COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FIELD OPERATIONS - BUREAU OF AIR QUALITY

OPERATING PERMIT
(Revised 6/23/00)

In accordance with provisions of the Air Pollution Control Act, the act of January 8, 1960, P.L. 2119, as amended, and after due consideration of an application received under Chapter 127 of the Rules and Regulations of the Department of Environmental Protection, the Department hereby issues this permit for the operation of the ***Major NOx Emitting Facility and Major VOC Emitting*** Facility described below:

Permit No.	OP-46-0005	**Major Emitting Facility for**	Pharmaceutical Manufacturing Facility
Owner	Merck and Company, Inc.	**Air**	
Address	PO Box 4, WP 20-208 Sumneytown Pike	**Cleaning**	
	West Point, PA 19486-0004	**Device**	
Attention	Mr. Steven C. Wittmer	**Location**	Sumneytown Pike
	Director, Site Environmental Management		Upper Gwynedd Township
			Montgomery County

This permit is subject to the following conditions:

1. That the source(s) and any associated air cleaning devices are to be:

   a. operated in such a manner as not to cause air pollution;
   b. in compliance with the specifications and conditions of all applicable Plan Approvals issued;
   c. operated and maintained in a manner consistent with good operating and maintenance practices.

2. Failure to comply with the conditions placed on this permit is a violation of Section 127.444.

(SEE ADDITIONAL CONDITIONS ATTACHED)

Failure to comply with the conditions placed on this permit is a violation of Section 127.444. Violation of this or any other provision of Article III of the Rules and Regulations of the Department of Environmental Protection will result in suspension or revocation of this permit and/or prosecution under Section 9 of the Air Pollution Control Act.

Issued 01/13/97

Francine Carlini
Regional Manager
Air Quality

~~Expires 01/13/02~~

cc: Division of Permits, RCSOB
Administration
SEFO
Re (RN99)35-10

CONDITIONS (continued):

3. Operating Permit No. OP-46-0005 is issued to Merck and Company, Inc. (Merck) for the operation of Volatile Organic Compound (VOC)/Nitrogen Oxides (NO_x) emission sources regulated under 25 Pa. Code Sections 129.91-95. This permit specifies the company's Reasonably Available Control Technology (RACT) requirements for Sources of VOCs and NO_x. This Operating Permit incorporates Plan Approval bearing the No. PA-46-0005.

4. This permit establishes VOC/NOx RACT for Merck's West Point facility. For RACT purposes this permit covers the following facility sources located or which were located at Sumneytown Pike, in Upper Gwynedd Township, Montgomery County:

VOC Emission Sources

- Pharmaceutical Manufacturing
- Biological Manufacturing
- Graphic Services
- Research and Development
- Combustion Units
- Bulk Waste Transfer
- De-minimis sources

NO_x Emission Sources

A. Boilers:

Boilers	Manufacturer	Model	Capacity (MMBtu/hr)	Fuel	Control
Nos. 1 and 2	Combustion Engineering	VU-10	49.4 (each)	No. 2 Oil	
No. 3	Erie City	NB 16289	109.44 112.0	No. 2 Oil Natural Gas	LNB
No. 4	Babcock & Wilcox	FM-1759	118.4 122.4	No. 2 Oil Natural Gas	LNB
No. 5	Keeler	DS-10-20	93.4	No. 2 Oil Natural Gas	LNB
No. 6	Zern	1672	206	No. 2 Oil Natural Gas	LNB

CONDITIONS (continued):

B. Gas Turbine:

A co-generating combined cycle system with a rated heat input of 310.9 million Btu per hour on gas and 307.8 million Btu per hour on oil. A water injection system controls NOx emissions from the turbine.

C. Emergency Generators:

1. No. 2 Fuel Oil Fired Generators:

Nos.	Manufacturer	Model	Capacity (MMBtu/hr)	Operating Hours (hr/yr)
B1	Deere	6076AF010	1.5	100
B16-1	Detroit	16V 149T	12.4	312
B29-2	Cummins	KTA50G3	11.2	400
B29-1	Hercules	D300T	0.7	100
B33-1	GM EMD	A20C1	24.0	800
B33-2	Deere	6059TF001	0.9	100
B37-1	A/C	685T	1.3	100
B39	Cummins	NT855GS	2.5	100
B45-1	Detroit	8812379171 2V92	6.3	100
B61-1	Cummins	NT855G	2.4	100

