

**ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM**

December 19, 2013

SUBJECT: University of Pittsburgh, Campus
3412 Forbes Avenue,
Pittsburgh, PA 15260

Title V Operating Permit: No. 0647

TO: Sandra L. Etzel
Chief Engineer

FROM: Melissa Jativa
Air Quality Engineer

FACILITY DESCRIPTION:

The University of Pittsburgh is a public university located in Pittsburgh. The source consists of one (1) campus-wide painting, one (1) Melwood spray booth, one (1) Thomas Blvd spray booth, one (1) printing operations, one (1) Melwood laminate spray area, seventy-seven (77) natural gas-fired boilers, six (6) natural gas fired boilers using No. 2 fuel oil as backup fuel, thirteen (13) natural gas-fired space heaters, thirty-one (31) natural gas-fired hot water heaters, sixty-seven(67) diesel-fired emergency generator engines, and four (4) natural gas-fired emergency generator engines. There is one diesel storage tank associated with each diesel fired emergency generator and the boilers using fuel oil as backup fuel.

The University of Pittsburgh is a minor source of particulate matter (PM), particulate matter of 10 microns or less in diameter (PM₁₀), particulate matter of 2.5 microns or less in diameter (PM_{2.5}), sulfur oxides (SO_x), volatile organic compounds (VOCs), and hazardous air pollutants (HAPs), and a major source of nitrogen oxides (NO_x), and carbon monoxide (CO) as defined in section 2101.20 of Article XXI. The facility is also a major source of greenhouse gas emissions (CO₂e) as defined in the U.S. EPA Greenhouse Gas Tailoring Rule.

EMISSION SOURCES:

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
CP1	Campus-Wide Painting	Uncontrolled	5,085 gallons/yr	Paints and Solvents	-
SP1	Melwood Spray Booth Furniture Painting	Fabric Filter	150 gallons/yr	Paints and Solvents	SP1
SP2	Thomas Blvd Spray Booth	Fabric Filter	75 gallons/yr	Paints and Solvents	SP2
PP1	University Literature Printing (Cathedral)	Uncontrolled	4,664 gallons/yr	Inks and Solvents	-

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
PLS1	Laminate Spray Area (Melwood)	Fabric Filter	210 gallons/yr	Adhesives	LS1
B1 through B9	Nine (9) AO Smith Boilers (Fraternity Boilers)	Uncontrolled	0.44 MMBtu/hr (3.96 MMBtu/hr total)	Natural Gas	SB1 through SB9
B10 through B17	Eight (8) Hydro Therm / Ace Boiler MR-900 B-P (Sutherland Hall)	Uncontrolled	0.30 MMBtu/hr (2.4 MMBtu/hr total)	Natural Gas	SB10
B22A and B22B	Two (2) AO Smith Boilers; DB- 7205110E (Forbes Craig Bldg)	Uncontrolled	0.91 MMBtu/hr (1.82 MMBtu/hr total)	Natural Gas	SB22
B23A	Bryan Boilers RW1050-S-15-FDG (Biotech Building)	Uncontrolled	10.7 MMBtu/hr	Natural Gas	B23
B23B	Bryan Boilers RW1050-S-15-FDG (Biotech Building)	Uncontrolled	8.7 MMBtu/hr	Natural Gas	B23
B23C	Bryan Boilers RW1050-S-15-FDG (Biotech Building)	Uncontrolled	8.7 MMBtu/hr	Natural Gas	B23
B26	Peerless Boiler 211A-06-W (Child Care Center)	Uncontrolled	1.05 MMBtu/hr	Natural Gas	SB26
B27	AO Smith Boiler LB-1000-920 (Eureka)	Uncontrolled	1.00 MMBtu/hr	Natural Gas	SB27
B28A through B28G	Seven (7) Raypack / Ajax Boilers; H4-1223A-CCDCCDA (Forbes Residence Hall)	Uncontrolled	1.00 MMBtu/hr (7.00 MMBtu/hr total)	Natural Gas	SB28
B30A and B30B	Two (2) Peerless Boilers 211-6-VW-1 (Craig Hall)	Uncontrolled	1.05 MMBtu/hr (2.10 MMBtu/hr total)	Natural Gas	SB32
B31	Peerless Boiler 211-10-S-1 (Falk School)	Uncontrolled	1.89 MMBtu/hr	Natural Gas	SB31
B33A, B33B, B33C	Three (3) American Standard 4BN-J2 (310 Oakland Ave)	Uncontrolled	0.164 MMBtu/hr, 0.164 MMBtu/hr, 0.125 MMBtu/hr (0.453 MMBtu/hr total)	Natural Gas	SB33
B34	Utica Boiler PEG-3000-C1DE (318 Oakland Ave)	Uncontrolled	0.38 MMBtu/hr	Natural Gas	SB34
B35A through B35C	Three (3) Galaxy Boilers GG- 250 (306 Oakland Ave)	Uncontrolled	0.25 MMBtu/hr (0.75 MMBtu/hr total)	Natural Gas	SB35

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
B36	Burnham Boiler 208NCL-TE12 (264 Oakland Ave Apts)	Uncontrolled	0.24 MMBtu/hr	Natural Gas	SB36
B37	Crane Boiler 7-202 (268 Oakland Ave Apts)	Uncontrolled	0.18 MMBtu/hr	Natural Gas	SB37
B38	Weil-McLain Boiler H-10 (296-306 Oakland Ave)	Uncontrolled	0.54 MMBtu/hr	Natural Gas	SB38
B39A through B39C	Three (3) Weil-McLain Boilers HE-6 (College Garden Apts - 5820 Elwood)	Uncontrolled	0.167 MMBtu/hr (0.50 MMBtu/hr total)	Natural Gas	SB39
B40A and B40B	Two (2) Hydro-Therm Boilers R-250B (College Garden Apts -5830 Elwood)	Uncontrolled	0.25 MMBtu/hr (0.50 MMBtu/hr total)	Natural Gas	SB40
B41A and B41B	Two (2) Hydro-Therm Boilers R-250C-PV (College Garden Apts - 5840 Elwood)	Uncontrolled	0.25 MMBtu/hr (0.50 MMBtu/hr total)	Natural Gas	SB41
B42A and B42B	Two (2) Hydro-Therm Boilers R-250C-PV (College Garden Apts - 5821 Walnut)	Uncontrolled	0.25 MMBtu/hr (0.50 MMBtu/hr total)	Natural Gas	SB42
B43A and B43B	Two (2) Hydro-Therm Boilers R-250B (College Garden Apts - 5831 Walnut)	Uncontrolled	0.25 MMBtu/hr (0.50 MMBtu/hr total)	Natural Gas	SB43
B44A through B44C	Three (3) Weil-McLain Boilers HE-6 (College Garden Apts - 5841 Walnut)	Uncontrolled	0.167 MMBtu/hr (0.50 MMBtu/hr total)	Natural Gas	SB44
B45	One (1) Weil-McLain Boiler LGB-8 (263 Atwood Ave Apts)	Uncontrolled	0.91 MMBtu/hr	Natural Gas	SB45
B46	One (1) Crane Boiler 13-36A (305 Atwood Ave Apts)	Uncontrolled	0.87 MMBtu/hr	Natural Gas	SB46
B47	One (1) Bryan Boiler CLM150- W-G1 (Mayflower Apts - 141 N. Dithridge)	Uncontrolled	1.44 MMBtu/hr	Natural Gas	SB47
B48	Six (6) Nebraska Boilers (Carillo Street Steam Plant)	Uncontrolled	140 MMBtu/hr (840 MMBtu/hr total)	Natural Gas	B48-1 through B48-6
B49A and B49B	Two (2) Lochinvar Boilers (3343 Forbes Ave)	Uncontrolled	1.44 MMBtu/hr (2.88 MMBtu/hr total)	Natural Gas	SB48

