COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR

TITLE V FINAL OPERATING PERMIT
AIR QUALITY AREA
ENVIRONMENTAL QUALITY BOARD

Permit Number:	**TV-2834-47-0297-0003**
Operating Permit application received:	**February 3, 1997**
Effective Date:	**December 12, 2005**
Expiration Date:	**December 12, 2010**

In accordance with the provisions of Part VI of the Regulation for the Control of Atmospheric Pollution (RCAP) and the provisions of 40 CFR part 70,

SCHERING- PLOUGH PRODUCTS, L.L.C, MANATI OPERATIONS
MANATÍ, PUERTO RICO

hereinafter referred to as **Schering** or the permittee, is authorized to operate a stationary source of air contaminants limited to the units and conditions described in this permit. Until such time as this permit expires or is modified or revoked, the Permittee is allowed to discharge air pollutants from those activities directly related to or associated with the sources, in accordance with the limitations and conditions of this permit.

All conditions in this permit are federally enforceable and state enforceable. Requirements that are only state enforceable are identified as such in the permit. A copy of this permit must be kept on-site at the above named facility at all times.

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Section I- General Information

A. Facility Information

Company Name: **Schering- Plough Products, L.L.C., Manatí Operations**

Postal Address: **P.O. Box 486**

City: **Manatí** State: **P.R.** Zip Code: **00674**

Facility Name: **Schering- Plough Products, L.L.C, Manatí Operations**

Facility Location: **Carr 686 km 0.5 Manatí, P.R 00674**

Responsible Official: **Ricardo Zayas**
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Primary SIC Code: **2834**

B. Process Description

Schering Plough Products, L.L.C Manatí Operations is a corporation engaged in the manufacture of pharmaceutical products, steroids and final product. For this purpose Schering operates two product plants (Steroids and Netilmicin) one pharmaceutical plant, three boilers and one tank field.

The contaminants emitted by Schering are due primarily to the chemical operations performed in the manufacture of products. These emissions are associated to the productions steps, the operation of the boilers and the storage tanks, among others.

Section II - Emission Units Description

The emission units, and their corresponding control equipment, regulated under this permit are the following:

Emission Unit	Equipment Configuration Description	Control Equipment
EC-001	An evaporator that receives the batch in solution from the Fermentation Plant, concentrated using two propellers under pressure. The vapors are condensed by condenser and sent to a hotwell and then to the Fermentation Plant. The distillate is received in a receiving tank and then returned to the Fermentation Plant. The concentrated batch in the evaporator is transferred to two storage tanks. Then, the batch is transferred to the reactor where a solvent is added. The vapors are condensed by a condenser, which is connected to receiving tank (2) where the condensate is collected before it is sent to the Fermentation Plant. The batch is cooled down and filtered by centrifuge. It is sent to the receiving tank for final disposal. The refluxed solvents are discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-002	A tank that feeds the reactor (1) where the first and second reaction occur. The pH is adjusted. A series of extractions and separations are performed using a separation bottle and one or two storage tanks. The organic layer is transferred to another reactor (2) where it is concentrated under vacuum. The vapors are condensed by condenser and sent to the distillate tank before disposal. Another solvent is added. The vapors are condensed. The batch is precipitated and isolated by centrifuge. The filtrate is sent to a receiving tank before disposal. The refluxed solvents are discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-003	A fluid bed dryer where the wet product is dried out and the particulate is removed in the dust extractor.	CD-631-3625, CD-631-3626 and CD-631-3627 to control PM emissions
EC-004	A tank that feeds the reactor where the reaction occurs. The batch in solution is precipitated in a precipitator and the product is isolated by centrifuge. The filtrate is sent to a filtrate-receiving tank before disposal. The refluxed solvent is discarded.	Scrubber CD-631-3402 with a 90% minimum efficiency for acids. Scrubber CD-631-3291 with a 90% minimum efficiency for acids

Emission Unit	Equipment Configuration Description	Control Equipment
EC-005	A tank that feeds the reactor where the reaction occurs. The distillation is generated by pump. The vapors are condensed by condenser. The distilled vapors are condensed by condenser and discharged into a receiving tank. The batch is cooled down and filtered by centrifuge and the filtrate is sent to the receiving tank. The filtrate is sent to the level tank before the process is carried out. The refluxed solvent is discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-006	The reaction is carried out in a reactor. The batch in solution is precipitated and isolated by centrifuge. The filtrate is sent to the receiving tank. The refluxed solvent is discarded.	Scrubber CD-631-3402 with a 90% minimum efficiency to control acid emissions.
EC-007	A reactor where the material is dissolved in a mixture of water and solvent. Then, it is separated using a separation bottle. The organic layer is bleached by a sparkler filter. The batch is transferred to the crystallizer where the volume per concentration is decreased. The vapors are condensed and sent to a distillate-receiving tank prior to disposal. When the desired volume is reached, the batch is cooled down and isolated by filtration using a centrifuge with a nutsche filter in series to collect all the material. The filtrate is kept in the nutsche filter until the batch yield is known and then it is discarded. The wet product is dried out in a dryer under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. During the cleaning process a solvent is refluxed for a period of time, then it is passed through some pieces of equipment and then it is discarded. The vapors are condensed by condensers.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-008	A reactor where the material is dissolved by refluxion in a water/solvent mixture. The mixture is separated using the separation bottle. The organic layer contained in the batch is bleached and clarified using a sparkler filter. The batch in solution is transferred to the crystallizer where the volume by concentration is decreased. The vapors are condensed and sent to a distillate-receiving tank prior to disposal. When the desired volume is reached, the batch is cooled down and isolated by filtration using a nutsche filter. The filtrate is kept in the nutsche filter until the batch yield is known and then it is discarded. The wet product is dried in a dryer under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. During the cleaning period a solvent is refluxed for a period of time, and then finally it is discarded. The vapors are condensed by condensers.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
EC-009	A tank that feeds the reactor where the reaction is brought about. The batch in solution is precipitated into another container (precipitator) and the product is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. During the cleaning process a solvent is refluxed for a period of time. The hot solvent is transferred into another tank (precipitator) and water is added. The mixture is stirred for a period of time before it is discarded. The vapors are condensed by condenser.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-010	A reactor where the material is dissolved and crystallized. The vapors generated are condensed by condenser and sent to the feeding tank.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-011	A reactor where the product is diluted in water. Then it is filtered by centrifuge. The filtrate is sent to the receiving tank prior to disposal. The slurry is sent to the dryer. The vapors are condensed. The refluxed solvent is discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions
EC-012	A reactor where the reaction is carried out. The mixture is refluxed. The vapors are condensed. The batch in solution is concentrated and the vapors are condensed and sent to the distillate-receiving tank. Water is added to precipitate the material and it is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a receiving tank prior to disposal. The wet product is dried in a dryer under vacuum generated by two steam propellers whose vapors are condensed and sent to a hotwell. The remaining solvent is discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-013	A reactor where the material is mixed with a solvent. The vapors are condensed. The batch is cooled down and filtered. It is sent to a filtrate-receiving tank. The product is dried out under vacuum generated by a steam propeller.	None
EC-014	A reactor where the reaction occurs. The vapors are condensed by condenser. Water is added to precipitate the material. The product is isolated by filtration. The product is dried by dryer under vacuum generated by two steam propellers whose vapors are condensed and sent to a hotwell. The refluxed solvent is discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions

Emission Unit	Equipment Configuration Description	Control Equipment
EC-015	A charge tank that feeds the reactor (1) where the main reaction is carried out. In the other reactor (2) a solution is prepared to be added to the reactor (1). The mixture is stirred, let stand, and separated. Each phase is sent to one of the three holding tanks available, through a separation bottle. After a series of extractions and separations the batch is transferred to the reactor (1), the pH is adjusted, and the batch is transferred to drums to be finally transferred to the reactor (3). In this reactor, the batch is bleached and clarified by a sparkler filter. The clarified batch is transferred to the crystallizer where it is crystallized, cooled down and isolated by a nutsche filter. The filtrate is sent to a holding tank prior to transfer back to the crystallizer where it is concentrated under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. The distillate is sent to a distillate-receiving tank, prior to disposal. The wet product is dried out under vacuum generated by two steam propellers whose vapors are condensed and sent to a hotwell. During the cleaning of the bay, a solvent is refluxed in two reactors and the crystallizer. The vapors are condensed by condensers and then discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-016	A charge tank that feeds the reactor where the reaction is carried out. After the reaction is completed, the batch is transferred to the crystallizer. The batch is concentrated under vacuum and the vapors are condensed and sent to a distillate-receiving tank. When the desired volume is reached, the batch is isolated by filtration using a centrifuge; the product is washed with water and then transferred to a dryer. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. In the dryer, the vacuum is generated by two steam propellers whose vapors are condensed by condensers and sent to a hotwell. During the cleaning process a solvent is refluxed for a period of time, then it is passed through some pieces of equipment and then it is discarded. The vapors are condensed by condensers.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions
EC-017	A reactor where the main reaction is brought about. The batch is then bleached and clarified using a sparkler filter. The batch in solution is transferred to a crystallizer where the material is concentrated under vacuum generated by a steam propeller. The vapors are condensed by condenser and then sent to a hotwell. The distillate is sent to a distillate-receiving tank prior to disposal. The batch is cooled down and filetred by pressure filter, the filtrate is sent to a receiving tank. The isolated product is dried in a dryer that uses two steam propellers to generate a vacuum. The vapors are condensed by condensers	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions

Emission Unit	Equipment Configuration Description	Control Equipment
	and sent to a hotwell. During the cleaning process, the solvent is refluxed for a period of time, and then it is passed through some pieces of equipment and discarded.	
EC-018	Charge tank that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The batch in solution is concentrated under vacuum generated by a steam propeller to remove the water and perform the third reaction. The vapors generated by the propellers are condensed and sent to a hotwell. The vapors generated during the concentration are condensed and the distillate is sent to a distillate-receiving tank prior to disposal. The pH of the solution is adjusted and it is washed. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum generated by a steam propeller. The vapors generated by the propellers are condensed and sent to a hotwell. The vapors generated during the concentration are condensed and sent to a distillate-receiving tank for recovery or disposal. When the desired volume is reached, another solvent is added through another charge tank (2). The batch is concentrated again and the suspension is cooled down to add another solvent to it through another charge tank (3). The product is isolated by filtration. The product is dried in a dryer, under vacuum generated by two steam propellers whose vapors are condensed by condensers and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-019	A charge tank (1) that feeds the reactor where the first and second reactions occur. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The batch in solution is concentrated under vacuum generated by a steam propeller to remove the water and perform the third reaction. The vapors generated by the propellers are condensed and sent to a hotwell. The vapors are generated during the concentration are condensed and the distillate is sent to a distillate receiving tank prior to disposal. The pH of the solution is adjusted and the batch in solution is transferred to the crystallizer where it is concentrated under vacuum generated by a steam propeller. The vapors generated by the propellers are condensed and sent to a hotwell. The vapors generated during the concentration are condensed by condenser and sent to a distillate-receiving tank for recovery or disposal. When the desired volume is reached, another solvent is added through another charge tank (2). It is concentrated again and the suspension is cooled down	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	to add another solvent to it through another charge tank (3). The product is isolated by filtration. The dryer uses a steam propeller, whose vapors are condensed and sent to a hotwell. The filtrate is sent to a receiving tank.	
EC-020	A charge tank that feeds the reactor where the main reaction occurs. After the main reaction is completed, the batch in solution is precipitated in a precipitator and separated by filtration. The product is washed and the filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. The product is transferred to a dryer where the vacuum is generated by two steam propellers whose vapors are condensed and sent to a hotwell. During the cleaning process a solvent is refluxed for a period of time. The hot solvent is transferred to another tank (usually the precipitator) where water is added. The mixture is stirred for a period of time before it is discarded. The vapors are condensed by condenser.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-021	A reactor where the product is dissolved and bleached. The clarification is obtained by recirculating the solution through a filter. The solution is transferred to a crystallizer where it is concentrated under vacuum. The vapors are condensed by condenser and the distillate is sent to a distillate-receiving tank before it is discarded through hazardous wastes. When the desired volume is reached, the suspension is cooled down and the material is isolated by filtration. The filtrate is kept in the filter or sent back to the crystallizer before it is discarded or transferred to secondary recovery drums. The wet material is sent to a dryer that uses a steam propeller to generate a vacuum and where the condensed vapors are sent to a hotwell. During the cleaning procedures, a solvent is refluxed for a period of time, passed through some pieces of equipment and then discarded. The vapors are condensed by condenser.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-022	A reactor where the product is dissolved and bleached. The clarification is obtained through recirculation using a filter. The solution is transferred to crystallizer where it is concentrated under vacuum. The vapors are condensed by condenser and the distillate is sent to a distillate-receiving tank before it is discarded through hazardous wastes. When the desired volume is reached, the mixture is cooled down and the material is isolated by filtration using a nutsche filter or it is sent back to the crystallizer before it is discarded or transferred, or transferred to secondary recovery drums. The wet material is sent to a dryer that uses two steam propellers to generate a vacuum. The condensed vapors are sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
EC-023	A reactor where the material is dissolved by refluxion in a solvent/water mixture. The batch in solution is then bleached and clarified by sparkler filter. The batch in solution is transferred to a crystallizer where the volume is reduced by concentration using vacuum. The vapors are condensed by condenser and the distillate is sent to a distillate-receiving tank prior to disposal through hazardous wastes. After the desired volume is reached, the batch is cooled down by centrifuge. The filtrate is sent to a filtrate-receiving tank before it is discarded through hazardous wastes or transferred to secondary recovery drums. The wet material is dried in a dryer under vacuum, where the vacuum is generated by two steam propellers whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-024	A reactor where the material is dissolved by refluxion in a water/solvent mixture. The batch in solution is bleached and clarified using a sparkler filter. The solution is then transferred to a crystallizer where the volume is reduced by concentration under vacuum. The vacuum is generated by a steam propeller whose vapors are condensed and sent to a hotwell. The vapors from distillation are condensed by condenser and sent to a distillate-receiving tank before they are discarded through hazardous wastes. When the desired volume is reached, the batch is cooled down and isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank before it is discarded through hazardous wastes. The wet material is dried by dryer under vacuum generated by the same steam propeller used in the concentration step. The vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-025	A charge tank that feeds the reactor (1) where the main reaction is carried out. The material is dissolved in another additional tank (reactor 2) before it is transferred to reactor (1). After the reaction is completed, the batch is precipitated and isolated by filtration using a centrifuge with a nutsche filter in series to collect all the product. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. A solvent is refluxed during the cleaning process and then the hot solvent is transferred to another tank and water is added.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-026	A charge tank that feeds the reactor where the main reaction is carried out. After the reaction is completed, it is precipitated in the precipitator and isolated by filtration using a centrifuge with a nutsche filter in series to collect all the product. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. A solvent is refluxed for a period of time. The hot solvent is transferred into another tank (usually the precipitator) where water is added. The mixture is stirred for a period of time and passed through some pieces of equipment	Carbon Adsorption Unit CD-631-3402 to control HAP and VOC emissions. Scrubber CD-631-3402 with a 90% minimum efficiency. (control acidic