2. Liquefied Propane Gas Fired Generators

Source Nos.	Manufacturer	Model	Capacity (MMBtu/hr)	Operating Hours (hr/yr)
B20-1	HERCULES	G1600	0.9	100
B21-1	CHEVY	5.7L	0.3	100
B35-1	CONTINENTAL	Y112	0.2	100
B62-1	~~HERCULES~~	G3400	0.5	~~100~~

CONDITIONS (continued):

3. Natural Gas Fired Generators:

Source Nos.	Manufacturer	Model	Capacity (MMBtu/hr)	Operating Hours (hr/yr)
B1-2	ONAN	JB	0.1	100
B2-1	ONAN	JC	0.2	100
B24-1	FORD	LSG-8751-6005-A	1.1	100
B26-2	WAUKESHA	180GKB	0.3	100
B26A-1	HERC	G2300	0.4	100
B28-1	IH	UV549-H	0.9	100
B38-1	HERCULES	G2300	0.4	100
B38-2	WISCONSIN	VG4D	0.3	100
B38-3	HERCULES	G2300	0.4	100
B38-4	FORD	CSG-6491-6005-A	0.5	100
B42-1	KOHLER	K331	0.1	100
B44-3	CUMMINS	G855	1.8	100
B44-2	CONTINENTAL	Y112	0.1	100
B46	CATERPILLAR	3412S1	3.6	100
B53A-1	CUMMINS	GTA855-B	3.6	100
B56-1	ONAN	JC	0.2	100
B65-1	CUMMINS	CV12-525-1PG	2.5	100
B71-1	CUMMINS	GTA 12	2.0	100
B77-1	ONAN	7.5JB	0.1	100
B78-1	CATERPILLAR	3516	8.0	400
B69-1	IH	UV549	1.1	100
B44-1	HERCULES	G2300	0.4	100

D. Incinerator:

Rotary Kiln Incinerator (RKI), McNaughlin Incinerators, Model R180 rated at 1,800 pounds of waste per hour, equipped with low NOx burners, (Eclipse), and a target tray wet scrubber, (Valaika, Inc.).

5. Pharmaceutical Manufacturing

A. Source Description

Pharmaceutical Manufacturing includes Point and Fugitive sources of VOC emissions generated during the formulation of pharmaceuticals using solvents in Building 69, including the following:

CONDITIONS (continued):

Source	Rated Capacity (Pharmaceutical Powders)
POINT SOURCES	
Microwaver Dryer (MUG II)	1200 liters
2 Glatt Air Technique Columns	
WSG-120 (G1)	100 kg
GPCG-120 (G-2)	420 liters
2 Aeromatic/Worley Fluid Bed Dryers STS-100 (F-3, F-4)	66 cubic feet (each)
2 Aeromatic Fluid Bed Dryers (MUG I) T-7A (F-7, F-8)	450 kg (each)
2 Aeromatic Fluid Bed Dryers, T-7 (F-5, F-6)	800 liters (each)
10 Hot Pack Tray Dryers (D-1-D-10)	480 lbs (each)
FUGITIVE EMISSIONS	
Fugitive emissions occur during Pharmaceutical Manufacturing processes including: Solution Preparation Processing Product Transfer Traying Operations	

B. Control Technology

VOC emissions from the point sources in Condition 5.A. and from selected traying operations shall be controlled by the following control equipment:

1. Traying Area Local Ventilation Systems (TALVS), which are designed to capture fugitive emissions from selected traying operations with a minimum of 40 percent efficiency.

2. Met Pro Catalytic Oxidizer with a minimum of 90 percent VOC destruction efficiency for this operation.

3. Mug II condenser, which is designed to control emissions from the microwave drying process with a minimum of 90 percent efficiency.

C. Emission Limitations

The total VOC emissions from the point sources in aggregate with fugitive emissions, as indicated in Condition 5.A. of the Operating Permit, shall be limited to the maximum of

CONDITIONS (continued):

~~100 lbs/hr, 1,000 lbs/day and 50 tons/yr as a 12-month rolling sum, calculated monthly. The hourly and daily emission limits shall be averaged over the batch cycle time.~~

D. Operating and Monitoring Requirements

1. ~~The company shall limit the VOCs in the raw material to 1,000 pounds/hr average, 10,000 pounds /day average and 500 tons/yr as a 12-month rolling sum, calculated monthly. The Department may approve an increase in VOC throughput if the company can demonstrate a greater catalytic oxidizer destruction efficiency through a testing program approved by the Department.~~

2. VOC emissions from 19 point sources and up to three TALVS in Building 69, as per Condition 5.A. of the Operating Permit, shall be directed to the catalytic oxidizer, except as follows:

   - When any of the emission sources are processing products, which do not use VOC, based solvents.