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
B50A and B50B	Two (2) Kewanee Boilers (Thomas Blvd)	Uncontrolled	2.145 MMBtu/hr (4.29 MMBtu/hr total)	Natural Gas	SB50
B51	One (1) Burnham Boiler P-207-WI (260 Oakland Ave Apts)	Uncontrolled	0.198 MMBtu/hr	Natural Gas	SB36
B52A through B52C	Three (3) Galaxy Boiler (234-236 Oakland Ave Apts)	Uncontrolled	0.20 MMBtu/hr (0.60 MMBtu/hr total)	Natural Gas	SB36
B53A and B53B	Two (2) Lochinvar Boilers (3343 Forbes Ave)	Uncontrolled	0.50 MMBtu/hr (1.00 MMBtu/hr total)	Natural Gas	SB48
B54	One (1) Fulton Boiler PHW-1000 (Public Safety Bldg)	Uncontrolled	0.84 MMBtu/hr	Natural Gas	SB54
B55A and B55B	Two (2) NG Boilers (Panther Hall)	Uncontrolled	3.5 MMBtu/hr (7.0 MMBtu/hr total)	Natural Gas	SB55
B56A and B56B	Two (2) NG Boilers (PA Hall)	Uncontrolled	3.5 MMBtu/hr (7.0 MMBtu/hr total)	Natural Gas	SB56
H1A and H1B	Two (2) Forced Air Heaters Dayton 4LX62, Reznor BEX250 (Motor Pool)	Uncontrolled	0.10 MMBtu/hr (0.20 MMBtu/hr total)	Natural Gas	SH1
H2A through H2F	Six (6) Radiant Heaters #2 Solaronics (Melwood Warehouse)	Uncontrolled	0.15 MMBtu/hr (0.90 MMBtu/hr total)	Natural Gas	-
H3A through H3E	Five (5) Infrared Heaters Vintage HE80N, HE100N-40 (Public Safety Building)	Uncontrolled	3 – 1.0 MMBtu/hr, 2 – 0.8 MMBtu/hr (4.6 MMBtu/hr total)	Natural Gas	-
HW1 through HW18	Eighteen (18) AO Smith Boilers; BT-100 (Fraternity Hot Water Tank)	Uncontrolled	0.075 MMBtu/hr (1.35 MMBtu/hr total)	Natural Gas	SHW1 through SHW18
HW19 through HW22	Four (4) ACE Breecher Boilers; B-11 (Sutherland Hot Water Tanks)	Uncontrolled	1.06 MMBtu/hr (4.24 MMBtu/hr total)	Natural Gas	SHW19 through SHW22
HW23 and HW24	Two (2) AJAX Boilers; B86 (Forbes Residence Hall Hot Water Tanks)	Uncontrolled	0.80 MMBtu/hr (1.60 MMBtu/hr total)	Natural Gas	SHW23 and SHW24
HW25	Patterson-Kelley Boiler; NB-88860 (Ruskin Hall Hot Water Heater)	Uncontrolled	1.10 MMBtu/hr	Natural Gas	SHW25
HW26	AO Smith Hot Water Heater – GCVX 50 100 (3343 Forbes Ave)	Uncontrolled	0.065 MMBtu/hr	Natural Gas	SHW25

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
HW27	AO Smith Hot Water Heater – M2TW75T6BN (Thackeray Hall)	Uncontrolled	0.076 MMBtu/hr	Natural Gas	SHW27
HW28	AO Smith Hot Water Heater – HWZ00M890 (Thaw Hall)	Uncontrolled	0.190 MMBtu/hr	Natural Gas	SHW28
HW29	AO Smith Hot Water Heater – BTR-200-110 (SRCC)	Uncontrolled	0.199 MMBtu/hr	Natural Gas	SHW29
HW30	Hot Water Heater (Panther Hall)	Uncontrolled	0.99 MMBtu/hr	Natural Gas	SHW29
HW31	Hot Water Heater (PAHall)	Uncontrolled	0.99 MMBtu/hr	Natural Gas	SHW29
DG1	Emergency Generator Cummins Onan 80DGDA (Eberly Hall)	Uncontrolled	80 kW	No. 2 Fuel Oil	SDG1
DG2	Emergency Generator Onan; 50-DGDA (Bellefield Hall)	Uncontrolled	50 kW	No. 2 Fuel Oil	SDG2
DG3	Emergency Generator Kohler 200ROZD71 (Bendum Hall)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG3
DG4	Emergency Generator Kohler 750ROZD71 (Biotech Building)	Uncontrolled	680 kW	No. 2 Fuel Oil	SDG4
DG5	Emergency Generator Caterpillar 3412 (Cathedral Of Learning)	Uncontrolled	600 kW	No. 2 Fuel Oil	SDG5
DG6	Emergency Generator Onan; DFAC-4488188 (Chevron)	Uncontrolled	250 kW	No. 2 Fuel Oil	SDG6
DG7	Emergency Generator Onan; DGCB-3373593 (Clapp Hall)	Uncontrolled	60 kW	No. 2 Fuel Oil	SDG7
DG8	Emergency Generator Olympian C125P1 (Crawford Hall)	Uncontrolled	125 kW	No. 2 Fuel Oil	SDG8
DG9	Emergency Generator Olympian D100P1 (David Lawrence)	Uncontrolled	100 kW	No. 2 Fuel Oil	SDG9
DG10	Emergency Generator Onan; DGFC-3381687 (Eureka Building)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG10
DG11	Emergency Generator Onan; 25DKAF (Field House)	Uncontrolled	25 kW	No. 2 Fuel Oil	SDG11

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
DG12	Emergency Generator Cummins DGFB-4963250 (Forbes Residence Hall)	Uncontrolled	175 kW	No. 2 Fuel Oil	SDG12
DG13	Emergency Generator Onan; DFCB-3381249 (Forbes Quad)	Uncontrolled	300 kW	No. 2 Fuel Oil	SDG13
DG16	Emergency Generator Kohler 80ROZJ71 (Library of Info Science)	Uncontrolled	80 kW	No. 2 Fuel Oil	SDG16
DG17	Emergency Generator Olympian D200P1 (Alumni Hall)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG17
DG18	Emergency Generator Onan 750-DYC-15R (Mervis Hall)	Uncontrolled	75 kW	No. 2 Fuel Oil	SDG18
DG19	Emergency Generator Olympian D200P1 (Old Engineering Building)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG19
DG20	Emergency Generator Caterpillar SR-4 (Salk Hall)	Uncontrolled	750 kW	No. 2 Fuel Oil	SDG20
DG21	Emergency Generator Onan 250DFBE (S and S Garage)	Uncontrolled	250 kW	No. 2 Fuel Oil	SDG21
DG22	Emergency Generator Olympian D100P1 (Thackeray Hall)	Uncontrolled	100 kW	No. 2 Fuel Oil	SDG22
DG23	Emergency Generator Olympian D150P2 (Thaw Hall)	Uncontrolled	150 kW	No. 2 Fuel Oil	SDG23
DG24	Emergency Generator Onan 400DFCE (Litchfield Towers)	Uncontrolled	275 kW	No. 2 Fuel Oil	SDG24
DG25	Emergency Generator Onan 200DGFC (Lothrop Hall)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG25
DG26	Emergency Generator Caterpillar 3406 (Lothrop Hall)	Uncontrolled	400 kW	No. 2 Fuel Oil	SDG26
DG27	Emergency Generator Kohler 275RHOZ81 (William Pitt Union)	Uncontrolled	275 kW	No. 2 Fuel Oil	SDG27
DG28	Emergency Generator Kohler 230ROZ81 (Centre Plaza)	Uncontrolled	265 kW	No. 2 Fuel Oil	SDG28