Emission Unit	Equipment Configuration Description	Control Equipment
	prior to disposal. The vapors are condensed by condenser.	emissions)
EC-027	A reactor where the material is mixed with a solvent. If reflux occurs, the vapors are condensed by condenser. The resulting mixture is filtered by nutsche filter; the filtrate is collected in drums. The wet material is dried out under vacuum generated by two steam propellers whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-028	A reactor (1) where the material is dissolved by refluxion in a solvent. The refluxion vapors are condensed by condenser. A bleaching agent is added and the solution is clarified by sparkler filter. The batch in solution is transferred to another reactor (2) and then to the crystallizer where it is concentrated. The concentration vapors are condensed by condensers. The distillate is sent to a distillate-receiving tank before it is discarded. When the desired volume is reached, the suspension is cooled down and isolated by filtration using a nutsche filter. The wet material is dried out under vacuum by two steam propellers whose vapors are condensed by condenser and sent to a hotwell. The filtrate is transferred to drums for recovery.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-029	A reactor where the material is dissolved by refluxion in a water/solvent mixture. The pH is adjusted if necessary, and the mixture is separated using a separation bottle. The phases are transferred to one of two holding tanks. The organic phase (batch) is transferred to the crystallizer where it is concentrated under vacuum until the desired volume is reached. The vapors are condensed by condenser and the distillate is sent to a distillate-receiving tank. The resulting suspension is cooled down and isolated by filtration using a nutsche filter. The product is dried in a dryer under vacuum generated by two steam propellers whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-030	A reactor where the material is dissolved by refluxion in a solvent/water mixture. The refluxion vapors are condensed by condenser. If necessary, the pH is adjusted and the phases are separated using a separation bottle. The phases are transferred to one of two available holding tanks. The organic phase (the batch) is transferred to the crystallizer where it is concentrated under vacuum. The vapors are condensed by condenser and the distillate is sent to a distillate-receiving tank before it is discarded. When the desired volume is reached, the suspension is cooled down and the material is isolated using a nutsche filter. The filtrate is transferred to recovery drums.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-031	A reactor where the material is dissolved by refluxion. The vapors are condensed. The batch in solution is transferred to the crystallizer where it is concentrated. After condensation,	