   - For those products dried in MUG II for which the in line condenser has been selected as the VOC emissions control system

3. The exhaust gas inlet temperature to the catalyst shall be maintained at a minimum of 550°F.

4. The exhaust gas inlet to the oxidizer shall not exceed 42,000 acfm.

5. Reduction of the VOC emissions directed through the oxidizer shall be a minimum of 90 percent.

6. MUG II condenser shall operate at the following parameters:

   - Chilled fluid temperature: 7°C
   - Chilled fluid flow rate: 40 gpm

7. Reduction of the VOC emissions directed through the Mug II condenser shall be a minimum of 90 percent. The method to demonstrate compliance with this condition shall be acceptable to the Department.

8. Fugitive VOC emissions from selected traying operations shall be captured via traying area local ventilation systems (TALVs) with a minimum capture efficiency

CONDITIONS (continued):

of 40 percent. The captured emissions shall be directed to the oxidizer for VOC destruction.

9. The company shall use one of the following methods to monitor the condition of the catalytic oxidizer to assure compliance with Conditions 5.C. and 5.D.5. of the Operating Permit:

- Perform an annual analysis of the catalyst in the catalytic bed for signs of degradation, or
- Perform periodic VOC emission stack tests in accordance with a periodic testing program approved by the Department.

E. Interlocks

The company shall operate and maintain the following environmental catalytic oxidizer interlocks:

1. The PLC is programmed to lock out sources at the operator control panel so that flow will not exceed 42,000 cfm.

2. The main damper to the oxidizer will not open if the oxidizer system is not operating properly.

3. Catalyst high temperature alarm will shut down the oxidizer system.

4. Oxidizer will shut down if the maximum LEL is reached (50 percent).

F. Recordkeeping and Reporting Requirements

1. The company shall operate and maintain monitoring and recording equipment that continuously indicates the following:

a. Inlet gas temperature to the catalytic bed to demonstrate compliance with Condition 5.D.3

b. Air flow to the catalytic incinerator to demonstrate compliance with Condition 5.D.4

c. MUG II condenser parameters to demonstrate compliance with Condition 5.D.6:

CONDITIONS (continued):

- Chilled fluid temperature - maximum per batch
- Chilled fluid flow rate - minimum per batch

2. The company shall use the VOC computer tracking system to document compliance with Condition 5.C. of the permit. The system shall quantify fugitive and controlled emissions from all manufacturing sources in Building 69 by accounting for all VOC solvents used in each batch of pharmaceutical formulation processed.

3. The tracking system must be approved by the Department and shall include but not be limited to the following information:

- Product formulated
- Pounds of solvent per batch (lbs/batch)
- Number of production runs per day (runs/day)
- Duration of each run (time/run)
- Pounds of solvent per batch emitted as fugitive

4. The company shall produce a quarterly report of the VOC emission summary generated from the tracking system. The report shall detail maximum average hourly, total average daily and total tons of VOC emitted per year, expressed as a 12-month rolling total, and shall be made available to the Department upon request.

5. Emission calculation

The computer tracking system shall calculate total VOC emissions per batch as follows:

Fugitive Emissions	+	Controlled Emissions	=	Total VOC Emissions
[Fugitive factor (%) x solvent/batch]	+	[(1-fugitive factor) x solvent/batch] x (1-control efficiency)]	=	Total emissions per batch of formulation

The Fugitive factor for each granulated product class shall be determined based on Attachment 9 of June 14, 1994 letter to Mr. Thomas T. McGinley, PA DEP from Mr. B. Fox, Merck (Appendix B) or a method approved by the Department. The fugitive factor for each coating batch shall be determined through a one-time mass balance study conducted during product development.