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
DG29	Emergency Generator Caterpillar 3512TA (Petersen Events Center)	Uncontrolled	1,250 kW	No. 2 Fuel Oil	SDG29
DG30	Emergency Generator Kohler 400 (Sennot Square)	Uncontrolled	400 kW	No. 2 Fuel Oil	SDG30
DG31	Clark Control Fire Pump DDFR-03DT-5068F (Field House Fire Pump)	Uncontrolled	82 kW	No. 2 Fuel Oil	SDG31
DG32	Patterson Fire Pump (Litchfield Fire Pump)	Uncontrolled	65 kW	No. 2 Fuel Oil	SDG32
DG33-1	Emergency Generator Caterpillar 3456/SR4B (Carillo St.)	Uncontrolled	1,000 kW	No. 2 Fuel Oil	SDG33
DG33-2	Emergency Generator Caterpillar 3456/SR4B (Carillo St.)	Uncontrolled	1,000 kW	No. 2 Fuel Oil	SDG33
DG34	Emergency Generator Onan 400 DFCE (Eberly Hall #2)	Uncontrolled	400 kW	No. 2 Fuel Oil	SDG34
DG35	Emergency Generator Onan 35.0DGGD (Music Building)	Uncontrolled	35 kW	No. 2 Fuel Oil	SDG35
DG36	Emergency Generator Onan DGDB5628758 (3343 Forbes)	Uncontrolled	100 kW	No. 2 Fuel Oil	SDG36
DG37	Emergency Generator Kohler 60 (Frick Fine Arts)	Uncontrolled	62 kW	No. 2 Fuel Oil	SDG37
DG40	Emergency Generator Caterpillar 3508 (Life Science Annex)	Uncontrolled	1,000 kW	No. 2 Fuel Oil	SDG40
DG41	Emergency Generator Kohler 250REOZD (McGowan)	Uncontrolled	256 kW	No. 2 Fuel Oil	SDG41
DG42	Emergency Generator Kohler 400 REOZV-13C2 (PA Hall)	Uncontrolled	400 kW	No. 2 Fuel Oil	SDG42
DG43	Emergency Generator Caterpillar 3512 (BST-3)	Uncontrolled	1,500 kW	No. 2 Fuel Oil	SDG43
DG44	Emergency Generator Caterpillar 3516 (BST-3 #2)	Uncontrolled	1,750 kW	No. 2 Fuel Oil	SDG44
DG45	Emergency Generator Cummins DGDK (Trees Hall)	Uncontrolled	125 kW	No. 2 Fuel Oil	SDG45

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
DG46	Emergency Generator Cummins DGFS (Victoria Hall)	Uncontrolled	230 kW	No. 2 Fuel Oil	SDG46
DG47	Emergency Generator Cummins DFGE 5754681 (McCormick Quad)	Uncontrolled	750 kW	No. 2 Fuel Oil	SDG47
DG48	Emergency Generator Cummins DGCG-5710358 (Craig Hall)	Uncontrolled	80 kW	No. 2 Fuel Oil	SDG48
DG50	Emergency Generator Cummins/Onan (Sutherland)	Uncontrolled	300 kW	No. 2 Fuel Oil	SDG50
DG51	Emergency Generator Cummins/Onan (Frats 1 through 4)	Uncontrolled	16 kW	No. 2 Fuel Oil	SDG51
DG52	Emergency Generator Cummins/Onan (Frats 5 and 6)	Uncontrolled	11 kW	No. 2 Fuel Oil	SDG52
DG53	Emergency Generator Cummins/Onan (Frats 7 and 8)	Uncontrolled	7 kW	No. 2 Fuel Oil	SDG53
DG54	Emergency Generator Cummins/Onan (Panther Hall)	Uncontrolled	800 kW	No. 2 Fuel Oil	SDG54
DG56	Emergency Generator Cummins DQAD (Public Safety)	Uncontrolled	250 kW	No. 2 Fuel Oil	SDG56
DG57	Emergency Generator Kohler 150ROZJ (Law School)	Uncontrolled	150 kW	No. 2 Fuel Oil	SDG57
DG58	Emergency Generator Caterpillar C18 DITA (Benedum Hall)	Uncontrolled	600 kW	No. 2 Fuel Oil	SDG58
DG59	Emergency Generator Cummins DFED (Posvar Hall)	Uncontrolled	500 kW	No. 2 Fuel Oil	SDG59
DG60	Emergency Generator Cummins QSB5-DSFAD (Falk School)	Uncontrolled	60 kW	No. 2 Fuel Oil	SDG60
DG61	Emergency Generator Caterpillar C27 (Mid-Campus)	Uncontrolled	800 kW	No. 2 Fuel Oil	SDG61
DG62	Emergency Generator Cummins QSB7 (Olympic Sports Complex)	Uncontrolled	100 kW	No. 2 Fuel Oil	SDG62

ID	SOURCE DESCRIPTION (LOCATION)	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK ID
DG63	Emergency Generator Cummins DQGAB (Chevron Annex)	Uncontrolled	1500 kW	No. 2 Fuel Oil	SDG63
DG64	Emergency Generator Cummins DSGAC (University Club)	Uncontrolled	150 kW	No. 2 Fuel Oil	SDG64
DG65	Emergency Generator Koehler 100REOZJD (Forbes Craig)	Uncontrolled	100 kW	No. 2 Fuel Oil	SDG65
DG66	Diesel Fire Pump Engine Clarke P-DFPLYT-T2501 (University Club)	Uncontrolled	65 kW	No. 2 Fuel Oil	SDG66
DG67	Emergency Generator Cummins DSHAC-5857339 (Darragh Street)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG67
DG68	Emergency Generator Cummins DFAC-5659890 (Graduate School of Public Health)	Uncontrolled	250 kW	No. 2 Fuel Oil	SDG68
DG69	Emergency Generator Cummins DQHAB-5938319 (Ruskin Hall)	Uncontrolled	300 kW	No. 2 Fuel Oil	SDG69
DG70	Emergency Generator Cummins DGFC-5005544 (Thomas Blvd)	Uncontrolled	200 kW	No. 2 Fuel Oil	SDG70
DG71	Emergency Generator Caterpillar C-9 (Bouquet Gardens)	Uncontrolled	250 kW	No. 2 Fuel Oil	SDG71
DG72	Emergency Generator CAT C-18 (Salk Hall Addition)	Uncontrolled	600 kW	No. 2 Fuel Oil	SDG72
DG73	Emergency Generator Cummins QSX15-G9 (Nordenberg Hall)	Uncontrolled	350 kW	No. 2 Fuel Oil	SDG73
DG74	Emergency Generator Cummins QSK23-G7 (GSPH Addition)	Uncontrolled	750 kW	No. 2 Fuel Oil	SDG74
NG6	Emergency Generator Onan 175.0 WB-15R (Learning and Research Development Center)	Uncontrolled	175 kW	Natural Gas	SNG6
NG17	Emergency Generator Kohler 175RZ2828 (3343 Forbes Ave)	Uncontrolled	175 kW	Natural Gas	SNG17
NG18	Emergency Generator Cummins GGHG (Benedum Hall)	Uncontrolled	85 KW	Natural Gas	SNG18
NG19	Emergency Generator Cummins WSG-1068 (Victoria Hall)	Uncontrolled	100 KW	Natural Gas	SNG19

¹No. 2 fuel oil used as a back-up fuel only.

Miscellaneous Emission Sources:

University of Pittsburgh Campus has maintenance welding activities (WELD). Emissions are negligible. University of Pittsburgh Campus has maintenance parts cleaners using Safety Kleen solvent (MPC1). Emissions are negligible.

University of Pittsburgh Campus has paved roads and parking lots. Fugitive emissions are negligible. University of Pittsburgh Campus has diesel fuel storage tanks (T001) for each diesel-fired emergency generator engine and for the six boilers using fuel oil as backup fuel. Emissions from the tanks are estimated to be 84.37 pounds per year.

Emission Controls:

The emissions from Campus-Wide Painting (CP1) and University Literature Printing (PP1) are uncontrolled. The particulate emissions from the Melwood Spray Booth (SP1) and the Laminate Spray Area (PLS1) are controlled with a fabric filter. VOC and HAP emissions are uncontrolled. The emissions from the natural gas-fired boilers located at the Carillo Street Steam Plant (B48-1 through B48-6) are controlled with ultra low-NOx burners and flue gas recirculation. Emissions from all other natural gas-fired boilers located on campus are uncontrolled. The emissions from the natural gas-fired space heaters and natural gas-fired hot water heaters are uncontrolled. The emissions from the diesel-fired emergency generator engines, fire pump engines and natural gas-fired emergency generator engines are uncontrolled.

EMISSION CALCULATIONS:

Surface Coating: Campus-Wide Painting (CP1), Melwood Spray Booth (SP1), Thomas Blvd. Spray Booth (SP2), University Literature Printing (PP1), and the Laminate Spray Area (PLS1):

Emissions calculations for particulate, VOC and HAP emissions from the surface coating facilities are provided in Appendix A, page 9 to this document. Emission calculations are based on source reports of the amounts and types of inks, coatings and solvents used. Emissions have been scaled up from 4,160 actual hours of operation to 8,760 potential hours of operation. A 15% adjustment was added to all emissions to account for operational variability. The following table shows the maximum potential emissions from the surface coating facilities.