Emission Unit	Equipment Configuration Description	Control Equipment
	the vapors are sent to the distillate-receiving tank prior to disposal. When the desired volume is reached, the suspension is cooled down and the material is isolated by filtration using a nutsche filter. The filtrate is subsequently transferred to material recovery drums. The product is dried out under vacuum generated by two steam propellers. The vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-032	A reactor where the reaction is performed. The solution is concentrated under vacuum generated by a steam propeller. The vapors are condensed and sent to a hotwell. The vapors are condensed and sent to a distillate-receiving tank. The resulting suspension is filtered and dried in a filter/dryer apparatus. The filtrate is sent to a filtrate-receiving tank prior to disposal. The filter/dryer apparatus uses a steam propeller and its condenser to generate the vacuum and control the vapors that are sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-033	Charge tank that feeds the reactor (1) where a complex is formed. The material is added to complete the reaction. The water contained in another reactor (2) is added. A series of separations and extractions are performed using a separation bottle and two holding tanks. The pH of the solution is adjusted with an acid solution prepared in another container and added through a charge tank. The phases are separated, and the organic phases join and are concentrated under vacuum in the reactor (1). The vapors are condensed by condenser and sent to a distillate-receiving tank prior to disposal. Another reagent is added before water is added to precipitate the material. The material is transferred to the precipitator that contains more water. The product is isolated by centrifuge, the filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-034	Charge tank that feeds the reactor (1) where a complex is formed. The material is added to complete the reaction. Then the material is added to complete the reaction. Then water that was contained in another reactor (2) is added. A series of separations and extractions are performed using a separation bottle and two holding tanks. The pH of the solution is adjusted with an acid solution prepared in another container and added through a charge tank. The phases are separated, and the organic phase is concentrated under vacuum in the reactor (1). The vapors are condensed by condenser and sent to a distillate-receiving tank prior to disposal. Another reagent is added before water is added to precipitate the material. The material is transferred to the precipitator that contains more water. The product is isolated using a nutsche filter, the filtrate is sent to a filtrate-receiving tank through a level tank prior to	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	disposal.	
EC-035	A reactor where the material is dissolved in a solvent using heat if necessary. The vapors are condensed by condenser. The batch in solution is charged into a column previously filled with bleaching material. The eluate is collected in a holding tank before it is transferred to the crystallizer. The batch is concentrated under vacuum and the solvent is replaced to crystallize the product. The vapors generated during the concentration are condensed by condenser. The vacuum is generated by a steam propeller, and the vapors are concentrated and sent to a hotwell. The distillate is sent to a distillate-receiving tank. The resulting suspension is cooled down and isolated using a nutsche filter. The wet material is transferred to a dryer where the vacuum is generated by two steam propellers. The vapors are condensed by condensers and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-036	A reactor where the material is dissolved in a solvent using heat if necessary. The vapors are condensed. The batch in solution is charged into a column previously filled with a bleaching material. The eluate is collected in a holding tank before it is transferred to the crystallizer. The batch is concentrated under vacuum and the solvent is replaced to crystallize the product. The vapors generated during the concentration are condensed by condenser. The vacuum is generated by a steam propeller and the vapors are condensed and sent to a hotwell. The distillate is sent to a receiving tank. The suspension is cooled down and isolated using a filter/dryer apparatus. The filtrate is sent to a filtrate-receiving tank.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-037	A breaking hood, a discharge hood that are used during the discharge process of dry product into drums.	99% efficient HEPA Filter CD-631-3647 to control PM emissions
EC- 038	Two charge tanks that feed the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The organic phase (batch in solution) is concentrated in the reactor under vacuum generated by a steam propeller. The vapors are condensed by condenser and sent to a hotwell. The condensed vapors are sent to a distillate-receiving tank for recovery or disposal. When the desired volume is reached, the solution is cooled down, another solvent is added and the solution is heated to	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	dissolve the material again. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum generated by another steam propeller. The vapors are sent to a hotwell after condensation. The distillate is sent to a receiving tank for disposal. When the desired volume is reached, the suspension is cooled down and the crystallizing solvent is added through a charge tank (3). The suspension is cooled down and filtered in a nutsche filter. The product is dried in a dryer under vacuum generated by two steam propellers whose vapors are condensed by condensers and sent to a hotwell.	
EC- 039	Two charge tanks that feed the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The organic phase (batch in solution) is concentrated in the reactor under vacuum generated by a steam propeller. The vapors are condensed by condenser and sent to a hotwell. The vapors are sent to a distillate-receiving tank for recovery or disposal. When the desired volume is reached, the solution is cooled down, another solvent is added and the solution is heated to dissolve the material again. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum generated by another steam propeller. The vapors are concentrated and sent to a hotwell. The distillate is sent to a receiving tank for disposal. When the desired volume is reached, the suspension is cooled down and a crystallizing solvent is added through a charge tank (3). The material goes to a filter/dryer apparatus.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC- 040	A reactor where the reaction is carried out. The batch is concentrated under vacuum generated by a steam propeller whose vapors are condensed by condenser and sent to a hotwell. After the vapors are condensed, they are sent to a distillate-receiving tank prior to disposal. The resulting suspension is filtered through a nutsche filter and the filtrate is sent to a filtrated receiving tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-041	A reactor where the reaction is carried out. The batch is concentrated under vacuum generated by a steam propeller, the vapors are condensed and sent to a hotwell. The vapors are sent to a distillate-receiving tank prior to disposal. The wet material is dried out under vacuum generated by a steam propeller whose vapors are condensed by condenser.	Carbon Adsorption Unit CD-631-3400 to estimate HAP emissions on a monthly basis
EC-042	A reactor where the material is dissolved by refluxion in a solvent/water mixture. The vapors are condensed. The batch in solution is bleached and clarified using a sparkler filter. The batch is transferred to the crystallizer where the volume is reduced by concentration under vacuum generated by a steam	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	propeller whose vapors are condensed by condensers and sent to a hotwell. The vapors generated are condensed. The batch in solution is bleached and clarified using a sparkler filter. The batch is transferred to the crystallizer where the volume is reduced by concentration under vacuum generated by a steam propeller whose vapors are condensed. The vapors are sent to a distillate-receiving tank prior to disposal through hazardous wastes. The desired volume is cooled down and filtered. Then the filtrated is discarded.	
EC-043	A reactor where the material is dissolved by refluxion in a solvent/water mixture. The vapors are condensed. The batch in solution is bleached and clarified using a sparkler filter. The batch is transferred to the crystallizer where the volume is reduced by concentration under vacuum generated by a steam propeller whose vapors are condensed by condensers and sent to a hotwell. The vapors generated are condensed and sent to a distillate-receiving tank prior to disposal through hazardous wastes. After the desired volume is reached, the batch is cooled down using a nutsche filter. The filtrate is kept in the filter until the yield is obtained and then it is discarded. The wet material is dried out under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell.	
EC- 044	A reactor where the material is dissolved by refluxion in a solvent/water mixture. The vapors are condensed and the batch in solution is bleached and clarified using a sparkler filter. The batch is transferred to the crystallizer where the volume is reduced by concentration under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell . The vapors are condensed and sent to a distillate tank prior to disposal. After the desired volume is reached, the batch is cooled down and filtered by centrifuge and a nutsche filter in series. The filtrate is kept in the nutsche filter until the yield is obtained and then it is discarded through hazardous wastes or kept in drums to be recovered later. The wet material is dried out under vacuum generated by two steam propellers and the vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC- 045	The material is dissolved by refluxion in a solvent/water mixture in a reactor. The vapors are condensed and the batch in solution is bleached and clarified using a sparkler filter. The batch is transferred to the crystallizer where the volume is reduced by concentration under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. The vapors generated are condensed and sent to a distillate-receiving tank prior to disposal through hazardous wastes. When the desired volume is obtained, the batch is cooled down and filtered using a centrifuge and a nutsche filter in series. The wet material is dried out under vacuum generated	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	by a steam propeller whose vapors are condensed and sent to a hotwell.	
EC- 046	A reactor (1) where the reaction is carried out. Water is added to the other reactor (2) to precipitate the material. The batch is transferred to the precipitator and isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. The product is transferred to drums for disposal. The wet product is transferred to drums for later processing.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC- 047	A reactor (1) where the reaction is carried out. Water is previously added to the other reactor (2) to precipitate the material. The batch is transferred to the precipitator and isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. The wet product is transferred to a dryer that uses vacuum generated by two steam propellers. The vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-048	A charge tank that feeds the reactor (1) where the reaction is performed. Water previously contained in another reactor (2) is added to precipitate the material. The batch is transferred to the precipitator and isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. The wet material is transferred to a dryer that uses vacuum generated by two steam propellers, whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-049	A reactor where the reaction is carried out. The mixture is refluxed so that it dissolves. The vapors are condensed. The batch is concentrated, the vapors are condensed and sent to a distillate-receiving tank. Water is added to precipitate the material, and the product is isolated. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-050	A reactor where the reaction is carried out. The mixture is refluxed so that it dissolves. The vapors are condensed by condensers. The batch is concentrated and the vapors are sent to a distillate-receiving tank. Water is added to precipitate the material that is isolated by filtration using a nutsche filter. The filtrate is sent to a filtrate-receiving tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to estimate HAP emissions on a monthly basis
EC-051	A reactor where the materials are mixed and heated to bring about the reaction. The vapors are condensed by condenser. When the reaction is completed, water contained in another reactor (2) is added to precipitate the material. The batch is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank. The wet material is transferred to a dryer where the vacuum is generated by two	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	steam propellers whose vapors are condensed and sent to a hotwell.	
EC-052	A reactor (1) where the materials are mixed and heated to bring about the reaction. The vapors are condensed by condenser. When the reaction is completed, water contained in another reactor is added to precipitate the material. The batch is isolated by filtration using a nutsche filter. The filtrate is sent to a filtrate-receiving tank prior to disposal. The wet material is transferred to a dryer where the vacuum is generated by two steam propellers whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-053	A reactor where the materials are mixed and heated to bring about the reaction. The vapors are condensed by condenser. When the reaction is completed, water contained in another reactor (2) is added to precipitate the material. The batch is isolated by filtration using a nutsche filter. The filtrate is sent to a filtrate-receiving tank prior to disposal. The vapors are condensed by condenser.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC- 054	A reactor where the materials are mixed and heated to bring about the reaction. The vapors are condensed by condenser. Water is added to complete the reaction contained in another reactor and precipitate the material. The batch is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC- 055	A poking hood and a discharge hood that trap airborne particulate material during the discharge process of the dry material into drums.	Baghouse CD-631-3647 with 99% efficient HEPA Filter for PM Baghouse CD-631-3648 99% efficient for PM
EC-056	Two charge tanks (1, 2) that feed the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and three holding tanks. The batch in solution is concentrated under vacuum generated by a steam propeller to remove the water and perform the third reaction. The vapors generated during the concentration are condensed and sent to a distillate-receiving tank (1) prior to disposal or recovery. The pH of the solution is adjusted, and a series of washes with water are performed. The batch is transferred to the crystallizer where it is concentrated under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
EC-057	Two tanks (1, 2) that feed the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and three holding tanks. The batch in solution is concentrated under vacuum generated by a steam propeller to remove the water and perform the third reaction. The vapors generated by the propellers are condensed and sent to a hotwell. The vapors generated during the concentration are condensed and sent to a distillate-receiving tank (1) prior to disposal or recovery. The pH of the solutions is adjusted, and a series of washes with water are performed. The batch is transferred to the crystallizer where it is concentrated under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. The vapors generated during the concentration are condensed and sent to a distillate-receiving tank (2) prior to disposal or recovery. When the desired volume is reached, another solvent is added through another charge tank (3). The material is concentrated again and the suspension is cooled down to add another solvent through the other charge tank (3). The material is concentrated again and the suspension is cooled down to add another solvent through another charge tank (4). The vapors are condensed and sent to a distillate-receiving tank prior to disposal. The product is isolated by filtration using a filter/dryer apparatus. The filtrate is sent to a filtrate-receiving tank prior to disposal. The wet material is dried out under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-058	A charge tank (1) that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The organic phase is concentrated in the reactor under vacuum generated by a steam propeller. The vapors are condensed and sent to hotwell. Then the vapors are sent to a distillate-receiving tank for recovery or disposal. When the desired volume is reached, the solution is cooled down and another solvent is added and heated to dissolve the material again. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum generated by another steam propeller. The vapors are condensed and sent to a hotwell. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum generated by another steam propeller. The vapors are condensed and sent to a hotwell. The distillate is sent to a receiving tank (2) prior to disposal. When the desired volume is reached, the suspension is cooled down and the crystallizing	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	solvent is added through a charge tank (2). The suspension is cooled down, and the material is isolated by filtration using a filter/dryer apparatus. The filtrate is sent to a filtrate-receiving tank, and the product is dried out under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell.	
EC-059	A charge tank (1) that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The organic phase is concentrated in the reactor, under vacuum. The vapors generated are condensed and sent to a distillate-receiving tank (1) for recovery or disposal. When the desired volume is reached, the solution is cooled down, another solvent is added and the solution is heated to dissolve the material again. The material is transferred to the crystallizer where it is concentrated under vacuum generated by another steam propeller. The vapors are condensed and sent to a hotwell. The distillate is sent to a receiving tank (2) for disposal. When the volume is reached, the suspension is cooled down and the crystallizing solvent is added through a charge tank (2). The suspension is cooled down and the material is isolated by filtration.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-060	A charge tank (1) that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extraction are performed using a separation bottle and two holding tanks. The organic phase is concentrated in the reactor under vacuum generated by a steam propeller. The vapors are condensed and sent to a hotwell. The vapors are condensed and sent to a distillate-receiving tank for recovery or disposal. When the volume is reached, the solution is cooled down, another solvent is added and the solution is heated to dissolve the material. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum by another steam propeller.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-061	A charge tank (1) that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The organic phase is concentrated in the reactor under vacuum generated by a steam propeller. The vapors are condensed and sent to a hotwell. The vapors are condensed and sent to a distillate-receiving tank for recovery or disposal. When the volume is reached, the solution is cooled down, another solvent is added, and the solution is heated to dissolve the material. The batch in solution is transferred to the crystallizer where it is concentrated under vacuum by another steam propeller. The	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	vapors are sent to a hotwell.	
EC-062	A reactor where the reaction is carried out heated and the vapors are condensed. The batch in solution is concentrated and the vapors are condensed by condenser and sent to a distillate-receiving tank. Water is added to the reactor to precipitate the material that is isolated by filtration and sent to a distillate-receiving tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-063	A charge tank that feeds the reactor where the reaction is carried out. The material is dissolved in another reactor before it is transferred to reactor (1). When the reaction is completed, the batch is precipitated and isolated by filtration.	Baghouse CD-631-3647 99% efficient for PM.
EC-064	A charge tank that feeds the reactor (1) where the reaction is carried out. The material is dissolved in another reactor (2) before it is transferred to the reactor (1). Once the reaction is completed, it is precipitated in a precipitator and isolated by filtration using a centrifuge and a nutsche filter in series to collect all the material. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. The refluxed solvent is eventually discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-065	A charge tank that feeds the reactor where the reaction is carried out. When the reaction is completed, water previously contained in another reactor (2) is added to precipitate it. The batch is transferred to the precipitator and is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank. The refluxed solvent passes through some pieces of equipment and then is transferred to another recipient where water is added. The mixture is stirred prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-066	A charge tank that feeds the reactor where the reaction is carried out. When the reaction is completed, the pH is adjusted and a series of separations and extractions are performed using a separation bottle and two holding tanks. The organic phase is returned to the reactor (1) where it is concentrated to remove the water from the batch. The vapors are condensed and sent to the distillate holding tank prior to disposal. The batch in solution is transferred to the reactor (2) where the second reaction is carried out but before that the batch passes through a molecular sieve column to remove any presence of water. The batch is precipitated, the pH is adjusted with a basic solution that is charged through the charge tank (2), the batch is cooled down and isolated by centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	disposal. The refluxed solvent is discarded and the vapors are condensed.	
EC-067	A charge tank that feeds the reactor where the reaction is carried out. Then the batch is concentrated under vacuum, the vapors are condensed and sent to a distillate-receiving tank. When the desired volume is reached, the suspension is cooled down and the material is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank. The refluxed solvent is discarded and the vapors are condensed.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-068	A charge tank that feeds the reactor where the material is dissolved by refluxion in a solvents mixture. The vapors are condensed. The batch in solution is transferred to the crystallizer where it is concentrated. The vapors are condensed and sent to a filtrate receiving tank or to the crystallizer before being discarded. The wet product is dried in a dryer under vacuum generated by a steam propeller. The vapors are condensed and sent to a hotwell. The refluxed solvent is discarded and the vapors are condensed.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-069	A reactor (2) where the material is dissolved in a solvent mixture. The organic phase is transferred to the reactor (1) through a separation bottle. The aqueous phase is discarded and the reagents are added through a charge tank, and a concentration is performed to remove part of the solvents. The vapors are condensed. Another concentration, this time under vacuum generated by a steam propeller, is performed to reduce the volume. The vapors are condensed and sent to a hotwell. The distillate is sent to a distillate-receiving tank for recovery or disposal. The batch is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank prior to disposal. The reactor (2) can serve as an alternate filtrate-receiving tank. When distillation is under vacuum, the vacuum is generated by a steam propeller or by a pump. When it is generated by a steam propeller, the vapors are condensed and sent to a hotwell. When it is generated by a pump, the vapors are condensed by condenser. The refluxed solvent is discarded and the vapors are condensed.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-070	Charge tank (1) that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The batch in solution is concentrated to remove the water and bring about the third reaction. The vapors are condensed and sent to a distillate receiving tank (1) prior to disposal or recovery. The pH of the batch in solution is adjusted and a series of washes with water are performed. The batch is transferred to the crystallizer where it is concentrated under vacuum generated by a steam	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	propeller. The condensed vapors are sent to a distillate-receiving tank (2) prior to disposal. When the desired volume is reached, another solvent is added through another charge tank (2). The suspension is concentrated and cooled down to add another solvent through another charge tank (3). The vapors are condensed and sent to a distillate-receiving tank prior to disposal. The product is isolated by filtration using a nutsche filter. The filtrate is returned to the crystallizer. The material is dried a dryer under vacuum generated by two steam propellers whose vapors are condensed and sent to a hotwell. The refluxed solvent is discarded and the vapors are condensed.	
EC-071	A charge tank (1) that feeds the reactor where the first and second reactions are carried out. Water is added and a series of separations and extractions are performed using a separation bottle and two holding tanks. The batch in solution is concentrated to remove the water and to perform the third reaction. The vapors generated during the concentration are condensed and sent to a distillate-receiving tank (1) prior to disposal or recovery. The pH of the solution is adjusted and a series of washes with water are performed. The batch is transferred to the crystallizer where it is concentrated under vacuum generated by a steam propeller. The vapors are sent to a hotwell. The vapors generated during the concentration are condensed and sent to a distillate-receiving tank (2) prior to disposal or recovery. When the desired volume is reached, another solvent is added through another charge tank (2). The batch is concentrated again and the suspension is cooled down in order to add another solvent through another charge tank (3). The vapors are condensed and sent to a distillate-receiving tank prior to disposal. The product is isolated by filtration using a filter/dryer apparatus.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-072	A reactor where the material is dissolved by refluxion in a solvent mixture. The vapors are condensed by condenser. The batch in solution is transferred to the crystallizer where the volume is reduced so that the material crystallizes. The vapors are condensed and sent to a distillate-receiving tank for recovery or disposal. The batch is cooled down and isolated using a centrifuge. The filtrate is sent to a filtrate-receiving tank prior to disposal. The material is washed with a solvent mixture prepared in a mixing tank and then transferred to the dryer. In the dryer, the vacuum is generated by a steam propeller, and eventually the material is sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-073	A reactor where the material is dissolved by refluxion in a	Carbon Adsorption