CONDITIONS (continued):

6. Records required under this permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

6. Biological Manufacturing

A. Source Description

Biological Manufacturing includes the following sources of emissions: shell freezers and area emissions:

1. Nine (9) shell freezers are tank-like refrigeration units that contain a cooled denatured alcohol bath.

2. Area emissions are generated during aseptic disinfection procedures using a solvent based solution.

B. Control Technology

VOC emissions from the shell freezers shall be controlled by the following:

- Liquid nitrogen cooling coils installed in all but one of the freezers
- Access doors fitted with gaskets to seal the vessel when not in use

C. Emission Limitations

1. The company shall limit VOC emissions from the shell freezers to the following maximums:

Shell Freezers	VOC Emission Limits as a 12-Month Rolling Sum Calculated Monthly
4 Units, Pre-1991	2.7 tpy
5 Units, Post-1991	2.6 tpy
Total	5.3 tpy

CONDITIONS (continued):

2. Merck shall limit area emissions from the source to the following maximums:

Area Emissions	VOC Emission Limits as a 12-Month Rolling Sum Calculated Monthly
Pre-1991	14.0 TPY
Post-1991	8.9 TPY
Total	**22.9 TPY**

3. Post-1991 freezer VOC emissions (2.6 tpy) and area VOC emissions (8.9 tpy) shall be counted as net emission increases towards New Source Review (NSR) applicability requirements.

D. Operating and Recordkeeping Requirements

1. Exhaust fans shall pull alcohol vapors from the shell freezers only when access doors are open.

2. The sources shall be operated and maintained in accordance with good air pollution control practices. The practices shall include, but not be limited to the following:

   a. Good housekeeping procedures for storage, use, and disposal of solvents.

   b. Employee training detailing good work practices to control solvent usage for minimizing emissions.

   c. Periodic inspection of production and cleaning activities.

   d. Solvent containers shall be closed when not in use.

3. The company shall, on a monthly basis, maintain records of the amounts of alcohol used in disinfecting and shell freezing. Recorded data shall be used to calculate emissions from the sources to demonstrate compliance with total allowable emissions in Conditions 6.C.1 and 6.C.2.

4. Records required under this permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

CONDITIONS (continued):

7. Graphic Services

A. Source Description

This source consists of six printing presses using non-heatset ink, varnishes and coatings, and adhesive operations as follows:

- Two (2) sheet-fed offset Heidelberg lithographic presses Nos. 86 and 84 with six and four-color stations, respectively.
- Two (2) web-fed Webtron flexographic presses Nos. 88 and 89 with six and five color units, respectively.
- One (1) sheet-fed offset Heidelberg GTO lithographic press No. 2 with two color stations.
- One (1) web-fed offset Muller Martini lithographic press No. 87 with two color stations.
- Adhesive operations, which consist of automatic gluing systems.

B. Control Technology

1. Merck shall maintain the as-applied VOC content of the fountain solution on the No. 87 press at or below 5.0 percent, by weight, and use no alcohol in the fountain solution.

2. Merck shall maintain the as-applied VOC content of the fountain solution on the No. 2, No. 84 and No. 86 presses:

a. at or below 5.0 percent, by weight;

or

b. at or below 8.5 percent, by weight, and refrigerate the fountain solution to 60°F or less.

CONDITIONS (continued):

3. The blanket and ink roller cleaning solutions used on all offset lithographic printing presses (Nos. 2, 84, 86, and 87) shall meet one of the following requirements:

   a. the VOC content (as used) shall be less than or equal to 30 percent, by weight;

   or

   b. the VOC composite partial vapor pressure (as used) shall be less than or equal to 10 mm Hg at 20°C.

4. Cleaning towels shall be placed in closed containers immediately after use.

~~C.~~ Emission Limitations

The company shall limit VOC emissions from the source (in aggregate) described in Condition 7.A. to a maximum of 7.5 tons per year as a 12-month rolling sum calculated monthly.

D. Operating and Recordkeeping Requirements

1. The sources shall be operated and maintained in accordance with good air pollution control practices.

2. ~~The company~~ shall maintain a record of monthly inventories of the solvents, in order to demonstrate compliance ~~with Condition 7.C.~~

3. Records required under this permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

8. Research and Development

A. VOC emissions from research and development activities include emissions from bench-scale laboratory activities, bioprocess development equipment and pharmaceutical development equipment.

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CONDITIONS (continued):

B. The Company shall limit VOC emissions from the source to the following maximums:

Source	VOC Emission Limits as a 12-Month Rolling Sum Calculated Monthly
Research laboratory activities	7.0 TPY
Pilot Equipment - Pharmaceutical Research and Development	2.0 TPY
Pilot Equipment - Bioprocess Research	1.0 TPY
Total	**10.0 TPY**

C. The Company shall provide training in responsible environmental laboratory practices in order to promote emission reduction.