Maximum Potential Emissions for Surface Coating Facilities CP1, SP1, SP2, PP1, and PLS1

POLLUTANT	HOURLY EMISSION LIMIT (lb/hr) ¹	ANNUAL EMISSION LIMIT (tons/year) ¹
VOC	2.86	10.3
Total HAPs	0.14	0.55

¹ A year is defined as any consecutive 12-month period.

Natural Gas-fired Boilers, Space Heaters and Water Heaters < 5 MMBtu/hr (B1 through B22B, B26 through B28G, B30A through B47, B49A through B56B, H1A through H3E, and HW1 through HW31):

Emission calculations are provided in Appendix A, page 2 and 3 to this document for the natural gas-fired boilers, space heaters and water heater with a rating less than 5 MMBtu/hr. Emission calculations for SO_x, VOC, NO_x, CO, and HAP were based on emission factors found in U.S. EPA AP-42 Section 1.4: Natural Gas Combustion (7/98). PM and PM10 emissions were based on Article XXI emission limits (§2104.02). A 15% adjustment was added to all emissions calculated with AP-42 factors to account for operational variability. See Appendix A, page 2 and 3 for the hourly emission limits for each of the small

boilers.

GHG Mass and CO₂e Emissions:

Calculations of greenhouse gases (GHG) and CO₂-equivalent (CO₂e) emissions are based on the methodology found in 40 CFR Part 98, Subpart C, §98.33(a)(1), and factors found in Table C-1 and Table C-2 of that subpart.

The rated heat input capacity of the boilers, space heaters and water heaters = 72.27 MMBtu/hr × 8760 hr/yr = 633,085 MMBtu/yr

Emission Factors: CO₂ = 53.02 kg/MMBtu
 N₂O = 1 × 10⁻⁴ kg/MMBtu/hr
 CH₄ = 1 × 10⁻³ kg/MMBtu/hr

CO₂: 633,085 MMBtu/yr × 53.02 kg/MMBtu ÷ 1,000 kg/metric ton = 33,566 metric tons/year
 N₂O: 633,085 MMBtu/yr × 1 × 10⁻⁴ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.063 metric tons/year
 CH₄: 633,085 MMBtu/yr × 1 × 10⁻³ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.633 metric tons/year

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1):

CO₂ = 1
 N₂O = 310
 CH₄ = 21

CO₂e = (33,566 × 1) + (0.063 × 310) + (0.633 × 21) = 33,599 MT/year of CO₂e
 = **37,035 tpy of CO₂e**

The following table shows the total annual potential emissions for all of the boilers, space heaters and water heaters with a rating less than 5 MMBtu/hr.

**Emission Limitations for B1 – B22B, B26- B28G,
 B30A – B47, B49A - B56B, H1A – H3E, and HW1 – HW31**

POLLUTANT	HOURLY EMISSION LIMIT (lbs/hr)	COMBINED ANNUAL EMISSION LIMIT (tons/year) ^{1, 2}
PM	(See Appendix A for the pound per hour emission limits for each of the individual boilers)	2.41
PM ₁₀		2.41
PM _{2.5}		2.41
SO ₂		0.20
NO _x		33.49
VOC		1.84
CO		28.13
HAPs		0.63

¹ A year is defined as any consecutive 12-month period.

² Combined limit is for all boilers.

Natural Gas-fired Boilers 5 MMBtu/hr – 15 MMBtu/hr (B23A, B23B, and B23C):

Emission calculations are provided in Appendix A, page 4 to this document for the natural gas-fired boilers with a rating greater than 5 MMBtu/hr and less than 15 MMBtu/hr. Emission calculations for SO_x, VOC, NO_x, CO, and HAP were based on emission factors found in U.S. EPA AP-42 Section 1.4: Natural Gas Combustion (7/98). Particulate Matter emissions were based on Article XXI emission limits (§2104.02). A 15% adjustment was added to all emissions calculated with AP-42 factors to account for operational variability. All PM is assumed to be PM₁₀, and all PM₁₀ is assumed to be PM_{2.5}. The following table shows the total annual potential emissions for all of the boilers with a rating greater than 5

MMBtu/hr and less than 15 MMBtu/hr. See Appendix A, page 4 for the hourly emission limits for each of the boilers.

GHG Mass and CO_{2e} Emissions:

The rated heat input capacity of boilers B23A, B23B, and B23C = 28.04 MMBtu/hr × 8760 hr/yr = 245,630 MMBtu/yr

CO₂: 245,630 MMBtu/yr × 53.02 kg/MMBtu ÷ 1,000 kg/metric ton = 13,023 metric tons/year
 N₂O: 245,630 MMBtu/yr × 1 × 10⁻⁴ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.025 metric tons/year
 CH₄: 245,630 MMBtu/yr × 1 × 10⁻³ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.246 metric tons/year

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1):

CO₂ = 1
 N₂O = 310
 CH₄ = 21

$$\text{CO}_2\text{e} = (13,023 \times 1) + (0.025 \times 310) + (0.246 \times 21) = 13,036 \text{ MT/year of CO}_2\text{e}$$

$$= \mathbf{14,370 \text{ tpy of CO}_2\text{e}}$$

The following table shows the total annual potential emissions for all of the boilers, space heaters and water heaters with a rating greater than 5 MMBtu/hr and less than 15 MMBtu/hr.

Emission Limitations for B23A, B23B, and B23C

POLLUTANT	HOURLY EMISSION LIMIT (lbs/hr)	COMBINED ANNUAL EMISSION LIMIT (tons/year) ^{1,2}
PM	(See Appendix A for the pound per hour emission limits for each of the individual boilers)	0.98
PM ₁₀		0.98
PM _{2.5}		0.98
SO ₂		0.08
NO _x		13.85
VOC		0.76
CO		11.63
HAPs		0.26

¹ A year is defined as any consecutive 12-month period.

² Combined limit is for all boilers.

Carillo Street Boilers (B48-1 through B48-6):

Emission calculations are provided in Appendix A, pages 5 and 6 to this document for boilers B48-1 through B48-6. Hourly emission limits for PM, PM₁₀, SO_x, VOC, NO_x, and CO for boilers B48-1 through B48-3 were established in Installation Permit 0678-I001, issued May 4, 2004. Hourly emission limits for PM, PM₁₀, SO_x, VOC, NO_x, and CO for boilers B48-4 through B48-6 were established in Installation Permit 0678-I002, issued April 14, 2008. Hourly and yearly emission limits for boilers B48-1 through B48-6 for CO and NO_x were established in Installation Permit 0678-I002, issued April 14, 2008. Yearly natural gas usage limits and fuel oil usage limits for boilers B48-1 through B48-6 were established in Installation Permit 0678-I002, issued April 14, 2008. These limits are shown in the table below. Calculations for the potential to emit of HAP were based on emission factors found in U.S. EPA AP-42 Section 1.4: Natural Gas Combustion (7/98) and Section 1.3: Fuel Oil Combustion (9/98). A 15% adjustment was added to HAP emissions calculated with AP-42 factors to account for operational variability. The permittee has accepted limits on fuel usage in these boilers.

GHG Mass and CO_{2e} Emissions:

The University of Pittsburgh has taken a limit of 2900 MMCF/year (2,958,000 MMBtu/yr) potential annual natural gas usage on the Carillo Street boilers.

Emission Factors: $CO_2 = 53.02 \text{ kg/MMBtu}$
 $N_2O = 1 \times 10^{-4} \text{ kg/MMBtu/hr}$
 $CH_4 = 1 \times 10^{-3} \text{ kg/MMBtu/hr}$

$CO_2: 2,958,000 \text{ MMBtu/yr} \times 53.02 \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 156,833 \text{ metric tons/year}$
 $N_2O: 2,958,000 \text{ MMBtu/yr} \times 1 \times 10^{-4} \text{ kg/MMBtu/hr} \div 1,000 \text{ kg/metric ton} = 0.296 \text{ metric tons/year}$
 $CH_4: 2,958,000 \text{ MMBtu/yr} \times 1 \times 10^{-3} \text{ kg/MMBtu/hr} \div 1,000 \text{ kg/metric ton} = 2.958 \text{ metric tons/year}$

The University of Pittsburgh has taken a limit of 417,000 gal/year (58,380 MMBtu/yr) potential annual fuel oil usage on the Carillo Street boilers.