Emission Unit	Equipment Configuration Description	Control Equipment
	solvent mixture. The organic phase is transferred to a holding tank and the aqueous phase is discarded. The organic phase is returned to the reactor where the reaction is carried out. The reagents are added through charge tanks. A concentration is performed to remove part of the solvents. The vapors are condensed and sent to a distillate-receiving tank prior to disposal or recovery. A concentration is performed under vacuum to reach the desired volume. The vacuum is generated by a pump and the vapors are condensed by condenser. The batch is cooled down and isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank. The refluxed solvent is discarded.	Unit CD-631-3400 to control HAP and VOC emissions.
EC-074	A reactor where the material is dissolved in a hot solvent. The vapors are condensed and the distillate is sent to a distillate-receiving tank. The batch is cooled down and water is added to precipitate the material. Then, it is transferred to the precipitator containing water and it is stirred. The product is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank through a level tank prior to disposal. The refluxed solvent is discarded and the vapors are condensed and sent to a hotwell.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-075	A micronizer that reduces the size of the product's particles. The product is recovered in a recovery area. The generated particulate is controlled by a filter.	Baghouse CD-631-3647 99% efficient for PM Baghouse CD-631-3648 99% efficient for PM
EC-076	A reactor where the material is refluxed in a solvent for a period of time. The vapors are condensed by condenser. Then the suspension is cooled down and the product is isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank prior to disposal. The product is dried out under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. The refluxed solvent is discarded and the vapors are condensed.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-077	A reactor where the material in solution is precipitated. The product is isolated by filtration using a filter/dryer apparatus. The filtrate is sent to a filtrate-receiving tank prior to disposal. The product is dried out under vacuum generated by a steam propeller whose vapors are condensed by condensers.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-078	A holding tank where the inoculation process begins. After a period of time the mixture is transferred to a larger capacity holding tank (2) prior to transfer into the fermenter. The material is dissolved in a dissolving tank before it is added to	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	the fermenter. The material is dissolved in a dissolving tank before it is added to the fermenter.	
EC-079	An extraction column that receives the material from the holding tank 7 and alternately from tanks 2 or 3. The column performs a series of separations sending the enriched portion to the holding tank 5 and the spent broth to the holding tanks 4 or 6. When the level in the holding tank 5 reaches a given value, the material is transferred to the decanter 1 where a phase separation is performed. The enriched phase is sent to another area.	Scrubber CD-621-3202, CD-621-3203 and CD-621-3204 with a 90% minimum efficiency for HAP.
EC 080	A charge tank that feeds the reactor where the solvent is refluxed for a period of time before it is transferred to the centrifuge, level tank and filtrate tank prior to disposal. The vapors are condensed by condenser. The process is repeated until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC 081	A reactor where a solvent is refluxed for a period of time before it is transferred to the centrifuge and to the filtrate tank prior to disposal. The vapors generated are condensed by condenser. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-082	A reactor where the solvent is charged, stirred and transferred to the precipitator, to the centrifuge, to the level tank, and filtrate tank. The solvent is returned to the precipitator through a separation bottle and recirculated for some time before it is discarded. The process is repeated as needed until no active materials are present.	Scrubber CD-631-3401 99% efficient for acids.
EC-083	A reactor where the solvent is refluxed for a period of time before it is recirculated through a sparkler filter. The hot solvent is transferred to the crystallizer, refluxed for a period of time before it is recirculated through a sparkler filter. The hot solvent is transferred to the crystallizer, refluxed again, and recirculated through the centrifuge prior to disposal. The vapors are condensed by condenser. The process is repeated as needed until no active materials are present. The solvent is charged again into the reactor and transferred to the crystallizer. In the crystallizer, part of the solvent is distilled and sent to the distillate-receiving tank. The solvent is transferred to the filtrate-receiving tank through a centrifuge and the level tank prior to disposal.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-084	A receiving tank (1) that receives solvent from another area. The solvent is transferred to the evaporator where it is recirculated prior to transference to one of two holding tanks available. Then, it is charged into the reactor where it is	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	refluxed. A part is condensed and sent to the distillate-receiving tank (2) prior to disposal or it is sent back to the reactor. The remnant in the reactor is discarded. The vapors generated are condensed by condenser. The hot solvent is passed through a centrifuge and sent to the filtrate-receiving tank prior to disposal.	
EC-085	A charge tank that feeds the reactor where the solvent is refluxed for a period of time before it is transferred to the receiving tank 1 through a separation bottle. The hot solvent is returned to the reactor and sent to the holding tank 2 prior to disposal. The vapors are condensed by condenser. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-086	A charge tank that feeds the reactor where the solvent is refluxed for a period of time before it is transferred to the holding tank 1 through a separation bottle. The hot solvent is returned to the reactor and sent to the holding tank 2 prior to disposal. The vapors are condensed by condenser. The process is repeated as needed until no active materials are present. The solvent is charged again, it is heated by refluxion and a part is distilled and sent to the distillate holding tank. The remnant is transferred to the crystallizer prior to disposal. The vapors are condensed by condensers. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-087	A reactor where the solvent is refluxed for a period of time before it is transferred to the precipitator. The hot solvent is recirculated from the precipitator to the filtrate tank through the centrifuge and the level tank prior to disposal. The vapors generated are condensed by condenser. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-088	A charge tank that feeds the reactor where the solvent is refluxed for a period of time before a part is distilled into the distillate-receiving tank prior to disposal. The remnant is recirculated from the reactor to the holding tank 1 through the separation bottle. The solvent is recirculated from the reactor to the holding tank 2 through the separation bottle, and from there to the precipitator. From the precipitator it is transferred to the centrifuge and finally to the filtrate holding tank through the level tank prior to disposal. The vapors are condensed by condenser. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-089	A charge tank that feeds the reactor where the solvent is refluxed for a period of time before it is transferred to the holding tank 1 through the separation bottle. The hot solvent is transferred to the holding tank 2 through the separation bottle prior to disposal. The vapors generated are condensed by condensers. The process is repeated as needed until no active	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
	materials are present.	
EC-090	A reactor where a solvent is refluxed for a period of time before a part of it is transferred to the crystallizer. The solvent is refluxed in the crystallizer and a part is distilled and sent to the distillate-receiving tank prior to disposal. The vapors generated are condensed by condenser. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-091	A charge tank that feeds the reactor where a solvent is refluxed for a period of time before it is transferred to the crystallizer where the reflux is heated again. A part is distilled and sent to the distillate holding tank prior to disposal. The remnant in the crystallizer is transferred to the precipitator and recirculated through a centrifuge, the level tank and the filtrate tank prior to disposal. The vapors generated are condensed by condenser. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-092	A reactor where a solvent is refluxed for a period of time before it is transferred to the crystallizer where it is heated again by refluxion. The solvent is recirculated through the separation bottle, the holding tank 1, returned to the crystallizer to be transferred to the holding tank, returned to the crystallizer and from there to the holding tank 3 prior to disposal. The vapors are condensed by condenser. The process is repeated as needed until no active materials are present. Solvent is charged again into the reactor, it is heated by refluxion and a part is distilled and sent to the distillate holding tank 2 prior to disposal. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-093	A reactor where a solvent is refluxed for a period of time before it is transferred to the crystallizer where the reflux is heated again. A part is distilled and sent to a distillate-receiving tank prior to disposal. The remnant in the crystallizer is transferred to the nutsche filter and finally to the portable reactor, from where it is returned to the crystallizer for disposal. The vapors generated are condensed by condensers. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-094	A reactor where a solvent is recirculated for a period of time through the sparkler filter and back to the reactor. Then, the solvent is transferred to the crystallizer, pressure filter and filtrate-receiving tank prior to disposal. The process is repeated as needed until no active materials are present.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-095	A reactor where the solvent is refluxed and recirculated through the sparkler filter. The solvent is transferred to the crystallizer where it is heated again by refluxion before it is charged and recirculated through the pressure filter and filtrate	None

Emission Unit	Equipment Configuration Description	Control Equipment
	tank. The vapors are condensed by condenser. The process is repeated as needed until no active materials are present.	
EC-096	An evaporator that recirculates solvent for a period of time before it is transferred to one of two holding tanks available. Part of the solvent is distilled under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. The solvent in the holding tanks is transferred to the reactor for disposal or recovery. The vapors are condensed by condenser.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-097	A reactor where the material is dissolved in a solvent. The batch in solution is concentrated under vacuum generated by a steam propeller whose vapors are evaporated and sent to a hotwell. Then, the vapors are sent to a distillate holding tank for recovery or disposal. Another solvent is added to assist in the crystallization, it is cooled down and isolated by filtration using a centrifuge. The solvent is returned to the crystallizer through the filtrate receiving tank, to wash the walls, or discarded. The wet material is dried out under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. The refluxed solvent is discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.
EC-098	A reactor (2) where the material is dissolved in a solvent mixture. The organic phase is transferred to another reactor (1) through a separation bottle. The aqueous phase is returned to the reactor (2) where it is extracted with additional solvent. The extract is combined with the batch in the reactor (1). The reagents are added through a charge tank. When the reaction is completed, water is added and a series of extractions and separations are performed using a separation bottle and reactors (1) and (2). The batch in solution is transferred to reactors (1) and (2). The batch in solution is transferred to reactor (1) and it is concentrated. The vapors are condensed and sent to a distillate-receiving tank for recovery or disposal. Another solvent is added and it is concentrated again to remove part of the solvents. Another concentration under vacuum generated by a steam propeller whose vapors are condensed and sent to a hotwell. When the desired volume is reached, the batch is cooled down and isolated by filtration using a centrifuge. The filtrate is sent to a filtrate-receiving tank prior to disposal or recovery. When the distillation is under vacuum a steam propeller or a pump is used. If a steam propeller is used, the vapors are condensed and sent to a hotwell. If a pump is used, the vapors are condensed by condenser. The refluxed solvent is discarded.	Carbon Adsorption Unit CD-631-3400 to control HAP and VOC emissions.

Emission Unit	Equipment Configuration Description	Control Equipment
EC-101	A *Spray Dryer* where the product in solution is dried out.	A *Venturi Scrubber* CD-531-3417 99% efficient for PM-10. A *Venturi Scrubber* CD-331-4121 95% efficient for PM-10.
EC-102	A reactor where the materials are charged. Some materials are charged using the central vacuum system and others through the charge tank 2. The batch is stirred, the pH is adjusted, and the batch is cooled down. More materials are added through the charge tank 1 while the pH continues to be adjusted through the charge tank 2. The last step is repeated until the reaction is completed. The batch is transferred to the concentrator. The reactor is rinsed and the rinsings are discarded. The batch may be temporarily transferred to a holding tank if the concentrator is in use. The batch is concentrated in the concentrator at a specific volume using a condenser and three steam propellers in series. The distillate is discarded through a hotwell. Water is added and the batch is cooled down before it is isolated by filtration. The filtered batch is sent to a batch in solution receiving tank.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC.
EC-103	A reactor (1) where some materials are charged using the Central vacuum system. The materials are refluxed to bring them to a solution and to have the first reaction brought about. The batch in solution is concentrated to a given volume and cooled down. The distillate is sent to a receiving tank and transferred to drums or to the reactor 2 that is used sometimes as holding tank. Other materials are added to the batch in the reactor 1, whether through the central vacuum system or a charge tank. The batch is concentrated to half its original volume. The distillate is collected in a distillate-receiving tank and transferred to the distillate-receiving tank 1 prior to disposal. Other materials are added and it is distilled again until a given volume is reached. The distillate is collected in a receiving tank and from there it is transferred to the distillate-receiving tank 2 prior to disposal. Water is added and the batch is heated to complete the reaction. The batch is cooled down and the pH is adjusted, the batch is filtered and collected in the receiving tank to feed the column. The reactor 1, the condenser and the receiving tank are two sets of equipment that can be used depending on their availability.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC. A condenser CD-531-3839 99% efficient for HAP and VOC. A condenser CD-531-3840 99% efficient for HAP and VOC.

Emission Unit	Equipment Configuration Description	Control Equipment
EC-104	A reactor (2) into which a solvent is charged through the central vacuum system and refluxed. The solvent is transferred to drums or discarded through a hotwell, depending on the lab results. The reactor 1, which is used as a holding tank, feeds the reactor 2 where the solvent is refluxed and then discarded through a hotwell. The reactor 2 and the condenser are two sets of equipment that are used depending on their availability.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC. A condenser CD-531-3839 99% efficient for HAP and VOC. A condenser CD-531-3840 99% efficient for HAP and VOC.
EC-105	A reactor (1) into which the materials are charged through the central vacuum system and the reaction is carried out. Half of the batch is transferred to the reactor 2, and the batches are cooled down and let stand in both reactors so that the phases separate. The aqueous phases in both reactors are filtered and transferred to the batch in solution receiving tank. The organic phase in the reactor 1 is transferred to the reactor 2 and they are let stand so that another separation is carried out. The aqueous phase is filtered and combined with the other in the receiving tank. The organic phase is charged into drums for disposal.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC.
EC-106	A reactor (1) that is used as a charge tank. Some materials are charged through the central vacuum system. Others are charged into the charge tank 1 or into the reactor 2. The content of the reactor 1 is transferred into the charge tank 2. Equal amounts of the contents of charge tanks 1 and 2 are added to reactor 2 while the temperature and the flow rate are kept. Part of the mix in reactor 2 is filtered and transferred to the concentrator. The remnant is filtered and transferred to the recovery holding tank. The part in the concentrator is concentrated while the content of the recovery holding tank is added to it. The vapors are condensed by condenser with three steam propellers in series whose vapors are condensed and sent to a hotwell. The distillate is sent to a distillate-receiving tank prior to disposal through the hotwell. When the concentration is completed, other materials are charged. After the phases separate, the organic phase is transferred to drums to be discarded. The pH of the aqueous phase (batch) is adjusted and the batch is transferred to the receiving tank that feeds the column.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC.
EC-107	A reactor (1) that is used to feed the charge tank 2, which is then transferred to reactor 2 prior to disposal through a hotwell. Solvent is charged again into reactor 1 and the	None