D. The Company shall maintain and use records of solvent inventories and emission factors to calculate a 12-month rolling sum of annual VOC emissions.

E. The sources shall be operated and maintained in accordance with good air pollution control practices.

F. Records required under this permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

9. Combustion Sources

A. The sources include: Gas Turbine, B-33 Emergency Generator, Rotary Kiln Incinerator, Boilers 1-6, and Emergency Generators.

B. The VOC emissions from the above combustion sources covered under this Permit shall be limited to the maximum of 12.3 tons per year as a 12-month rolling sum calculated monthly.

C. The sources shall be operated and maintained in accordance with good air pollution control practices. Manufacturers specifications for maintenance and operation (and records of repair and maintenance) shall be made available to the Department upon request.

D. The Company shall perform all the calculations necessary to demonstrate compliance with the applicable requirements and make it available to the Department upon request.

CONDITIONS (continued):

E. Records required under this permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

10. Bulk Waste Transfer

A. This source consists of solvent transfer operations conducted in Building 5 of Merck's West Point facility. VOC emissions are generated during transfer of solvent waste from storage containers to tanker trucks.

B. ~~VOC emissions generated from this source and its intermittent operation shall be limited to the maximum of 15 lbs/hr and 0.6 tpy as a 12-month rolling sum, calculated monthly~~ whichever is more stringent.

C. The Company shall maintain the following records to demonstrate compliance with Condition 10.A.:

- Number of batches per year
- Duration of each batch, and
- Estimated pounds of VOC emitted per batch.

D. The source shall be operated and maintained in accordance with good air pollution control practices.

E. Records required under this Operating Permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

F. ~~VOC emissions (0.6 tpy) shall be counted as a net emission increase towards New Source~~ Review (NSR) applicability requirements.

CONDITIONS (continued):

11. De-Minimis VOC Emission Sources

A. The following de-minimis sources shall be operated with VOC emission rates of no greater than 3 pounds per hour, 15 pounds per day and 2.7 tons per year whichever is more stringent:

Source	Location
Merck Environmental Laboratory	B20
Camera Platemaker 550	B01 Dept. 955
Film Processor (2)	B01 Dept. 268
Offset Press AB Dick 98-40	B01 Dept. 955
Paint Shop	B01 Dept. 259
Blackstart Air Compressor	B02 Dept. 271
Diesel Fire Pump	B06 Dept. 274
Biological Process Vents	Site
Quality Control Labs-Bio	B28 Dept. 223
Compress/Encap Clean-up	B38 Dept. 101
Fluids Manufacturing	B38 Dept. 110
Plastic Bottle Manufacturing	B38 Dept. 112
Source	Location
* Stereo Lithography Apparatus	B38 Dept. 185
Quality Control Labs-Pharm.	B38 Dept. 160
* Film Processor	B39 Dept. 908
* Parts Washer	B44 Dept. 259
Maintenance Hoods	B44 Dept. 259
Material Supply Sample	B62 Dept. 177
Pharmaceutical Tablet Printer	B69 Dept. 163
Alcohol Storage Tanks (2)	B69 Dept. 292
* In-Situ Volatilization	Site Dept. 137
Wastewater E-Tank	Site Dept. 252
No. 2 Fuel Oil Tanks (2)	Site Dept. 271
Gasoline Fuel Tanks (2)	Site Dept. 253
Diesel Fuel Tank (1)	Site Dept. 253
Cooling Towers	Site Dept. 271

* Source has been permanently shutdown.

B. The sources shall be operated and maintained in accordance with good air pollution control practices.

CONDITIONS (continued):

~~C. The Company shall review activities annually and perform calculations as necessary to demonstrate compliance with Condition 11.A~~

D. Records required under this Operating Permit shall be kept for a period of five (5) years and shall be made available to the Department upon request.

12. Operating Requirements for Boilers No. 1 and No. 2:

A. The Company shall properly maintain the boilers by following the steps listed below:

1. The Company shall conduct an annual adjustment or tune-up on the combustion unit. This adjustment shall include, but not limited to the following:

i. Inspection, adjustment, cleaning or replacement of fuel-burning equipment, including the burners and moving parts necessary for proper operation as specified by the manufacturer.

ii. Inspection of the flame pattern or characteristics and adjustments necessary to ensure proper calibration and operation as specified by the manufacturer.

iii. Inspection of the air-to-fuel ratio control system and adjustments necessary to ensure proper calibration and operation as specified by the manufacturer.