Emission Factors: $CO_2 = 73.96 \text{ kg/MMBtu}$
 $N_2O = 6 \times 10^{-4} \text{ kg/MMBtu/hr}$
 $CH_4 = 3 \times 10^{-3} \text{ kg/MMBtu/hr}$

$CO_2: 58,380 \text{ MMBtu/yr} \times 73.96 \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 4318 \text{ metric tons/year}$
 $N_2O: 58,380 \text{ MMBtu/yr} \times 6 \times 10^{-4} \text{ kg/MMBtu/hr} \div 1,000 \text{ kg/metric ton} = 0.035 \text{ metric tons/year}$
 $CH_4: 58,380 \text{ MMBtu/yr} \times 3 \times 10^{-3} \text{ kg/MMBtu/hr} \div 1,000 \text{ kg/metric ton} = 0.175 \text{ metric tons/year}$

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1):

$CO_2 = 1$
 $N_2O = 310$
 $CH_4 = 21$

$CO_2e = [(156,833+4318) \times 1] + [(0.296+0.035) \times 310] + [(2.958+0.175) \times 21] = 161,319 \text{ MT/year of } CO_2e$
= 177,822 tpy of CO_2e

The following table shows the limited hourly emissions for each of the boilers and limited total annual emissions for the Carillo Street boilers.

Limited Potential Emissions for Boilers B48-1 through B48-6

POLLUTANT	HOURLY EMISSION LIMIT (Each Boiler) (lbs/hr)		TOTAL ANNUAL EMISSION LIMIT (All Six Boilers) (tons/year) ^{1, 2}
	Natural Gas	Fuel Oil	Both Fuels
PM	0.7	5.4	8.56
PM ₁₀	0.7	5.4	8.56
PM _{2.5}	0.7	1.35	7.69
SO ₂	0.084	6.95	2.39
NO _x	1.61	9.45	19.05
VOC	0.77	0.68	8.28
CO	5.43	10.53	59.59
HAPs	--	--	3.28

¹ A year is defined as any consecutive 12-month period.

² Combined limit is for all boilers.

DG74):

There are sixty-seven (67) diesel-fired emergency generator engines located at various buildings on the University of Pittsburgh campus. Detailed emission calculations for these generator engines are shown on Appendix A, page 6 and 7 to this document. Emission calculations were based on manufacturer data or U.S. EPA AP-42 Chapter 3.4, when manufacturer data was not available. A 15% adjustment factor was added to all emissions calculated using AP-42 factors to account for operational variability of equipment. Emission limits for emergency generator DG33-1 were established in Installation Permit 0678-I001, issued May 4, 2004. Emission limits for emergency generator DG33-2 were established in Installation Permit 0678-I002, issued April 14, 2008. Yearly limits of 150 operating hours per year were established for emergency generators DG33-1 and DG33-2 in Installation Permit 0678-I001 and Installation Permit 0678-I002, respectively. Emission limits and yearly limits of 400 operating hours per year for emergency generators DG56 – DG63 were established in Installation Permit 0647-I001. The permittee has accepted limits of 400 operating hours per year for generator engines DG09, DG16, and DG17. All other diesel generator engines have a limit of 100 operating hours per twelve consecutive month period. The following table shows the limited total annual emissions for all diesel-fired emergency generator engines. See Appendix A, page 8 for the hourly emission limits for each of these generator engines.

**Limited Potential Emissions for
 Generator Engines DG1 – DG13, DG16 – DG37, DG40 – DG54, DG56 – DG741**

POLLUTANT	HOURLY EMISSION LIMIT (lbs/hr)	COMBINED ANNUAL EMISSION LIMIT (tons/year)^{1, 2}
PM	(See Appendix A)	1.26
PM ₁₀	(See Appendix A)	1.26
SO ₂	(See Appendix A)	2.26
NO _x	(See Appendix A)	51.97
VOC	(See Appendix A)	2.59
CO	(See Appendix A)	10.61

¹ A year is defined as any consecutive 12-month period.

² Combined limit for all of these emergency generator engines.

GHG Mass and CO_{2e} Emissions:

Total rated heat input capacity of the diesel generators = 12,882 MMBtu/yr

Emission Factors: CO₂ = 73.96 kg/MMBtu
 N₂O = 6 × 10⁻⁴ kg/MMBtu/hr
 CH₄ = 3 × 10⁻³ kg/MMBtu/hr

CO₂: 12,882 MMBtu/yr × 73.96 kg/MMBtu ÷ 1,000 kg/metric ton = 953 metric tons/year
 N₂O: 12,882 MMBtu/yr × 6 × 10⁻⁴ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.008 metric tons/year
 CH₄: 12,882 MMBtu/yr × 3 × 10⁻³ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.039 metric tons/year

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1):

CO₂ = 1
 N₂O = 310
 CH₄ = 21

CO_{2e} = [953 × 1] + [0.008 × 310] + [0.039 × 21] = 956 MT/year of CO_{2e}

= 1,054 tpy of CO₂e

Natural Gas-fired Emergency Generator Engines (NG-6, NG-17, NG-18, NG-19)

There are four (4) natural gas-fired emergency generator engines located at various buildings on the campus. Emission calculations are provided in Appendix A, page 9 to this document for the natural gas-fired emergency generator engines. Emission calculations were based on U.S. EPA AP-42 emission factors for natural gas-fired engines from Chapter 3.2, Table 3.2-2, published July 2000. A 15% adjustment factor was added to all emissions calculated using AP-42 factors to account for operational variability of equipment. The permittee has requested that the operating hours of generator engine NG-17 be limited to 400 hours per year and all other natural gas-fired emergency generator engines be limited to 100 hours per year each. The following table shows the limited total annual potential emissions for these natural gas-fired generator engines. See Appendix A, page 9 for the hourly emission limits for each of these natural gas-fired generator engines.

**Limited Potential Emissions for Natural Gas-fired Generator Engines
 NG6, NG17, NG18, and NG19**

POLLUTANT	HOURLY EMISSION LIMIT (lbs/hr)	COMBINED ANNUAL EMISSION LIMIT (tons/year)^{1, 2}
PM	(See Appendix A)	0.002
PM ₁₀	(See Appendix A)	0.002
SO ₂	(See Appendix A)	1.2E-04
NO _x	(See Appendix A)	0.16
VOC	(See Appendix A)	0.03
CO	(See Appendix A)	0.11

¹ A year is defined as any consecutive 12-month period.

² Combined limit for all of these emergency generator engines.

GHG Mass and CO₂e Emissions:

Total rated heat input capacity of the diesel generators = 361.8 MMBtu/yr

CO₂: 361.8 MMBtu/yr × 53.02 kg/MMBtu ÷ 1,000 kg/metric ton = 19.18 metric tons/year

N₂O: 361.8 MMBtu/yr × 1 × 10⁻⁴ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.00004 metric tons/year

CH₄: 351.8 MMBtu/yr × 1 × 10⁻³ kg/MMBtu/hr ÷ 1,000 kg/metric ton = 0.0004 metric tons/year

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1):

CO₂ = 1

N₂O = 310

CH₄ = 21

CO₂e = (19.18 × 1) + (0.00004 × 310) + (0.0004 × 21) = 19.2 MT/year of CO₂e
 = 21.2 tpy of CO₂e

No. 2 Fuel Oil Tanks (T001):

The permittee maintains diesel fuel storage tanks for each diesel-fired emergency generator engine and for the six boilers using fuel oil as backup fuel. VOC emissions are expected to be minimal due to the low turnover rate and low volatility of the stored liquid (fuel oil). Emission calculations using US EPA's TANKS version 4.0 are shown in Appendix A, page 11 to this document.

EMISSIONS SUMMARY (Entire Source):

Limited Potential Emissions for Entire Source

POLLUTANT	ANNUAL EMISSION LIMIT (tons/year) ¹
PM	13.22
PM ₁₀	13.22
PM _{2.5}	13.22
SO ₂	4.93
NO _x	118.51
VOC	23.82
CO	110.12
HAPs	4.75

¹ A year is defined as any consecutive 12-month period.