Emission Unit	Equipment Configuration Description	Control Equipment
	content is analyzed for a specific parameter. If the result is greater than the specification, the content is transferred to charge tank 2 and from there to reactor 2 prior to disposal through a hotwell. This is repeated until the analysis is lesser or equal to the specification, then it is transferred to the charge tank 2. The charge tank 1 is filled and the content is recirculated. The contents of charge tanks 1 and 2 are transferred to reactor 2, to the concentrator, and from there it is discarded through the hotwell.	
EC-108	A conveyor belt with a bag opener. The content of the bags is charged into a tank to be mixed with the other materials.	A Cyclone CD-337-4136 99% efficient for PM-10
EC-109	A charge tank whose content is transferred into a reactor and finally into a hotwell.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC.
EC-110	A reactor whose content is transferred to a holding and/or receiving tank and finally to a reactor to then by filtered and charged to a holding and/or receiving tank prior to disposal.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC.
EC-111	A reactor that is charged with a material that is refluxed and analyzed for a specific parameter. If the result is greater than the specification it is discarded through a hotwell. Again, material is charged to the reactor and refluxed again. The process is repeated until the result of the analysis is less or equal to the specification; then, the material is transferred to drums. Another material is charged to the reactor using the central vacuum system and it is stirred, a sample is taken and analyzed for a specific parameter. If the result of the analysis is greater than the specification, the material is discarded through the hotwell. The reactor is charged again and the process is repeated until the result of the analysis is less or equal to the specification and then it is transferred to drums.	A *Packed Scrubber* CD-531-3412 98% efficient for HAP and VOC. A condenser CD-531-3840 99% efficient for HAP and VOC.
EC-115	A process waste pit that receives charges from various processes. It is discharged with a pump into the Process Waste tank in the Utilities Area. This pit is underground in a concrete box with a metal lid. This pit does not have a point of emission and is not connected to any control equipment.	None
EC-116	A hazardous waste tank that receives charges from various processes. This tank is discharged with a pump into the Hazardous Waste tank in the Utilities Area.	None

Emission Unit	Equipment Configuration Description	Control Equipment
EC-117	Two horizontal aboveground storage tanks. The two tanks have the same point of emission (EP-631-3400).	Carbon Adsorption Unit CD-631-3400 to estimate HAP and VOC emissions
EC-118	Ten vertical aboveground storage tanks.	A *Conservation Vent* in CD-621-3211, CD621-3225, CD-242-3002, CD-348-3001, CD-348-3002, CD-348-3003 CD-621-3208, CD-621-3209, CD-621-3212 to control HAP and VOC emissions.
EC-119	One vertical aboveground storage tank.	A *Conservation Vent* CD621-3225 to control HAP emissions.
EC-120	A horizontal aboveground storage tank.	A *Conservation Vent* CD-441-3200 to control HAP and VOC emissions.
EC-121	Three 35 MMBtu/hr boilers, each one uses fuel to produce vapor.	None
EC-122	Five emergency power plants	None
EC-124	Water treatment plant	None

Section III – General Conditions

1. **Sanctions and Penalties**: ***Schering*** must comply with all the terms, conditions, requirements, limitations and restriction established in this permit. Any violation to the terms of this permit is subject to administrative, civil or criminal measures, as established in Section 16 of the Environmental Public Policy Act (Law No. 416 of September 22, 2004).

2. **Right of Entry:** In keeping with the provisions of Rules 103 and 603(c)(2) of the RCAP, the permittee must allow the entry of EQB representatives in the permittee's facilities, upon presentation of credentials, to carry out the following activities:

a) Enter or go in the premises where an emission source is located, or where air emissions related activities are conducted, or where records are kept under permit conditions, under the RCAP, or under the federal Clean Air Act;

b) To have access to, and copy, at reasonable times, any records that must be kept under the conditions of the permit, under RCAP, or under the federal Clean Air Act;

c) Inspect and examine any facility, equipment (including monitoring and air pollution control equipment), practices or operations (including QA/QC methods) regulated or required under this permit; as well as sampling emissions and fuels;

d) As authorized by the Clean Air Act and the RCAP, to sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the permit or other applicable requirements.

3. Sworn Statement: All reports required pursuant to Rule 103(D) of the RCAP (i.e., semiannual monitoring reports and annual compliance certification), must be submitted together with a sworn statement or affidavit by the Responsible Official or a duly authorized representative. The sworn statement must attest to the truth, correctness and accuracy of said records and reports.

4. Data Availability: As specified under Rule 104 of the RCAP, all emission data obtained by or submitted to the EQB, including data reported pursuant to Rule 103 of RCAP, as well as that obtained in any other way, shall be available for public inspection and shall also be made available to the public in any additional manner that the EQB may deem appropriate.

5. Emergency Plan: As specified under Rule 107 of the RCAP, the permittee shall have available an Emergency Plan which must be consistent with adequate safety practices and provide for the reduction or retention of the emissions from the facility during periods classified by the EQB as air pollution alerts, warnings or emergencies. These plans shall identify the emission sources, include the reduction to be accomplished for each source, and the means by which such reduction will be accomplished. These plans will be available for inspection by any EQB authorized representative at any time.

6. Control Equipment: The permittee shall comply with Rule 108 of the RCAP, as follows:

(A) All air pollution control equipment or control measures shall provide for continuous compliance with applicable rules and regulations. Said equipment or measures shall be installed, maintained, and operated according to those conditions imposed by this Title V Permit, within the manufacturer specified operating limitations.

(B) The collected material from air pollution control equipment shall be disposed in accordance with applicable rules and regulations. The removal, handling, transportation, storage, treatment or disposal will be done so as not to produce environmental degradation, and in accordance with applicable rules and regulations.

(C) The EQB may require, when deemed appropriate to safeguard the health and welfare of human beings, the installation and maintenance of additional, complete and separate air pollution control equipment of a capacity that may be up to equal the capacity of the primary control equipment. Furthermore, the EQB may require that said additional air pollution control equipment be operated continuously and conjunctionally with the commonly required air pollution control equipment.

(D) All air pollution control equipment shall be operated at all times while the emission source being controlled is in operation.

(E) In the case of a shutdown of air pollution control equipment for the scheduled maintenance, the intent to shutdown such equipment shall be reported to the Board at least three days prior to the planned shutdown. Said prior notice shall include, but will not limited to the following:

(1) Identification of the specific source to be taken out of service with its location and permit number.

(2) The expected length of time that the air pollution control equipment will be out of service.

(3) The nature and quantity of air pollutants likely to be emitted during the shutdown period.

(4) Special measures such as the use of off-shift labor and additional equipment that will be taken to minimize the length of the shutdown period.

(5) The reasons why it will be impossible or impractical to shutdown the operating source during the maintenance period.

(F) The permittee shall to the extent possible, maintain and operate at all times, including periods of start-up, shutdown and malfunction, any affected source, including the associated air pollution control equipment, in a manner consistent with the design specifications of the original manufacturer and in compliance with applicable rules and regulations and permit conditions.

(G) The permittee shall maintain copies of all the monthly calibrations and inspections of the control equipments such as baghouses and scrubbers. The permittee shall record in a logbook all the periods when the control equipment is in shutdown and the process continues its operation. All the records shall be available to the EQB personnel upon request.

7. Compliance Certification: As specified under Rule 602(c)(2)(ix)(C) of the RCAP, the permittee shall submit a compliance certification no later than 60 days after the anniversary of

the permit. The compliance certification shall be submitted to both the Board and the EPA[1]. It shall include the information required by Rule 603 (c) of the RCAP.

8. **Regulation Compliance:** As specified under Rule 115 of the RCAP, any violation to the RCAP, or to any other applicable rule or regulation, may be grounds for the EQB to suspend, modify, or revoke any relevant permit, approval, variance or other authorization issued by the EQB.

9. **Location Approval:** As specified under Rule 201 of the RCAP, nothing in this permit may be interpreted as authorizing the location or construction of a major stationary source, or the major modification of a major stationary source, without obtaining first an authorization from the EQB and without first demonstrating compliance with the National Ambient Air Quality Standards (NAAQS). This permit does not allow the construction of new minor sources without the required permit under Rule 203 of the RCAP.

10. **Open Burning:** As specified under Rule 402 of the RCAP, the permittee may not cause or permit the open burning of refuse in the premises of the facility, except as provided by sub-paragraph (E) of said rule that authorizes the permittee to conduct trainings or investigations on fire control techniques. The permittee shall keep records of the fire control activities related to investigation or training. These records will be available upon request.

11. **Particulate Fugitive Emissions:** As specified under Rule 404 of the RCAP the permittee may not cause or permit:

    a) the handling, transportation or storage of any material in a building and its structures or that a road is used, built, altered, repaired or demolished without first taking due precautions to prevent that particulate matter gains access to the air.

    b) the discharge of visible emissions of fugitive dust beyond the boundary line of the property on which the emissions originate.

12. **Objectionable Odors:** As specified under Rule 420 of the RCAP, the permittee may not cause or permit emissions to the atmosphere of any matter which produces an *objectionable* odor that can be perceived in an area other than that designated for industrial purposes. The permittee shall demonstrate compliance with Rule 420 (A)(1) as follows: if objectionable odors are detectable beyond the premises that have been designated for industrial purposes and complaints are received, the permittee shall investigate and take measures to minimize and/or eliminate the malodors, if necessary. [This condition is enforceable only by the State].

13. **Permit Renewal Applications:** As established under Rule 602 (a)(1)(iv) of the RCAP, the permittee's applications for permit renewal shall be submitted to the EQB at least 12 months

[1] The certification to the EQB shall be mailed to: Director, Air Quality Program, P.O. Box 11488, Santurce, PR 00910. The certification to the EPA shall be mailed to: Director CEPD, US EPA – Region II, Centro Europa Building, 1492 Ponce de León Ave. Stop 22, Santurce, PR 00909.

prior to the date of permit expiration. A responsible official shall certify all required applications in keeping with paragraph (c)(3) of Rule 602.

14. **Permit Duration:** As specified under Rule 603 of the RCAP, the following terms will apply during the duration of this permit:

    a) Expiration: This authorization will have a fixed term of 5 years. The expiration date will be automatically extended until the EQB approves or denies a renewal application only in those cases in which the permittee submits a complete renewal application at least 12 months before the expiration date. [Rules 603 (a)(2), 605 (c)(2), 605(c)(4) of the RCAP]

    b) Permit Shield: As specified under Rule 605 (c)(4)(i) of the RCAP, the permit shield may be extended beyond the original permit duration, until the time the permit is renewed, only if a timely and complete renewal application is submitted.

    c) In case that this permit is subject to any challenge by third parties, the permit will remain in effect until the time it is revoked by a court of law with jurisdiction in the matter.

15. **Recordkeeping Requirement:** As established under Rule 603(a)(4)(ii) of the RCAP, the permittee shall retain records of all required monitoring data and support information for a period of 5 years from the date of the monitoring sample, measurement, report, or application.

16. **Reporting Requirement:** As established under Rule 603(a)(5)(i) of the RCAP, the permittee shall submit reports of all required monitoring every 6 months, or more frequently if required by the EQB or any other applicable requirement. All instances of deviations from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official as established under Rule 602(c)(3) of the RCAP.

17. **Deviations Reporting due to Emergencies:** As specified under Rule 603(a)(5)(ii)(a) of the RCAP, any deviation resulting from an upset (such as sudden malfunction or break-down) or emergency conditions, as defined in Rule 603(e) of the RCAP, shall be reported within two working days from the moment in which the emission limits are exceeded due to the emergency if Schering-Plough Products, L.L.C wishes to assert the affirmative defense authorized under said section. If the permittee raises the emergency defense upon an enforcement action, the permittee shall have the burden of proof of demonstrating that such deviation happened due to an emergency and that the Board was adequately notified. If such emergency deviation lasts for more than 24 hours, the affected units may be operated until the end of the cycle or 48 hours, whichever occurs first. The Board may only extend the operation of an emission source in excess of 48 hours if the source demonstrates to the Board's satisfaction that the National Air Quality Standards will not be exceeded and that there will be no risk to the public health.

18. **Deviation Reporting (Hazardous Atmospheric Pollutants):** The source must cease operations immediately or must act as specified in its Emergency Reaction Plan (established in Rule 107 (C)), when said plan has demonstrated that there will be no significant impact in areas that are not those that have been designated for industrial purposes (This condition is enforceable only by the State). Pursuant to Rule 603 (a)(5)(ii)(b) of the RCAP, the permittee shall notify the EQB

within 24 hours after a deviation that results in the release of emissions of hazardous atmospheric pollutants for more than an hour in excess of the applicable limit. For the discharge of any regulated atmospheric pollutant that continues for more than 2 hours in excess of the applicable limit, the permittee shall notify the Board within 24 hours of the deviation. The permittee shall also submit to the EQB, within 7 days of the deviation, a detailed written report, which will include probable causes, time and duration of the deviation, remedial action taken, and steps that are being taken to prevent a reoccurrence.