2. The company shall record each adjustment conducted under the procedures in paragraph (A) in a method approved by the Department. This log shall contain, at a minimum, the following information:

i. The date of the tuning procedure.

ii. The name of the service company and technicians.

iii. The final operating rate or load.

iv. The final CO and NOx emission rates.

v. The final excess oxygen rate.

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CONDITIONS (continued):

vi. Other information, which may be required in the subsequent operation permit.

B. The operation of the boilers shall not result in the emission of:

1. Visible emissions in excess of the limitations specified in 25 Pa. Code Section 123.41 as follows:

i. equal to or greater than 20 percent for a period or periods aggregating more than three minutes in any one hour.

ii. equal to or greater than 60 percent.

2. Particulate matter in excess of the limitations specified in 25 Pa. Code Section 123.11(a)(1).

4. Sulfur oxides in excess of the limitations specified in 25 Pa. Code Section 123.22(e)(2): the sulfur content of No. 2 oil shall not exceed 0.3 percent (by weight).

C. The Company shall maintain the following certifications in accordance with 25 Pa. Code 129.93(b)(4):

1. A certification from fuel supplier of the type of fuel and each shipment of the fuel;

2. A certification that the fuel complies with ASTM D396-78 "Standard Specifications for Fuel Oils."

13. Requirements for Boilers No. 3 and No. 5:

The operation of each boiler shall not result in the emissions of:

A. Visible emissions in excess of the limitations specified in 25 Pa. Code Section 123.41 as follows:

a. equal to or greater than 20 percent for a period or periods aggregating more than three minutes in any one hour.

b. equal to or greater than 60 percent.

CONDITIONS (continued):

B. Particulate matter in excess of the limitations specified in 25 Pa. Code Section 123.11(a)(2).

C. Sulfur oxides in excess of the limitations specified in 25 Pa. Code Section 123.22(e)(2): The sulfur content of No. 2 oil shall not exceed 0.3 percent (by weight).

D. Nitrogen Oxides (NO_x) in excess of:

Boiler No. 3	0.15 lb/MMBtu	98 tons as a 12-month rolling sum
Boiler No. 5	0.20 lb/MMBtu	82 tons as a 12-month rolling sum

14. Requirements for Boiler No. 4:

A. The operation of the boiler shall not result in the emissions of:

1. Visible emissions in excess of the limitations specified in 25 Pa. Code Section 123.41 as follows:

i. equal to or greater than 20 percent for a period or periods aggregating more than three minutes in any one hour.

ii. equal to or greater than 60 percent.

2. Particulate matter in excess of the limitations specified in 25 Pa. Code Section 123.11(a)(2).

3. Sulfur oxides in excess of 232.5 tons per year or the limitations specified in 25 Pa. Code Section 123.22(e)(2): The sulfur content of No. 2 oil shall not exceed 0.3 percent (by weight), whichever is more stringent.

4. Nitrogen oxides in excess of 226 tons per year as a 12-month rolling sum calculated monthly.

B. The boiler is subject to the emission limitations of the New Source Performance Standards, 40 C.F.R. 60, Subpart Db and shall comply with all applicable requirements of this Subpart. The operation of the boiler shall not result in the emission of:

1. Visible emissions in excess of 20 percent opacity at any six-minute average per hour, except for one 6-minute period per hour of not more than 27 percent opacity in accordance with 40 C.F.R. Sections 60.43b(f) and 60.46b(a), or the limitations as described in Condition A above, whichever is more stringent.

CONDITIONS (continued):

2. Sulfur dioxide in excess of the limitations specified in 40 C.F.R. Section 60.42b, or the limitations as described in Condition A above, whichever is more stringent.

3. Nitrogen oxides in excess of the limitations specified in 40 C.F.R. Section 60.44b (a)(1) 0.20 lb/million Btu of high heat release rate and Section 60.46b(a), or the limitations as described in Condition A above, whichever is more stringent.

C. Monitoring Requirements:

The continuous emission monitoring system for opacity and nitrogen oxides as previously approved by the Department, must be operated and maintained in accordance with the quality assurance, record keeping and reporting requirements of Chapter 139 of the Pennsylvania Department Protection's Rule and Regulations and the Department's Continuous Source Monitoring Manual and 40 C.F.R. Section 60.48b. The required data reports shall be submitted to the Department's Central Office, in hardcopy and computer readable-media formats as specified by the Department, within thirty (30) days following the close of each calendar quarter.