OPERATING PERMIT APPLICATION COMPONENTS:

1. Operating Permit Application No. 0647, dated February 7, 2002;
2. Operating Permit Application Update No. 0647, dated July 22, 2003;
3. Installation Permit Application No. 0647, dated November 21, 2003;
4. Installation Permit No. 0678-I001, issued May 4, 2004;
5. Installation permit Amendment No 0678-I001a, issued August 30, 2005;
6. Operating Permit Application Update No. 0647, dated September 28, 2006;
7. Operating Permit Application Update No. 0647, dated February 5, 2007;
8. Operating Permit Application Update No. 0647, dated March 5, 2008;
9. Installation Permit No. 0678-I002, issued April 14, 2008;
10. Supplemental information from email, dated March 11, 2009;
11. Title V Operating Permit Application No. 0647, dated August 29, 2011;
12. Supplemental information from email, dated November 2, 2011;
13. Title V Operating Permit Application Update No. 0647, dated December 20, 2011;
14. Supplemental information from email, dated May 8, 2013; and
15. Supplemental information from email, dated June 12, 2003.

REGULATORY APPLICABILITY:

1. **Article XXI Requirements for Issuance:**

The following Article XXI requirements apply to this facility:

§2103.12.a.2.B (Standards for Issuance): Existing sources, where no limits have been established under Article XXI, are subject to Reasonably Available Control Technology (RACT) requirements.

(a) Boilers B48-1 through B48-3: In this case, RACT will be consistent with the BACT determination performed at the time of Installation Permit #0678-I001 issuance. The Department has determined that RACT/BACT shall be:

- (1) Use of low NO_x burners and flue gas recirculation.
- (2) Only natural gas and No. 2 fuel oil shall be combusted in Boilers B48-1 through B48-3.

- (3) The total quantity of natural gas combusted in the boilers shall not exceed 1,450 million cubic feet (mmcf) during any consecutive 12-month period.
- (4) The total quantity of No. 2 fuel oil combusted in the boilers shall not exceed 208,000 gallons during any consecutive 12-month period.
- (5) At all times, the sulfur content of the No. 2 fuel oil combusted in the boilers shall not exceed 0.05% by weight.
- (6) No. 2 fuel oil shall only be combusted in the boilers as a backup fuel in emergency situations, including where natural gas is not available. The permittee shall notify the Department before combusting No. 2 fuel oil in the boilers.
- (7) Emissions of particulate matter from each boiler shall not exceed 0.005 lb/MMBtu when combusting natural gas or 0.04 lb/MMBtu when combusting fuel oil.
- (8) Emissions of nitrogen oxides from each boiler shall not exceed 9 parts per million (ppm) at 3% oxygen as an average concentration over any one (1) hour period when combusting natural gas.
- (9) Emissions of nitrogen oxides from each boiler shall not exceed 12 parts per million (ppm) at 3% oxygen at any time when combusting natural gas or 55 ppm at 3% oxygen when combusting No. 2 fuel oil.
- (10) Emissions of nitrogen oxides from each boiler shall not exceed 0.0115 lb/MMBtu when combusting natural gas or 0.070 lb/MMBtu when combusting fuel oil.
- (11) Emissions of CO from each boiler shall not exceed 50 ppm at 3% oxygen when combusting natural gas or 100 ppm at 3% oxygen when combusting fuel oil.
- (12) Emissions of CO from each boiler shall not exceed 0.03875 lb/MMBtu when combusting natural gas or 0.078 lb/MMBtu when combusting fuel oil.
- (13) Emissions of VOC from each boiler shall not exceed 0.0055 lb/MMBtu when combusting natural gas or 0.0050 lb/MMBtu when combusting fuel oil.
- (14) Emissions of sulfur oxides from each boiler shall not exceed 0.0006 lb/MMBtu when combusting natural gas or 0.0515 lb/MMBtu when combusting No. 2 fuel oil.
- (15) Emissions from boilers B48-1 through B48-3 shall not exceed the following at any time (§2102.04.b.6):

POLLUTANT	Emissions per Boiler (lb/hr)		Each Boiler (tons/year) ¹	B48-1, B48-2 & B48-3 Combined Emissions, (tons/year) ¹
	Natural Gas	No. 2 Fuel Oil		
Particulate Matter (PM ₁₀)	0.70	5.40	3.57	4.27
Sulfur Oxides (SO _x)	0.084	6.95	1.11	1.19
Nitrogen Oxides (NO _x)	1.61	9.45	7.90	9.52
Volatile Organic Compounds (VOC)	0.77	0.68	3.73	4.14
Carbon Monoxide (CO)	5.43	10.53	24.31	29.79

¹ A year is defined as any consecutive 12-month period.

- (b) Boilers B48-4 through B48-6: In this case, RACT will be consistent with the BACT determination performed at the time of Installation Permit #0678-I002 issuance. The Department has determined that RACT/BACT shall be:
 - (1) Use of low NO_x burners and flue gas recirculation.
 - (2) Only natural gas and No. 2 fuel oil shall be combusted in Boilers B48-4 through

- B48-6.
- (3) At all times, the sulfur content of the No. 2 fuel oil combusted in the boilers shall not exceed 0.05% by weight.
 - (4) No. 2 fuel oil shall only be combusted in the boilers as a backup fuel in emergency situations, including where natural gas is not available. The permittee shall notify the Department before combusting No. 2 fuel oil in the boilers.
 - (5) Emissions of particulate matter from each boiler shall not exceed 0.005 lb/MMBtu when combusting natural gas or 0.04 lb/MMBtu when combusting fuel oil.
 - (6) Emissions of nitrogen oxides from each boiler shall not exceed 9 parts per million (ppm) at 3% oxygen as an average concentration over any one (1) hour period when combusting natural gas.
 - (7) Emissions of nitrogen oxides from each boiler shall not exceed 12 parts per million (ppm) at 3% oxygen at any time when combusting natural gas or 55 ppm at 3% oxygen when combusting No. 2 fuel oil.
 - (8) Emissions of nitrogen oxides from each boiler shall not exceed 0.0115 lb/MMBtu when combusting natural gas or 0.070 lb/MMBtu when combusting fuel oil.
 - (9) Emissions of CO from each boiler shall not exceed 50 ppm at 3% oxygen when combusting natural gas or 100 ppm at 3% oxygen when combusting fuel oil.
 - (10) Emissions of CO from each boiler shall not exceed 0.03875 lb/MMBtu when combusting natural gas or 0.078 lb/MMBtu when combusting fuel oil.
 - (11) Emissions of VOC from each boiler shall not exceed 0.0055 lb/MMBtu when combusting natural gas or 0.0050 lb/MMBtu when combusting fuel oil.
 - (12) Emissions of sulfur oxides from each boiler shall not exceed 0.0006 lb/MMBtu when combusting natural gas or 0.0515 lb/MMBtu when combusting No. 2 fuel oil.
 - (13) Hourly emissions from boilers B48-4 through B48-6 shall not exceed the following at any time:

POLLUTANT	Emissions per Boiler (lb/hr)	
	Natural Gas	No. 2 Fuel Oil
Particulate Matter (PM ₁₀)	0.70	5.40
Particulate Matter (PM _{2.5})	0.70	1.35
Sulfur Oxides (SO _x)	0.084	6.95
Nitrogen Oxides (NO _x)	1.61	9.45
Volatile Organic Compounds (VOC)	0.77	0.68
Carbon Monoxide (CO)	5.43	10.53

¹ A year is defined as any consecutive 12-month period

- (c) Emergency Generator DG33-1: In this case, RACT will be consistent with the BACT determination performed at the time of Installation Permit #0678-I001 issuance. The Department has determined that RACT/BACT shall be:
 - (1) The permittee shall not operate or, allow to be operated the generator set unless the generator is properly installed, operated and maintained according to the manufacturer's specifications, at all times. A copy of the manufacturer's specifications shall be supplied to the Department for review and a copy shall be kept at the site.
 - (2) The permittee shall only combust No. 2 fuel oil with maximum allowable sulfur

- content of 0.05% by weight in the emergency generator.
- (3) Diesel fuel consumption in the generator set shall be limited to 71.2 gallons/hour.
 - (4) The generator set shall be limited to 150 hours of operation in any consecutive 12-month period.
 - (5) The generator set shall only be operated during emergency conditions when electrical power is not available or during periods of routine maintenance as specified by the manufacturer.
 - (6) Nitrogen oxide emissions from the generator shall not exceed 8.07 grams per brake horsepower-hour.
 - (7) Emissions from the generator set shall not exceed the following at any time:

POLLUTANT	Emissions, lbs/hr	Emissions tons/yr
Particulate Matter (PM ₁₀)	0.27	0.02
Sulfur Oxides (SO _x)	0.54	0.04
Nitrogen Oxides (NO _x)	23.86	1.79
Volatile Organic Compounds VOC)	0.65	0.05
Carbon Monoxide (CO)	1.51	0.11

(d) Emergency Generator DG33-2: In this case, RACT will be consistent with the BACT determination performed at the time of Installation Permit #0678-I002 issuance. The Department has determined that RACT/BACT shall be:

- (1) The permittee shall not operate or, allow to be operated the generator set unless the DG33-2 Emergency Diesel Generator is properly installed, operated and maintained according to the manufacturer's specifications, at all times. A copy of the manufacturer's specifications shall be supplied to the Department for review and a copy shall be kept at the site.
- (2) The permittee shall only combust No. 2 fuel oil with maximum allowable sulfur content of 0.05% by weight in the emergency generator.
- (3) Diesel fuel consumption in the generator set shall be limited to 73.3 gallons/hour.
- (4) The generator set shall be limited to 150 hours of operation in any consecutive 12-month period.
- (5) Nitrogen oxide emissions from the generator shall not exceed 6.59 grams per brake horsepower-hour.
- (6) The generator set shall only be operated during emergency conditions when electrical power is not available or during periods of routine maintenance as specified by the manufacturer.
- (7) Emissions from the generator set shall not exceed the following at any time:

POLLUTANT	Emissions, lbs/hr	Emissions tons/yr
Particulate Matter (PM ₁₀)	0.27	0.02
Sulfur Oxides (SO _x)	0.54	0.04
Nitrogen Oxides (NO _x)	23.86	1.79
Volatile Organic Compounds VOC)	0.65	0.05
Carbon Monoxide (CO)	1.51	0.11

- (e) Limits for fuel usage for boilers B48-1 through B48-6 were established with the BACT determination performed at the time of Installation Permit #0678-I001 issuance, issued May 4, 2004 and Installation Permit #0678-I002 issuance, issued April 14, 2008. The Department has determined that RACT/BACT shall be:
 - (1) The total quantity of natural gas combusted in Boilers B48-1 through B48-6 in the Carillo Street Steam Plant shall not exceed 2,900 million cubic feet (MMCF) during any consecutive 12-month period. [§2102.04.b.6, §2103.20.b.4, IP#0678-I001, IP#0678-I002]
 - (2) The total quantity of No. 2 fuel oil combusted in Boilers B48-1 through B48-6 in the Carillo Street Steam Plant shall not exceed 417,000 gallons during any consecutive 12-month period. [§2102.04.b.6, §2103.20.b.4, IP#0678-I001, IP#0678-I002]
- (f) Limits for emissions from boilers B48-1 through B48-6 and emergency generators DG33-1 and DG33-2 were established under Installation Permits #0678-I001 and #0678-I002, issued May 4, 2004 and April 14, 2008, respectively. The Department has determined that RACT/BACT shall be:
 - (1) Combined annual emissions from boilers B48-1 through B48-6 and the emergency generators DG33-1 and DG33-2 shall not exceed 23.0 tons per year of NO_x and 60 tons per year of CO.
- (g) The Department has determined that RACT for Campus-Wide Painting (CP1), Melwood Spray Booth (SP1), University Literature Printing (PP1), and the Laminate Spray Area (PLS1) shall be:
 - (1) The potential to emit as shown in Appendix A, page 9.
 - (2) Particulate emissions from the Melwood Spray Booth (SP1) and the Laminate Spray Area (PLS1) shall be controlled with a fabric filter.
- (h) The Department has determined that RACT for the existing boilers, space heaters, and water heaters B1 – B22B, B23A - B28C, B24A - B28G, B30A – B47, B49A-56B, H1A – H3E, and HW1 – HW31 shall be:
 - (1) Burn natural gas only.
 - (2) Emissions shall be limited to the potential to emit as shown in Appendix A, pages 2-4. Particulate limitations for boilers and heaters with a maximum heat input capacity greater than 0.5 MMBtu per hour have been established by §2104.02.a.1.
- (i) The Department has determined that RACT for the existing diesel-fired emergency generator engines DG1 – DG14, DG16 – DG37, DG40 – DG54, DG56 – DG74 is:
 - (1) The emergency generators shall only be operated during emergency conditions when electrical power is not available or during periods of routine maintenance as specified by the manufacturer.
 - (2) Emissions shall be limited to the potential to emit as shown in Appendix A, page 7. Particulate limitations have been established by §2104.02.a.1.
- (j) The Department has determined that RACT for the natural gas-fired emergency generator engines (NG-6, NG-17, NG-18, NG-19) is:

- (1) Burn natural gas only.
- (2) Emissions shall be limited to the potential to emit as shown in Appendix A, page 8. Particulate limitations for generator engines with a maximum heat input capacity greater than 0.5 MMBtu per hour have been established by §2104.02.a.1.
- (k) The Department has determined that RACT for the Melwood Spray Booth, the University Literature Printing, the Laminate Spray Area, the boilers, the diesel-fired emergency generator engines, the natural gas-fired space heaters, the natural gas-fired hot water heaters, the natural gas-fired emergency generator engines, and the diesel fuel oil storage tanks is to operate and maintain these emission units in accordance with the manufacturers' specification.

§2104.02.a.1 (Particulate Mass Emissions): This rule applies to fuel burning or combustion equipment where the actual heat input to such equipment is greater than 0.50 MMBtu per hour. This rule limits particulate matter emissions as follows:

- (a) Pursuant to this rule, particulate emissions from each boiler, space heater and hot water heater having a heat input capacity greater than 0.5 MMBtu per hour shall not exceed 0.008 lbs/MMBtu of actual heat input at any time while combusting natural gas.
- (b) Pursuant to this rule, particulate emissions from the Carillo Street boilers (B48-1 - B48-6) shall not exceed 0.015 lbs/MMBtu of actual heat input at any time while combusting fuel oil.
- (c) Pursuant to this rule, particulate emissions from each emergency generator engine having an actual heat input capacity greater than 0.50 MMBtu per hour shall not exceed 0.012 lb/MMBtu of actual heat input at any time while combusting natural gas.
- (d) Pursuant to this rule, particulate emissions from each emergency generator engine having an actual heat input capacity greater than 0.50 MMBtu per hour shall not exceed 0.28 lb/MMBtu of actual heat input at any time while combusting grade No. 2 fuel oil.

§2104.03.a.1 (Sulfur Oxide Emissions): This rule applies to fuel burning or combustion equipment fired only with natural gas. Pursuant to this rule, sulfur oxide emissions from each emission unit firing only natural gas shall be limited to the potential to emit.

§2104.03.a.2.A (Sulfur Oxide Emissions): This rule applies to fuel burning or combustion equipment burning a fuel other than natural gas and having an actual heat input capacity greater than 0.50 MMBtu per hour, but less than 50 million BTUs per hour. Pursuant to this rule, sulfur oxide emissions from each diesel-fired emergency generator engine with an actual heat input capacity greater than 0.50 MMBtu per hour shall not exceed 1.0 pound per million BTU of actual heat input.

§2105.10 (Surface Coating Processes):

- (a) The requirements of §2105.10 for Surface Coating Processes are not applicable to the Campus-Wide Painting (CP1) because this activity is not one of the surface coating process categories listed in Table 2105.10.
- (b) The requirements of §2105.10 for Surface Coating Processes are not applicable to the Melwood Spray Booth Furniture Painting (SP1) because this surface coating process

category does not emit VOCs into the outdoor atmosphere in quantities greater than 3 pounds per hour, 15 pounds per day, or 2.7 tons per year.

- (c) The requirements of §2105.10 for Surface Coating Processes are not applicable to the University Literature Printing (PP1) because this process is not a surface coating process.
- (d) The requirements of §2105.10 for Surface Coating Processes are not applicable to the Laminate Spray Area (Melwood) because this surface coating process category does not emit VOCs into the outdoor atmosphere in quantities greater than 3 pounds per hour, 15 pounds per day, or 2.7 tons per year.