19. **Severability Clause:** As established under Rule 603(a)(6) of the RCAP, the clauses in this permit are severable. In the event of a successful challenge to any portion of the permit in an administrative or judicial forum, or in the event any of its clauses is held to be invalid, all other portions of the permit shall remain valid and effective, including those related to emission limits, terms and conditions, be they specific or general, as well as monitoring, recordkeeping and reporting requirements.

20. **Permit Noncompliance:** As established under Rule 603(a)(7)(i) of the RCAP, the permittee shall comply with all conditions of this permit. Permit noncompliance constitutes a violation of the RCAP and will be grounds for taking enforcement action, impose sanctions, revoke, terminate, modify, and/or reissue the permit, or to deny a permit renewal application.

21. **Defense not Allowed:** As specified under Rule 603(a)(7)(ii) of the RCAP, the permittee may not assert as a defense in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

22. **Permit Modification and Revocation:** As specified under Rule 603(a)(7)(iii) of the RCAP, the permit may be modified, revoked, reopened, reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation, reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

23. **Property Rights:** As specified under Rule 603(a)(7)(iv) of the RCAP, this permit does not create or convey any property rights of any sort, nor does it grant any exclusive right.

24. **Obligation to Furnish Information:** As specified under Rule 603(a)(7)(v) of the RCAP, the permittee must furnish to the EQB, within a reasonable time, any information that the EQB may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the EQB copies of records required to be kept under the permit.

25. **Changes in Operating Scenarios:** As specified under Rule 603(a)(10) of the RCAP, the permittee shall record in a logbook, contemporaneously with making a change from one operating scenario to another, the scenario under which it is operating. This logbook must be kept at the facility at all times.

26. **Prohibition on Default Issuance:** As specified under Rule 605(d) of the RCAP, it may never be construed that a permit has been issued by default as a result of the EQB's failure to take final

action on a permit application within 18 months after the application completion date. The EQB's failure to issue a final permit within 18 months shall be treated as a final action solely for the purpose of obtaining judicial review in a state court.

27. Administrative Permit Amendments and Permit Modifications: As specified under Rule 606 of the RCAP, the permit may not be amended nor modified unless the permittee complies with the requirements for administrative permit amendments and permit modifications as described in the RCAP.

28. Permit Reopenings: As specified under Rule 608(a)(1) of the RCAP, this permit shall be reopened and revised under the any of the following circumstances:

a) Whenever additional applicable requirements under any law or regulation become applicable to the permittee, when the remaining permit term is of 3 or more years. Said reopening must be completed 18 months after promulgation of said applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions have been extended pursuant to Rule 605(c)(4)(i) or Rule 605(c)(4)(ii) of the RCAP.

b) Whenever the EQB or EPA determine that the permit contains a material mistake or that inaccurate statements were made in establishing the emission standards or other terms or conditions of the permit.

c) Whenever the EQB or EPA determines that the permit must be revised or revoked to assure compliance with the applicable requirements.

29. Changes in Name and/or Ownership: This permit is issued to **Schering-Plough Products, L.L.C., Manatí Operations.** In the event that the company and/or facility changes its name or is transferred to a different owner, the new responsible official must submit a sworn statement accepting and agreeing to comply with all the conditions of this permit.

30. Renovation/Demolition Work: Schering shall comply with the applicable provisions set forth in 40 CFR section 61.145 and section 61.150, and Rule 422 of the RCAP when conducting any renovation or demolition activities with asbestos containing materials at the facility.

31. Risk Management Plan: If during the effectiveness of this permit, **Schering-Plough Products, L.L.C. Manatí Operations** remains subject to 40 CFR part 68, the permittee shall submit a compliance certification with the requirements of part 68 as part of the annual compliance certification, including the recordkeeping and the Risk Management Plan. **Schering-Plough Products, L.L.C. Manatí Operations** shall comply with the requirements of the general obligation under section 112(r)(1) of the Act as follows:

a. Schering shall design, maintain and operate a safe facility.

b. Schreing has the general obligation of identifying hazards which may result from accidental releases of any controlled substance under section 112(r) of the Clean Air Act or any other extremely hazardous substance in a process, using generally accepted assessment techniques. Schering shall also take the appropriate steps to prevent releases and minimize the consequences of accidental releases, as required in section 112(r)(1) of the Clean Air Act and Rule 107(D) of the RCAP.

c. Schering shall submit an annual certification assuring the adequate implementation of a Risk Management Plan pursuant to Rule 604(e)(1)(ii) of the RCAP and 40 CFR section 68.215(a)(2)(ii).

d. Schering shall revise and update its Risk Management Plan submitted under 40 CFR section 68.150 as follows:

1) Within five years of it initial submission or the most recent update required in paragraphs (d)(2) to (d)(7) of this permit condition, as established in part 68, subpart G, section 68.190, whichever occurs later.

2) No later than three years after a new regulated substance is included for the first time in the list of substances regulated by the Environmental Protection Agency.

3) No later than the date on which a new regulated substance is present for the first time in an already authorized process and it exceeds the threshold amount.

4) No later than the date on which a new regulated substance is present for the first time and it exceeds the threshold amount in a new process.

5) Within six months of a change that requires a revision of the Process Hazard Analysis or a hazard revision.

6) Within six month after a change that requires a revision of the Off-site Consequence Analysis as provided in section 68.36.

7) Within six months after a change that alters the Program level that applied to any covered process.

e. In the event that this facility was no longer covered by part 68, subpart G, Schering shall submit a revised record to the EPA within six months indicating that the stationary sources is no longer affected by the same.

31. Requirements for Refrigerants (Climatologic and Stratospheric Ozone Protection):

a) In the event that the permittee has equipment or appliances, including air conditioning units, which use Class I or II refrigerants as defined in 40 CFR part 82, subpart A, Appendices A and B, the permittee shall provide maintenance, service or repair services according to the practices, personnel certification requirements, disposal requirements, and recycling and/or

recovery equipment certification requirements specified under 40 CFR part 82, subpart F. Owners or operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to section 82.166.

b) Service on Motor Vehicles: If the permittee performs a service on motor vehicles when this service involves ozone-depleting substance refrigerant (or regulated substitute substance) in the motor vehicle air conditioner (MVAC), the permittee shall comply with all the applicable requirements as specified in 40 CFR part 82, subpart B, Servicing of Motor Vehicle Air Conditioners. The term MVAC as used in subpart B does not include the airtight sealed refrigeration system used as refrigerated cargo or system used on passenger buses using HCFC-22 refrigerant.

32. Labeling of Products Using Ozone-Depleting Substances: The permittee shall comply with the standards for labeling of products using ozone-depleting substances pursuant to 40 CFR part 82, subpart E.

a) All containers in which a class I or class II substance is stored or transported, all products containing a class I substance, and all products directly manufactured with a class I substance must bear the required warning statement if it is being introduced into interstate commerce pursuant to section 82.106.

b) The placement of the required warning statement must comply with the requirements pursuant to section 82.108.

c) The form of the label bearing the required warning statement must comply with the requirements pursuant to section 82.110.

d) No person may modify, remove, or interfere with the required warning statement except as described in section 82.112.

33. Emergency Power Plant

a) The operation of each power plant listed as insignificant activity is limited to 500 hours per year.
b) The permittee shall keep a record of hours of operation and fuel used by each power plant. This record shall be available for Board and EPA personnel inspection.

34. Compliance Clause: Under no circumstances does compliance with this permit exempt the permittee from complying with all other applicable state or federal laws, regulations, permits, administrative orders or applicable court orders.

35. Emissions Calculations: The permittee shall submit, on the 1st day of April each year, the actual or permissible emissions calculations for the previous natural year. The emissions calculations must be submitted on the forms prepared by the Board for this purpose and the responsible official shall certify all the information submitted as true, correct and

representative of the permitted activity. On or before June 30 of each year, the permittee shall make the applicable payment for the emissions occurred during the previous calendar year.

36. **Annual fee:** The permittee shall submit an annual payment based on the actual emissions of regulated pollutants at a rate of $37.00 per ton, unless the Board establishes another fee pursuant to the provisions of Rule 610(b)(2)(iv) of the RCAP. This payment must be made on or before June 30 of each year.

39. **Roof Surface Coating:** As specified in Rule 424 of the RCAP, Schering shall not cause or permit roof surface coating by applying hot tar or any other coating material containing organic compounds without the EQB's previous authorization. The use of used oil or hazardous waste for surface coating is strictly prohibited. This rule will not apply to activities where tar or sealing material is applied without heat and such material is asbestos-free. [This is a state-only requirement]

40. **Storage Tanks:** Schering shall keep the records of the distilled fuel (diesel) storage tanks listed as insignificant activities showing each tank's capacities as specified under 40 CFR section 60.116b. Said documentation shall be available for Board technical personnel review at all times and kept in the facility for the life of each tank.

41. **New or Amended Regulations:** In the event that a federal or state regulation is promulgated or amended and the facility is affected by it, the permittee shall comply with the requirements of the new or amended regulation after it is in effect.

Section IV - Emission Limits

The permittee may not exceed the emission limits described below for any 12 consecutive month period. The emissions for any 12 consecutive month period will be calculated by adding the monthly emission limit of each unit to the total emissions of the units during the 11 preceding months.

Criterion Pollutant	Emission Limit (tons /year)
PM_{10}	55
SO_2	930
NO_x	175
CO	24
VOC	28

Hazardous Atmospheric Pollutant (HAPs)	Emission Limit (tons /year)
HAP Combination	**23.4**
Chloroform	**9.2**
Methylene Chloride	**9.2**
Methanol	**6.0**
Other HAP (aggregate)	**1.0**

Section V- Permit Conditions

1. EC-001, EC-002, EC-004-012, EC-014-036, EC-038-054, EC-056-074, EC 076-077, EC 080-094, EC-096-098, EC-102-107 and EC 109-111

Condition	Parameter	Value	Units	Test Method	Method Frequency	Recording Requirements	Reporting Frequency
VOC emission limit	VOC	3	Pounds per hour	N/A	N/A	N/A	N/A
		15	Pounds per day				

a. VOC Emission Limits

i. In accordance with Rule 419 of the RCAP, the permittee may not allow VOC emissions of 3 pounds per hour or 15 pounds per day in any article, machine, equipment or any other apparatus if said equipment does not have an acceptable control system, an emission reduction, prevention program or mechanism, or both, as approved or required by the Board.

b. Manufacture Emission Limit

1. This permit contains conditions that limit **Schering-Plough Products, L.L.C. Manatí Operations** potential HAP emissions to the amounts indicated in Section IV. **Schering-Plough Products, L.L.C. Manatí Operations** may not exceed emission limits during any 12 consecutive month period. The emissions for any 12 consecutive month period will be calculated by adding the monthly emissions of each unit to the total emissions of the units for the 11 preceding months.

2. HAP emissions coming from these emission units will be controlled by the carbon adsorption unit (CD-631-3291).[PFE-47-0802-1267-I-II-C]

3. The permittee shall keep a monthly estimate of emissions through this equipment based on the TOC (total organic compounds) readings of an FID (Flame Ionization Detector) type analyzer that will be calibrated every six months using methane. The total pounds of methane will be tallied every 365

days and an equivalent amount of HAP pounds will be calculated in keeping with the methods set forth in Appendix II.

4. The permittee shall inspect and provide maintenance in unit (CD-631-3291) in accordance with the manufacturer recommendations. The permittee shall keep records of maintenance provided to the control equipment at the facility at all times for Board technical personnel review or submission to the Board when required to do so. [PFE-47-0802-1267-I-II-C]

5. The permittee shall provide a temperature indicator to monitor temperatures at the CD-641-0000 unit. This temperature indicator shall be accurate within 2% of the temperature measured in Celsius degrees or ±2.5°C, whichever is greater.[PFE-47-0802-1267-I-II-C]

6. The permittee shall provide a regeneration flow meter at unit CD-631-3291 capable of recording the total regeneration flow within ±10% of the established value (e.g. accurate within ±10% of the reading).[PFE-47-0802-1267-I-II-C]

7. The temperature indicator and the flow meter of unit CD-631.3291 will be calibrated every 12 months. The permittee shall keep calibration records or documents available at the facility at all times for Board personnel review or submission to the Board when required to do so.[PFE-47-0802-1267-I-II-C]

8. The permittee shall check the carbon bed of unit CD-641-0000 every 12 months for poisoning in accordance with manufacturer specifications. The permittee shall keep the records or documents relative to this check available at the facility at all times for Board personnel review or submission to the Board when required to do so. [PFE-47-0802-1267-I-II-C]

9. The continuous emissions monitoring system (CEMS) shall meet all the EPA performance monitoring specifications including, but not limited to the following:

   a. 40 CFR part 60.13,

   b. 40 CFR part 60, Appendix A, Method 25A, Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer,

   c. 40 CFR part 60, Appendix A, Method 25A, Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer,

   d. 40 CFR part 60, Appendix B, Performance Specifications 8

   e. 40 CFR part 60, Appendix F, Quality Assurance Procedures.