D. Reporting and Recordkeeping Requirements:

1. The company shall comply with the standard of sulfur dioxide by maintaining fuel receipts from the fuel supplier in accordance with 40 C.F.R. 60.42b(j)(2), 60.45b(j), 60.47b(f), and 60.49b(r).

2. The company shall comply with the requirements of recording and recordkeeping in accordance with 40 C.F.R. 60.49b.

3. 40 C.F.R. requires submission of copies of all requests, reports, applications, submittals, and other communications to both EPA and the Department. The EPA copies shall be forwarded to:

Director
Air Protection Division
U.S. EPA, Region III
1650 Arch Street
Philadelphia, PA 19103

CONDITIONS (continued):

15. Requirements for the Gas Turbine and Boiler No. 6:

The co-generating combined cycle system consists of a gas/oil fired turbine and boiler No. 6 fired by duct burners while the gas turbine is not operating. A water injection system controls the NO_x emissions from the gas turbine and the boiler is equipped with a low-NO_x burner. Conditions 15.A. through 15.E. are the RACT requirements for the Gas Turbine and Boiler No. 6. Condition 15.F. supersedes Conditions 15.A.2, 15.C and 15.D.1.

A. Operating Requirements:

1. The turbine and the duct burner shall not be fired at the same time, except one hour in duration for startup and shutdown combined.

2. The following minimum water to fuel ratios shall be maintained when the turbine is operating at base and peak loads:

Fuel	Base Load	Peak Load
Gas	0.55	0.61
Oil	0.93	0.91

B. Emission Limitations for the Boiler:

1. The operation of the boiler shall not result in the emissions of:

i. Visible emissions in excess of the limitations specified in 25 Pa. Code Section 123.41 as follows:

a. equal to or greater than 20 percent for a period or periods aggregating more than three minutes in any one hour.

b. equal to or greater than 60 percent.

ii. Particulate matter in excess of the limitations specified in 25 Pa. Code Section 123.11(a)(2).

iii. Sulfur oxides in excess of the limitations specified in Condition A above.

CONDITIONS (continued):

2. The boiler fired by duct burner used in a combined cycle system is subject to the emission limitations of the New Source Performance Standard, 40 C.F.R. 60, Subpart Db. The operation of the boiler shall not result in the emissions of:

   i. Nitrogen oxides (expressed as NO_2) in excess of 0.20 pounds per million Btu of heat input in accordance with 40 C.F.R. Sections 60.44b(a)(4) and 60.46b(a).

   ii. Visible emissions in excess of 20 percent opacity at any six-minute average per one hour, except for one 6-minute period per hour of not more than 27 percent opacity in accordance with 40 C.F.R. Sections 60.43b(f) and 60.46b(a), or the limitations as described in Condition 15.B.1.i above, whichever is more stringent.

   iii. Sulfur dioxide in excess of the limitations specified in 40 C.F.R. Section 60.42b, or the limitations as described in Condition 15.A.1 above, whichever is more stringent.

C. Emission limitations for the Turbine:

1. The operation of the gas turbine shall not result in the emissions of:

   i. Visible emissions in excess of the limitations specified in 25 Pa. Code Section 123.41 as follows:

      a. equal to or greater than 20 percent for a period or periods aggregating more than three minutes in any one hour.

      b. equal to or greater than 60 percent.

   ii. Sulfur oxides in excess of 500 parts per million, by volume, dry basis, specified in 25 Pa. Code Section 123.21, or the limitations specified in Condition 15.A.1 above, whichever is more stringent.

   iii. Nitrogen oxides concentration in excess of 42 parts per million by volume corrected to 15 percent O_2 and on a dry basis.

CONDITIONS (continued):

2. The gas turbine is subject to the emission limitations of the New Source Performance Standard, 40 C.F.R. 60, Subpart GG. The operation of the turbine shall not result in the emissions of:

   i. Nitrogen oxides in excess of the limitations specified in 40 C.F.R. Section 60.332, or the limitations as described in Condition 15.C.1.iii above, whichever is more stringent.

   ii. Sulfur oxides in the turbine in excess of the limitations specified in 40 C.F.R. 60.333, or the limitations as described in Conditions 15.A.1 and 15.C.1.ii above, whichever is more stringent.

