419-92C for NOx and CO < 89 tpy) incorporates all process equipment, including boilers (Nos. 1 and 2, each boiler of capacity 100 MM BTU per hour, existing two boilers [Nos. #3 of 34 MM BTU per hour and #4 of 32 MM BTU per hour] are removed to make room for the turbine with duct burner), gas-fired turbine (51.26 MM BTU per hour) for electric power generation together with turbine waste heat recovery unit (with a duct burner resulting in total heat of 60 MM BTU per hour, the duct burner can act as stand-alone boiler of 15 MM BTU per hour, as well), two dual fuel RICE emergency generators (PTI No. 110-07), are consolidated into this RO opt-out permit. Installation of a turbine together with WHRU with a duct burner is continuing as PTI is being reviewed.

At this time (Jan 2016), Boiler Nos. 3 (34 MM BTU per hour) and 4 (32 MM BTU per hour) are replaced by one gas-fired turbine (occupying Boiler No. 4 space) for electric power generation and heat recovery unit with duct burner (occupying Boiler No. 3 space). Permit revision application is being reviewed by AQD (John Vial). Boiler Nos. 1 and 2 (each 100 MM BTU per hour) will continue to operate as usual generating hot water for space heating. Mr. John Vial stated to Oakland U a PTI waiver is not necessary since an application is in AQD Permit Queue. Nevertheless, Oakland must not operate the turbine until a valid permit is issued.

Natural gas-fired turbine (51.25 MM BTU per hour, no fuel back-up) provides mechanical energy to generate electric power. Waste Heat Recovery Unit (total 60 MM BTU per hour) together with duct burner (stand-alone

capacity 15 MM BTU per hour) produces hot water for space heating. The duct burner is equipped with 3 direct-fired burners.

Hot gases from the turbine can be fully or partially bypassed from WHRU. Such bypass will occur based upon amount of hot water needed. Just as the duct burner augments hot water generated, the flue gas bypass reduces hot water generated by WHRU. All flues gases, including bypass, WHRU, exhaust via same stack.

Like all boilers, heat recovery unit together with duct burner generate hot water and not steam.

Consistent with NSPS KKKK (4K), AQD may look into parametric monitoring in lieu of Continuous Emissions Monitoring System (CEMS for NOx).

Cold-cleaners

The cold-cleaners are located at the following sites:

1. Vehicle Maintenance and Building / Grounds (ZEP Dyna 143)
2. Golf-course Katke Maintenance (aqueous ARMAKAKLEEN MPC Cleaning Solution). Neither subject to RACT VOC rules nor NESHAP / MACT T because water based alkaline solution (pH = 11.5) is used. Non-combustible liquid; but may decompose upon heating.
3. SAE Grizz Racing PSS Garage(ZEP Dyna 143)

Two (2 of 3) Safety-Kleen cold-cleaners which use Safety-Kleen solvent (and not halogenated solvents) are present.

The cold-cleaners are subject rule 336.611 or 336.1707 depending on if it is new or existing. A cold-cleaner is exempt from Rule 336.1201 pursuant to Rule 281(h) or Rule 285(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.

About 2012, AQD sent DEQ's decals for "cold-cleaner operating procedures" for posting and complying with work-practice rules. I asked the university to follow the common sense work practice in the procedures.

The lids are mechanically assisted and kept closed when access is not required.

The Cold-cleaners are NOT Subject to: 40 CFR, Part 63, Subpart T, NESHAP/ MACT T, since solvents containing halogenated compounds are not used.

ZEP Dyna 143 Product Code 0366 Solvent

100% VOC solvent. Flash Point (FP) = 147 °F Pinsky-Martens Closed Cup. Auto Ignition = NA °F. Boiling Point (BP) = 368 °F @ 760 mm Hg. Vapor Pressure (VP) = 1 mm Hg at 68 °F. Specific Gravity (SG, Water = 1.0) = 0.79. Density (ρ) @ 68 °F = 6.58 lbs / gallon (0.789 kg / L). Flammability range = 1 %v (LEL) – 7%v (UEL).

ROP opt-out permit

ROP opt-out PTI No. 419-92B regulates only four boilers. Potential-to-Emit (PTE) NOx emissions corresponding to four boilers (PTI No. 419-92B, SC 14 limit: 84 tpy NOx and 1,200 million SCF NG / 12-mo) and two diesel generators (PTI No. 110-07, SC 1,2 & 1.3 limits: 110,000 gallons of diesel / 12-mo and 1,000 hours / 12-mo) is 98 (84 for four boilers and 14 generators) tons per year. There are other process equipment at Oakland such as two 0.63 MM BTU / hour boilers, two dynamometers (one engine using gasoline and one chassis using diesel) at Science & Engineering building. A couple of more dynamometers will be installed in New Engineering Central Building (under construction as of March 2013).