10. **Schering-Plough Products, L.L.C. Manatí Operations** shall install, calibrate and maintain CEMS in accordance with 40 CFR subpart A, section 63.8. The permittee shall perform quarterly audits of the gas cylinders during calibration of CEMS.

11. **Schering-Plough Products, L.L.C. Manatí Operations** shall sample the concentration of HAPs every 15 minutes at the CAU exit, and shall prepare and keep a logbook of those concentrations. The logbook will be available at the facility at all times for Board personnel review or submission to the Board when required to do so.

12. **Schering-Plough Products, L.L.C. Manatí Operations** shall prepare and keep the following records during the periods when the CEMS is out of service:

    a. Specific identification of all measures required by the CEMS (including sampling data recorded during this period).

    b. The time and date of the periods.

    c. The nature and cause of the periods.

    d. The corrective measures taken at the CEMS during those periods.

13. In the event that the CEMS is not operating, **Schering-Plough Products, L.L.C. Manatí Operations** shall use the average of concentrations before and after the period during which the CEMS is in shutdown to estimate losses corresponding to that period.

14. The permittee shall keep a monthly logbook with the following information on the batches produced at the facility:

    a. The name of processed batches that emit HAPs to the CAU.

    b. The number and size of batches produced per month.

    c. The starting and completion date of each batch.

    d. The identification and quantity of controlled and uncontrolled atmospheric pollutants emitted per batch for each process.

    e. The gas flow rate record at the CAU.

    f. A record of the uncontrolled HAP and VOC emissions per processed batch calculated using the equations of the *Control Techniques Guidelines* (CTG) of 1978 and Best Engineering Practices.

g. A record of the changes in the facility manufacture processes.

h. A record of the calculations used to estimate emissions during the cleaning or validation processes.

i. A CEMS reading-based record of the monthly estimate of controlled emissions by the CAU in terms of pounds of methane.

j. A record of CEMS calibrations and readings.

k. A record of the calculation of fugitive emissions using as a basis the estimates of the 1996 study or any other subsequent estimate of fugitive emissions.

l. A record of loading solvent into storage tanks.

m. A record of the physical characteristics of storage tanks pursuant to the TANKS Program, including stored solvent, amount added in gallons each month and pressure parameters for tanks conservation vents.

n. A report of the annual runs of the TANKS Program.

o. The loading records of the solution charged into the scrubbers and recirculation flow rate.

p. Schering shall use other method to calculate the fugitive emissions if the methods area accepted by EQB or EPA.

15. **Schering-Plough Products, L.L.C. Manatí Operations** shall use the most recent version of the TANKS program to estimate tank losses on CAU controlled grounds. **Schering** shall also use engineering estimates to assess other losses.

C Scrubbers Operation Parameters

Below is a list of scrubbers' operation parameters.

Control Unit	Caustic Solutions	Initial Caustic Solution Concentration (pH)	Minimum Operating Concentration (pH)	Minimum Operating Flow (gallons / minute)
Packed Scrubber DOH-H 631-3401	Potassium Carbonate	> 12	4	≥ 30
Packed Scrubber DOH-E 631-3402	Sodium Sulfite	> 9	4	≥ 30
	Sodium Bisulfite	> 9		
	Sodium Carbonate	> 12		
	Calcium Carbonate	> 12		
	Sodium Hydroxide	> 12		
Packed Scrubber DOH-AB 631-3291	Sodium Sulfite	> 9	4	≥ 3
	Calcium Carbonate	> 12		
	Sodium Hydroxide	> 12		

1. The permittee shall inspect and give maintenance to the scrubbers in accordance with the manufacturer recommendations. The permittee shall provide equipment to monitor the following parameters in order to ensure adequate operating conditions:

    a. Minimum flow rate of caustic solutions (as indicated in the above table)

    b. pH (initial caustic solution concentration and minimum operating concentration as indicated in the above table)

.

2. The permittee shall install a flow meter in each scrubber to check the units operating parameters. The installed flow meter must be certified by the manufacturer and must be accurate within ±10% of the scrubber design flow.

3. The minimum flow rate shall be equal to, or above the limit value listed in the table in this section. The flow rate shall be kept during the operation of the scrubbers.

4. The permittee shall record the flow in the scrubbers every 4 hours during their operation.

5. The permittee shall calibrate each unit's flow meter every 12 months and keep calibration records or documents available at the facility at all times for Board personnel review or submission to the Board when required to do so.

6. The minimum pH level of the scrubbers recirculated liquid shall be equal to, or above the limit value listed in the above table. The minimum pH level shall be kept during the scrubbers operation.

7. The permittee shall record the pH of the scrubbers effluents every four hours during the production of each batch. The solution used shall be changed when the pH is equal to 4 or when a new batch begins to be processed, whichever occurs first.

8. The permittee shall keep a monthly record of maintenance provided to each control equipment. Said record shall be kept at the facility at all times for Board personnel review or submission to the Board when required to do so.

9. The permittee shall do a monthly estimate, within a revolving 12-month period, of pre-control emissions as specified in the methodology (General Method) described in Appendix II.

10. The permittee shall keep a monthly logbook with the following information on the batches produced at the facility:

    a. The name of batches processed at the Bay DOH-AB that emit HAPs to the CAU.

    b. The name of batches processed at Bays DOH-AB, DOH-E and DOH-H that emit HAPs to scrubbers CD-631-3291, CD-631-3402 and CD-631-3401, respectively.

    c. The number and size of each batch.

    d. The starting and completion date of each batch.

    e. The identification and quantity of controlled and uncontrolled atmospheric pollutants emitted per batch for each process.

D Equipment (Fermenter, methanol charge tanks and vacuum pumps)

1. The permittee shall keep a monthly logbook with the following information on the batches produced in the equipment included in this emission unit:

    a. The name of the processed batches that emit HAPs to the CAU.

    b. The number and size of each batch.

c. The starting and completion date of each batch.

d. The identification and quantity of controlled and uncontrolled atmospheric pollutants emitted by batch for each process.

2. The permittee shall use the best engineering practices and emission equations to estimate environmental losses as specified in Appendix II, when the emission unit is not directly related to manufacture batches.

3. The permittee shall have available a monthly estimate, on a 12-month revolving basis, of the emissions of the equipment included in this emission unit, as specified under the General Method described in Appendix II.

E- Tanks

1. At all times, the permittee shall keep a logbook indicating: the tank's identification, the product or substance stored in the tank, the date on which the substance was first stored, and the date and the findings of the inspections.

2. The permittee shall visually inspect the tanks at least once a year to try to identify defects that may result in air emissions of hazardous atmospheric pollutants.

F Fugitive Emissions Limit

1. Annual emissions shall meet the emission standards for pharmaceutical production processes components in methylene chloride or carbon tetrachloride service, established in 40 CFR sections 63.163-63.190 (subparts H and I), referred to as SOCMI HON. This regulation applies to the following equipments that are in organic hazardous atmospheric pollutants service for 300 or more hours per year:

a. Pumps
b. Compressors
c. Agitators
d. pressure relief devices
e. sampling connection systems
f. open-ended valves or lines
g. valves
h. connectors
i. surge control vessels
j. bottoms receivers
k. instrumentation systems
l. control devices

2. The permittee shall prepare a Leak Detection and Repair Program (LDAR) that complies with the requirements established in 40 CFR part 63, subpart H and I.

Compliance will be determined through review of records and reports, review of performance tests results, and inspections.

3. The permittee shall comply with all monitoring and servicing requirements established in 40 CFR parts 63.163 to 174.

4. The permittee shall comply with all test methods and procedures established in 40 CFR part 63.180.

5. The permittee shall comply with all the recordkeeping requirements established in 40 CFR part 63.181.

6. The permittee shall comply with all the reporting requirements established in 40 CFR part 63.182.

7. In accordance with the methodology described in Appendix II, the permittee shall record on a monthly basis the number of processed batches and the calculation of fugitive emissions using the emission factor developed by batch in the 1996 study.

8. If the status of the facility changed so that it would no longer be subject to SOCMI HON (it no longer used methylene chloride, or it is not used in processes covered by SOCMI HON) the facility shall continue implementing the SOCMI HON leak detection and repair program. **Schering-Plough Products, L.L.C. Manatí Operations** may submit a written consultation requesting a final determination from the EPA and the Board on this matter.

G- Reports

1. **Schering-Plough Products, L.L.C. Manatí Operations** shall submit an annual emissions certification report, including all the emission units in the facility, that shall be submitted within the first 60 days after the anniversary of the permit issuance. The annual emissions certification report shall extend for the 12 consecutive months following the date of the permit anniversary.

2. The annual emissions certification report shall include, but not be limited to the following:

   a. Emission calculation for each emission source;

   b. Copy of all the runs generated by the *TANKS* program;

   c. A summary of the criteria pollutants emissions for the facility (ton/year);

   d. List and identification of each hazardous atmospheric pollutant emitted;

   e. Total of each hazardous atmospheric pollutant emitted (ton/year);

f. Amounts of chloroform, methanol, methylene chloride, acetaldehyde, dimethylformamide, hydrogen chloride and triethylamine purchased during the year;

g. Name, identification and amount of batches produced during the year;

h. Total fuel (diesel and gas) consumption for the facility;

i. Hours of operation of the cogeneration engines, the boilers, the power plants and the fire pumps;

j. The compliance status certification of the facility;

k. Any other fact that the EQB may require; and

2. EC-121- Three 35 MMBtu/Hr industrial boilers

Condition	Parameter	Value	Units	Test Method	Method Frequency	Recordkeeping Requirements	Reporting Frequency
Opacity Limit Rule 301 of the RCAP	Opacity	20%	6-minute average percent	Method 9 Visible Emissions	Once during the first year of the permit Weekly	For every reading Daily	60 per day, for each reading
Emission limit for fuel burning equipment Rule 410 of the RCAP	PM	0.3	Pounds per million Btu	Chimney sampling using Method 5 or Method 17	Once during the first year	Logbook Recording of sampling results	60 days after the sampling
Limit for sulfur content of fuel Rule 410 of the RCAP	Sulfur Content	2.5	Percentage per weight	Analysis by the fuel supplier upon each delivery	Every time fuel is received.	Daily	Monthly
Fuel consumption limit	Fuel Consumption #6	4,730,400	gals/year	Consumption	Monthly	Monthly recording of fuel consumption	Annual

a. Particulate Matter Emission Limit:

i. The permittee may not cause or allow particulate matter emission exceeding 0.3 pounds per million Btu of heat.

ii. To show compliance with the above condition, the permittee will use any of the following methods:

a. Stack sampling:

1. *Schering* shall conduct a sampling during the first year of the permit using Method 5 or Method 17 in 40 CFR, part 60, Appendix A.

2. *Schering* shall submit for Board approval a sampling protocol at least 30 days before conducting the sampling. This protocol must contain the information described in Rule 106(C) of the Regulation for the Control of Atmospheric Pollution (RCAP).

3. *Schering* shall notify the Board in writing 15 days before conducting the sampling to allow the Board the opportunity to have an observer present. [Rule 106 (D) of the RCAP]

4. *Schering* shall submit two copies of the sampling results report within 60 days after the tests are completed. This report will have the information required under Rule 106 (E) of the RCAP.

5. During the tests, the source must be operating at full capacity or based on a representative performance of the affected facility at the time of the sampling; provided, after compliance with any applicable emission limit has been proven, the Board may restrict the operation of the source to the capacity reached during the performance tests. [Rule 106 (F) of the RCAP]

b. Fuel supplier certification of sulfur content.

1. Schering shall keep records of the type, actual use and sulfur percentage in the fuel, certified by this unit's supplier.