D. Monitoring Requirements:

1. The company shall monitor and record the operating hours when the source is burning No. 2 fuel oil.

2. The company shall operate and maintain a continuous monitoring system on the boiler to measure the opacity of emissions from the boiler and record the output of the system in accordance with 40 C.F.R. Section 60.48b(a).

3. The company shall operate and maintain a continuous monitoring system on the gas turbine to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine in accordance with 40 C.F.R. 60 Subpart GG, Section 60.334(a).

4. The company shall monitor the sulfur content and nitrogen content of the fuel being fired in the gas turbine in accordance with 40 C.F.R. 60, Subpart GG, Section 60.334(b).

5. The company shall maintain and operate a continuous monitoring system on the boiler for measuring nitrogen oxides emissions discharged to the atmosphere and record the output of the system.

6. The continuous emission monitoring system specified above as previously approved by the Department, must be operated and maintained in accordance with the quality assurance, record keeping and reporting requirements of Chapter 139 of the Pennsylvania Department Resources' Rule and Regulations and the Department's Continuous Source Monitoring Manual and 40 C.F.R. Section 60.48b. The required data reports shall be submitted to the Department's Central

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CONDITIONS (continued):

Office, in hardcopy and computer readable-media formats as specified by the Department, within thirty (30) days following the close of each calendar quarter.

E. Reporting and Recordkeeping Requirements:

1. The company shall comply with the standard of sulfur dioxide for the boiler by maintaining fuel receipts from the fuel supplier in accordance with 40 C.F.R. 60.42b(j)(2), 60.45b(j), 60.47b(f), and 60.49b(r).

2. The company shall comply with the requirements of recording and recordkeeping for the boiler in accordance with 40 C.F.R. 60.49b.

3. The company shall submit to the Department excess emission reports for the gas turbine in accordance with the regulations under 40 C.F.R. 60, Subpart GG, Section 60.334(c) for nitrogen oxides and sulfur dioxide.

4. 40 C.F.R. Subpart GG requires submission of copies of all requests, reports, applications, submittals, and other communications to both EPA and the Department. The EPA copies shall be forwarded to:

Director
Air Protection Division
U.S. EPA, Region III
1650 Arch Street
Philadelphia, PA 19103

F. The following conditions apply to the Gas Turbine and is not a determination of RACT. The following conditions are a determination of BAT for the Gas Turbine. This Operating Permit consolidates all Plan Approval(s) bearing the No. PA-46-0005C.

1. This Operating Permit OP-46-0005, is issued to Merck and Company, Inc., to increase the maximum firing rate of the Gas Turbine, a cogeneration combustion turbine. The Gas Turbine was manufactured by General Electric, model number PG5371, with a peak rating of 35,260 KVA, and is located on Merck and Company, Inc., property, Upper Gwynedd Township, Montgomery County.

2. Operational Limitations

i. The Gas Turbine shall not be limited in its hours of operation.

CONDITIONS (continued):

ii. The Gas Turbine shall be limited to firing natural gas and No. 2 fuel oil.

iii. The company shall limit the amount of No. 2 fuel oil combusted in the Gas Turbine to a maximum of 1.6 million gallons in a 12-month rolling period.

iv. The sulfur content of the No. 2 fuel oil fired in the Gas Turbine shall not, at any time, exceed 0.2 percent by weight. The company shall, upon Department request, provide fuel analyses, or fuel samples, of the No. 2 fuel oil used in the Gas Turbine.

3. Emission Limitations

i. The following air contaminant emission limits are approved for the Gas Turbine:

a) Particulate Matter (PM): 63 tons per year;

b) Oxides of Nitrogen (NOx): 236.3 tons per year;

c) Carbon Monoxide (CO): 418.5 tons per year; and,

d) Sulfur Oxides (SOx): 23.5 tons per year.

ii. The Gas Turbine shall comply with provisions contained in 25 Pa. Code Section 123.31(b).

iii. The Gas Turbine shall comply with provisions contained in 25 Pa. Code Section 123.41.

4. Monitoring Requirements

i. The company shall monitor, on a continuous basis, the amount of natural gas and No. 2 fuel oil combusted in the Gas Turbine.

5. Recordkeeping Requirements

Sufficient data shall be recorded, in a format approved by the Department, so that compliance with the conditions in this Operating Permit can be determined. Records shall be kept for a minimum of five (5) years and shall be made available to the Department upon request.