Pending approval of revised ROP opt-out permit, Oakland is in violation of Rule 336.1210 (Renewable Operating Permit). PTI revision application is pending with AQD (John Vial): PTI No. 419-92B → PTI No. 419-92C.

Conclusion:

Pending approval of revised opt-out permit, Oakland is in violation of Rule 336.1210. A turbine with waste heat recovery unit is being installed.

NAME J. McManahall DATE 01/12/2016 SUPERVISOR CJE



RKA PETROLEUM COMPANIES, INC.

28340 WICK ROAD
ROMULUS, MICHIGAN 48174
PHONE: (800) 875-FUEL
Phone: (734) 946-2199

Original Invoice
Page 1

Invoice No: 000767375
Order No: 0577131.00
Purchase Order No: P0042817 41924
Bill of Lading No: 95176
Message: 0900-1300 THURS FILL GENERATOR PAULEY HALL

Invoice Date: 08/30/2012
Load Date: 08/30/2012
Reference No: 0
Shipped Via: REX CARRIERS INC.

Bill To: 10AUNI
OAKLAND UNIVERSITY FM/GROUNDS
ATTN: ACCOUNTS PAYABLE
2200 N SQUIRREL ROAD
ROCHESTER, MI 483094474

Ship To: 10AUNI
OAKLAND UNIVERSITY FM
FM / GROUNDS
2200 N. SQUIRREL ROAD
ROCHESTER, MI 483090000

Product	Description	Price	Order Qty	Ship Qty	Extended Price
373D TW	DYED ULTRA LOW SULFUR DIESEL Dyed Diesel for Off Highway Use.Non-Taxa ble Use Only.Penalty for Taxable Use HC 3, NA1993 PG III	3.623	197.90	197.90	\$716.99
FDYX	FED DYED TAX EXEMPT	0.000		197.90	\$0.00
FSPILL	FEDERAL OIL SPILL TRUST FUND	0.0019		197.90	\$0.38
LUSTD	FED LUST TAX - DIESEL	0.001		197.90	\$0.20
MIDXOH	MI ST TX-EXMPT-DIESEL-OFF HWY	0.000		197.90	\$0.00
MISX	MI SALES TAX EXEMPT	0.000 %		716.99	\$0.00
MUST	MI UNDERGROUND STORAGE TANK	0.00875		197.90	\$1.73

Date Due: 09/29/2012

Invoice Total: \$719.30

Subject to correction of clerical errors
A service charge of 1 1/2% will be assessed to your account on all past due balances

RECEIVED

SEP 10 2012

FACILITIES MANAGEMENT
BUSINESS OFFICE

ULSD

Dyed ULSD (15ppm S)
197.90 gal

\$ 716.99

\$ 3.623
gal

Generators

Send to Cora January 8, 2016

Month	Generator 1 - Consumption			Generator 2 - Consumption		
	Diesel (Gal)	NG (CCF)	Run Time (min)	Diesel (Gal)	NG (CCF)	Run Time (min)
Jan-15	0	0	0	0	0	0
Feb-15	0	0	0	0	0	0
Mar-15	0	0	0	0	0	0
Apr-15	28	26	53	13	1	12
May-15	22	12	41	391	38	254
Jun-15	22	14	47	39	8	50
Jul-15	21	21	37	35	26	38
Aug-15	0	0	0	0	0	0
Sep-15	16	26	0	35	0	0
Oct-15	0	14	0	0	22	0
Nov-15	0	0	0	0	0	0
Dec-15	3	5	38	3	27	36.5
Total	112	118	216	516	122	390.5

**OAKLAND UNIVERSITY'S MONTHLY NATURAL GAS USAGE FOR 12 MONTHS
(2-YEAR RECORD)**

MONTH	YEAR	MONTHLY GAS USAGE (mm SCF*)	TOTAL FOR 12 MONTH PERIOD (mm SCF)
December	2013	29.8	234.09
January	2014	36.8	241.02
February	2014	32.04	244.66
March	2014	30.68	248.31
April	2014	17.2	247.38
May	2014	11.19	247.63
June	2014	12.65	247.17
July	2014	13.26	247.16
August	2014	11.06	245.11
September	2014	13.07	246.28
October	2014	16.19	246.57
November	2014	25.16	249.10
December	2014	27.54	246.84
January	2015	35.65	245.69
February	2015	36.97	250.62
March	2015	26.89	246.83
April	2015	16.28	245.91
May	2015	11.47	246.19
June	2015	10.85	244.39
July	2015	12.07	243.20
August	2015	11.58	243.72
September	2015	12.27	242.92
October	2015	14.04	240.77
November	2015	16.91	232.52

NG Usage MM SCF

* Million Standard Cubic Feet