§2105.11 (Graphic Arts Systems): The requirements of §2105.11 for Graphic Arts Systems are not applicable to the University Literature Printing (PP1) because this source does not have a potential uncontrolled emission rate of 1,000 pounds per day or 100 tons per year of volatile organic compounds.

§2105.12.a (Volatile Organic Compound Storage Tanks): The requirements of §2105.12.a for Volatile Organic Compound Storage Tanks are not applicable to the storage tanks collectively identified as T001. Although one of the storage tanks identified as T001 is greater than 2,000 gallons and No. 2 fuel oil is classified as a volatile organic liquid; the fuel oil has a maximum vapor pressure of 0.008 psia which is less than the vapor pressure threshold defined in §2105.12.a.

2. **Testing Requirements:**

- (a) Installation Permit #0678-I001, issued May 4, 2004, required that the permittee conduct performance tests on boilers B48-1 through B48-3 at least once every two years after the initial performance test, to determine compliance with the carbon monoxide and nitrogen oxide emission limitations specified in IP#0678-I001 for each boiler. These testing requirements are specified in the permit.
- (b) Installation Permit #0678-I002, issued April 14, 2008, required that the permittee conduct performance tests on boilers B48-4 through B48-6 at least once every two years after the initial performance test, to determine compliance with the carbon monoxide and nitrogen oxide emission limitations specified in IP#0678-I002 for each boiler. These testing requirements are specified in the permit.
- (c) Installation Permit #0647-I001, issued April 5, 2011, required that the permittee conduct an annual performance test on emergency generators DG56 through DG63 to determine compliance with PM, CO, NMHC and NO_x emission limitations specified in IP#0647-I001 for each boiler. These testing requirements are specified in the permit.
- (d) Testing is not required for the other emission units at this source. However, the Department reserves the right to require testing in the future to assure compliance with the terms and conditions of Title V Operating Permit No. 0647.

3. **New Source Performance Standards (NSPS):**

40 CFR 60, Subpart Db for Industrial-Commercial-Institutional Steam Generating Units:

- (a) Boilers B1 - B47, and B49A - B56B either commenced construction prior to June 19, 1984, or commenced construction after June 19, 1984 and each have a heat input capacity from fuels combusted in the steam generating unit of less than 100 million British thermal units per hour (MMBtu/hr). Therefore, the requirements of 40 CFR 60, Subpart

Db do not apply to these boilers.

- (b) Boilers B48-1 through B48-6 commenced construction after June 19, 1984 and each have a heat input capacity from fuels combusted in the steam generating unit greater than 100 million British thermal units per hour (MMBtu/hr). . Therefore, boilers B48-1 through B48-6 are subject to the requirements of 40 CFR 60.

40 CFR 60, Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units:

- (a) Boilers B1 - B47, and B49A - B56B either commenced construction prior to June 9, 1989, or each have a heat input capacity from fuels combusted in the steam generating unit of less than 10 million British thermal units per hour (MMBtu/hr). Therefore, the requirements of 40 CFR 60, Subpart Dc do not apply to these boilers.
- (b) Boilers B48-1 through B48-6 commenced construction after June 9, 1989 but do not have a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h).Therefore, the requirements of 40 CFR 60, Subpart Dc do not apply to these boilers.

40 CFR Part 60, Subpart JJJJ for Stationary Spark Ignition Internal Combustion Engines: The natural gas-fired emergency generators (spark ignition internal combustion engines) at this source commenced modification or reconstruction prior to June 12, 2006, and have not been modified or reconstructed since that time. Therefore, the rule does not apply.

40 CFR Part 60, Subpart IIII for Compression Ignition Internal Combustion Engines:

- (a) The diesel fuel-fired emergency generators identified as DG1 - DG32, DG33-1, and DG34 - DG54 are compression ignition internal combustion engines. These engines commenced construction prior to July 11, 2005, and have not been modified or reconstructed since that time. Therefore, the rule does not apply.
- (b) The diesel fuel-fired emergency generators identified as DG33-2 and DG56 – DG74 are subject to 40 CFR Part 60, Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. The dates the generators were ordered is after the date April 1, 2006 at §60.4200(a)(2)(i) making the installation subject to 40 CFR Part 60, Subpart IIII. All of the generators have a displacement of <30 L per cylinder.

4. **NESHAP and MACT Standards:**

40 CFR 63, Subpart KK for the Printing and Publishing Industry:

Process PP1 is not subject to the requirements of 40 CFR 63, Subpart KK as it is a minor source of HAPs.

40 CFR 63, Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines:

- (a) The emergency generators identified as DG1 - DG32, DG33-1, and DG34 - DG54 are existing emergency generators because they commenced construction before June 12, 2006. The source is a minor source of HAPs. Therefore, the existing emergency generators are not subject to the requirements of 40 CFR 63, Subpart ZZZZ and no initial notification is necessary.

- (b) The emergency generators identified as DG33-2 and DG56 – DG74 were ordered after the date June 12, 2006 making the generators subject to 40 CFR Part 63, Subpart ZZZZ §63.6590(c). The engines are located at an area source of HAPs, therefore the source will meet the requirements of 40 CFR, Subpart ZZZZ by meeting the requirements of 40 CFR Part 60, Subpart IIII. No further requirements apply to engines under this part.

40 CFR 63, Subpart JJJJJ for Industrial, Commercial, and Institutional Boilers Area Sources
 Pursuant to 40 CFR63.11193, natural gas boilers B48-1 through B48-6 use fuel oil as an emergency back-up fuel. The boilers are not exempt as specified in §63.11195. The boilers are an existing source having commenced construction or reconstruction prior to June 4, 2010. The boilers meet the criteria of oil subcategory using fuel oil as a back-up fuel for reasons other than periods of gas curtailment, gas supply emergencies or periodic testing not to exceed 48 hours during any consecutive 12-month period, located at an area source of HAPs and constructed on or before June 4, 2010 and are subject to this rule

5. **Risk Management Plan; CAA Section 112(r):**
 The source is not required to have a risk management plan at this time because none of the regulated chemicals exceed the thresholds on the regulation.
6. **Greenhouse Gas Reporting (40 CFR Part 98):**
 The facility is a major source of greenhouse gas (CO₂) emissions. However, the Greenhouse Gas (GHG) reporting rule under 40 CFR Part 98 are not considered applicable requirements under the Title V regulations at this time. Therefore, there are presently no greenhouse gas requirements at the facility.

METHOD OF DEMONSTRATING COMPLIANCE:

TVOP Section	Process	Method(s) of Demonstrating Compliance
V.A	Surface Coating and Printing (CP1, SP1, PP1, PLS1)	<ul style="list-style-type: none"> • Weekly inspections of process equipment • Recordkeeping of monthly consumption of each material used
V.B	Natural Gas-Fired Boilers, Space Heaters, and Water Heaters < 5 MMBtu/hr	<ul style="list-style-type: none"> • Recordkeeping of natural gas fuel use
V.C	Natural Gas-Fired Boilers 5 - 15 MMBtu/hr	<ul style="list-style-type: none"> • Recordkeeping of natural gas fuel use
V.D	Carrillo Street Boilers (B48-1, B48-2, B48-3, B48-4, B48-5, B48-6)	<ul style="list-style-type: none"> • Testing for CO and NOx every two years • One time test for PM • Boiler tune-up every other year • Recordkeeping of natural gas fuel use, fuel oil use, and biennial tune-ups
V.E	Diesel Generators (DG1– DG14, DG16– DG37, DG40–DG54, DG56 – DG71)	<ul style="list-style-type: none"> • 1 Testing for CO, and NOx on DG56- DG63 every five years • Recordkeeping of fuel consumption and hours of operation
V.F	Natural Gas Generators (NG-1, NG-6, NG-8, NG-17, NG-18)	<ul style="list-style-type: none"> • Recordkeeping of fuel consumption and hours of operation

See Title V Operating Permit No. 0647 for the specific conditions for determining compliance with the

applicable requirements.

RECOMMENDATION:

All applicable Federal, State and County regulations have been addressed in the permit application. The Title V Operating Permit application for the University of Pittsburgh, Campus should be approved with the emission limitations and terms and conditions in Title V Operating Permit No. 0647.