2. Schering shall use the most recent AP-42 emission factors together with the fuel use and sulfur content records to calculate the particulate matter emissions and show compliance with the particulate matter limit established in the above table. EPA's AP-42 Emission factors: *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Office of Air Quality Planning and Standards*

b. Visible Emissions Limit:

i. *Schering* shall conduct weekly visual opacity inspections during daytime hours using a Visible Emissions Reader certified by an EPA- or EQB-approved program. When the certified reader establishes that the opacity limit is being exceeded under Rule 403 of the RCAP, Schering shall check that the equipment and control equipment causing the visible emissions is operating in accordance with the manufacturer specifications and the permit conditions. If it is not performing adequately, Schering shall take immediate corrective actions to eliminate the opacity excess.

ii. *Schering* shall retain an independent opacity reader, certified by an EPA-approved school to take an opacity reading during the first year of the permit using the Method 9 established in 40 CFR part 60, Appendix A.

iii. Schering shall submit for Board approval a sampling protocol at least 30 days before conducting the sampling. This protocol must contain the information described in Rule 106(C) of the Regulation for the Control of Atmospheric Pollution (RCAP).

iv. Schering shall notify the Board in writing 15 days before conducting the sampling to allow the Board the opportunity to have an observer present. [Rule 106 (D) of the RCAP]

v. Schering shall submit a final report within 60 after the date the sampling has been completed. [Rule 106 (E) of the RCAP].

vi. Schering shall submit to the EQB and the EPA a copy of the readings report on opacity emissions 60 days after the reading.

vii. According to Rule 603(a)(4)(ii) of the RCAP, *Schering* shall keep in the records all the required sampling data and the support information for a 5-year period beginning on the date of the monitoring sample, measurement, report or application. This includes a record of the readings of visible emissions, containing the dates and times of the readings.

viii. The Board reserves the right to demand additional readings of opacity lectures in order to show compliance with the opacity limit.

c. Fuel Consumption Limit:

i. The fuel to be used in each of the three 35 MMBtu/hr boilers is limited to fuel No. 6. Two boilers may be operated simultaneously and total fuel consumption for these sources may not exceed 4,730,400 gallons per year in any consecutive 365-day period. The content of sulfur in the oxidized fuel may not exceed 2.5% per weight. [PFE-47-0802-1267-I-II-C]

ii. Fuel consumption for any revolving 365-day period will be calculated by adding the units daily fuel consumption to the total fuel consumed by the units during the preceding 364 days. [PFE-47-0802-1267-I-II-C]

iii. Within the first 90 days beginning on the effective date of this permit, Schering shall install and operate a fuel flow meter in the boilers. The flow meter will be calibrated every six months in accordance with the manufacturer recommendations. Schering shall prepare and maintain a record including the calibration date, time, methodology used, and results for Board technical personnel inspection. Alternately, *Schering* may request in writing another equivalent method to measure fuel consumption for the

Board evaluation and approval. The request for an alternate method must be made within the period granted for the installation of a flow meter.

iv. Schering shall keep the results and methodology of the flow meter calibrations for the combustion unit for at least 5 years, in accordance with Rule 603(a)(4)(ii) of the RCAP.

iv. The permittee shall submit each year, together with the annual compliance certification, a copy of the monthly and annual fuel consumption reports of the boiler corresponding to the report year.

v. *Schering* shall keep a daily record including the boilers' hours of operation and fuel consumption. [PFE-47-0802-1267-I-II-C]

d. SO_2 Emission Limit:

i. The sulfur content of the fuel burned by the three boilers may not exceed 2.5 percent per weight. [PFE-47-0802-1267-I-II-C]

ii. *Schering* shall keep a document certified by the supplier indicating the sulfur content of the fuel in order to meet the daily recordkeeping requirement of the sulfur content of burned fuel. *Schering* shall obtain an analysis of the sulfur content upon every fuel delivery using the ASTM Method 4294 or ASTM Method 2880-71.

iii. *Schering* shall submit each year, together with the annual compliance certification, a copy of the reports for that year indicating the fuel consumption, sulfur content of burned fuel in percentage per weight and the amount of SO_2 emissions in tons per year. *Schering* shall also submit sampling reports, which must contain the following:

a. the date, place (as defined in the permit) and time of the sampling,
b. the date on which the analysis were conducted,
c. the company or entity that conducted said analysis,
d. the analytical methods or techniques used,
e. the results of those analysis, and
f. the operating conditions at the time of the sampling.

iv. *Schering* shall keep the records of all the required sampling data and support information for a 5-year period beginning on the date of the monitoring sample, measurement, report or application. This includes a record of the sampling results of fuel and sulfur content of burned fuel in accordance with Rule 603(a)(4)(ii) of the RCAP.

vi. *Schering* shall deliver to the Board a monthly report indicating the daily fuel consumption and the sulfur content of fuel in percentage per weight. This report must be delivered to the Board no later than 15 days after the month that is represented in the report. The report must be addressed to the Data Validation and Management

Division and shall be available for EPA and Board technical personnel review at the facility at all times. [Rule 410 of the RCAP]

3. EC-122 – Five Power Plants (261-6500, 443-6500, 443-6501, 533-6500, 631-6500)

Condition	Parameter	Value	Units	Compliance Method	Method Frequency	Recordkeeping Requirements	Reporting Frequency
Particulate matter emission limit	Particulate Matter	0.3	Pounds per Million Btu	Chimney Test using 40 CFR, part 60, Appendix A, Method 5.	Within the first year of the permit.	Keep a copy of the final report for a 5-year period beginning on the date of the report [Rule 603 (A)(4)(ii)].	60 days after the date of the sampling.
SO_2 Emission Limit	Sulfur content	0.5	Percentage per weight	Supplier Certification	Every time fuel is received.	Sulfur Percentage Record	Monthly
Fuel Consumption	Diesel Fuel EP-261-6500(400Hp) EP-443-6500(670Hp) EP-443-6501(670Hp) EP-533-6500 (670 Hp) EP-631-6500 (1,000Hp)	262,800 350,400 438,000	Gallons/year	Flow meter	Calculate monthly consumption.	Daily record of fuel consumption.	Monthly
Visible Emissions	Visible Emissions	20	6-minute average percent	Method 9 Inspection of visible emissions	Once during the first year of the permit. Daily	Visible emissions readings.	60 days after each reading.

1- PARTICULATE MATTER LIMIT

(A) The permittee may not cause or allow particulate matter emissions in excess of 0.3 pounds per million Btu of heat supplied, coming from any equipment for burning solid or liquid fuel.

(B) The permittee shall conduct a sampling during the first year of the permit to determine compliance with the standard, using 40 CFR 60, Appendix A, Method 5.

(C) In accordance with Rule 106 (C) of the RCAP, the permittee shall submit a sampling protocol at least 30 days before testing begins.

(D) The permittee shall submit a written notification 15 days before conducting the test to allow the Board to appoint an observer. [Rule 106 (D) of the RCAP]

(E) In accordance with Rule 106 (E) of the RCAP, the permittee shall submit a final report within 60 days after the emissions sampling.

(F) In accordance with Rule 603 (A)(4)(ii) of the RCAP, the permittee shall keep a copy of the final report for a five-year period beginning on the date of the sampling.

2. SO_2 EMISSION LIMIT

(A) In accordance with Rule 410 of the RCAP, the permittee shall only burn diesel fuel with a maximum of 0.5% sulfur content per weight.

(B) In accordance with Rule 603(A)(4)(ii) of the RCAP, the permittee shall retain the records of all required sampling data and the support information for a five-year period beginning on the date of the monitoring sample, measurement, report or application. This includes a record of the monthly reports on fuel consumption and sulfur content of burned fuels.

(C) The permittee shall submit, within the first 15 days of the month following the reported month, a monthly report indicating the fuel consumption and sulfur content by weight.

(D) In order to determine the sulfur percentage in the fuel, the permittee shall record the content of sulfur of the most recent fuel delivery and shall obtain a sulfur content analysis upon each delivery. The sulfur content in the fuel will be determined using the ASTM Method 4294 or ASTM Method 2880-71.

3- FUEL CONSUMPTION RATE LIMIT

(A) *Schering* shall not exceed the following diesel fuel consumption rate:

Emission Unit	Horsepower (Hp)	Consumption Rate (gal/yr)
261-6500	400	262,800
443-6500	670	350,400

443-6501		
631-6500	1000	438,000

at unit EC-122 for any consecutive 12-month period. In order to show compliance with this limit, the permittee shall keep a daily record of fuel consumption. [PFE-47-0802-1267-I-II-C]

Fuel consumption for any consecutive 12-month period shall be calculated by adding the total monthly fuel consumption for each unit during the 11 preceding months.

(B) The permittee shall install and operate fuel flow meters in the power plant. The fuel meters must be calibrated every six months or in accordance with the manufacturer's recommendations, whichever is less. The permittee shall keep the calibration results and methodology available at the facility for Board technical personnel review.

(C) In accordance with Rule 603(A)(4)(ii) of the RCAP, the permittee shall keep the records of all the required sampling data and support information for a five-year period beginning on the date of the monitoring sample, measurement, report or application. This includes a record of the monthly and annual fuel consumption reports for each combustion unit. The monthly compliance is determined by adding the total amount of fuel consumed during the preceding 11 months.

4- VISIBLE EMISSIONS LIMIT:

(A) **Schering** may not exceed the 20 percent opacity limit in a six-minute average. However, and in accordance with Rule 403 (A) of the RCAP, the permittee may emit visible emissions with opacity of up to 60 percent for a period of not more than four minutes within any consecutive 30-minute period.

(B) **Schering** shall conduct visible emissions readings using Method 9 established in 40 CFR 60, Appendix A, during the first year of the permit. The permittee shall retain an independent opacity reader duly certified by the EQB to conduct these tests.

(C) **Schering** shall make an opacity inspection, whenever the emission source is operating during the first year of the permit. These inspections shall consist of observing each chimney every day for a two-minute period to identify whether there are visible emissions, not due to water steam. The observer shall take a position at least 15 feet away, but not more than 0.25 miles away from the sources. Sunlight cannot shine directly on the eyes of the observer. If emissions are observed, the permittee shall do the following:

1) Verify that the equipment and/or control equipment causing the visible emissions is operating in accordance with the manufacturer specifications and permit conditions. If it is not operating adequately, corrective measures must be taken immediately to eliminate the opacity excess.

2) If the corrective actions do not correct the opacity problem in 24 hours, the permittee shall conduct a visible emissions reading using Method 9 established in 40 CFR, Appendix A. The permittee shall retain an independent opacity reader certified by the EQB to conduct these tests. The tests shall be conducted during every work shift until the problem has been corrected.

3) Any deviation must be reported to the Board within 24 hours.

Section VI- Insignificant Emission Units

The following list of insignificant activities was provided by the source for a better understanding of its operations. Because there is no requirement to update this list, the activities may have suffered changes since it was submitted.

Emission Unit Identification	Description (Criterion for exemption)
Fire pumps (343-3906 y 343-3902)	Appendix B, Section 3 (VI) of the RCAP.
Tank of less than 10,000 gallons capacity.	Appendix B, Section ii (N) of the RCAP.
VideoJet Ink Source	Appendix B, Section ii (P) of the RCAP.
Methylene Chloride Tank (5,000 gallons) (441-3203 y 441-3204)	Appendix B, Section ii (N) of the RCAP.
Gas (939-3101), Diesel (939-3102), and Tanks (939-3103)	Appendix B, Section xi of the RCAP.
Laboratories Waste	Appendix B, Section xxi of the RCAP.

Section VII- Permit Shield

As specified under Rule 603(D) of the RCAP, compliance with the conditions of the permit shall be deemed compliance with any applicable requirement identified in the permit and with any requirement identified as non-applicable to the source as of the date of permit issuance indicated below. Compliance with the conditions of the permit shall be deemed compliance with all the permits issued to Schering under Rules 203 and 204 of the RCAP [on the effective date of the permit].

A. **Non-Applicable Requirements**

Non Applicable Requirements		
State	**Federal**	**Reason**
40 CFR Part63, Subpart GGG		See Section VII Part B of this Permit

B. **Reasons for Non Applicability**

Coding for Non Applicability	
Code	**Reason**
40 CFR Part 63, Subpart GGG	Synthetic Minor Source Emission Certification in HAP's

Section VIII- Permit Approval

By virtue of the authority conferred upon the Environmental Quality Board by the Environmental Public Policy Act, Law No. 416, September 22, 2004, and after verifying the administrative record and compliance with the Uniform Administrative Procedure Act, Law No. 170, August 12, 1988, as amended, the Clean Air Act, the Environmental Public Policy Act and the Regulation for the Control of Atmospheric Pollution, the Environmental Quality Board approves this permit subject to all the terms and conditions herein established.

In San Juan, Puerto Rico, December 2, 2005.

ENVIRONMENTAL QUALITY BOARD

/s/ by Julio I. Rodríguez Colón
Eugene Scott Amy
Vice-president

/s/
Ángel O. Berríos Silvestre
Associate Member

/s/
Carlos W. López Freytes, Esq.
President

APPENDIXES

Appendix I - Definitions and Abbreviations

A. Definitions:

1. Act – Clean Air Act, as amended, 42 U.S.7401, et seq.

2. Responsible Official – See definition of "Responsible Official" as established in the Regulation for the Control of Atmospheric Pollution of the Environmental Quality Board (1995).

3. Regulation – Regulation for the Control of Atmospheric Pollution of the Environmental Quality Board.

4. Permittee – Person or entity to which the Environmental Quality Board has issued an Operating Permit for an Emission Sources covered under Title V.

5. Title V – Title V of the Clean Air Act (42 U.S.C. 7661).

B. Abbreviations

1. Btu – British thermal unit

2. CERCLA - Comprehensive Environmental Emergency Response, Compensation & Liability Act

3. CFR – Code of Federal Regulations

4. CO – Carbon Monoxide

5. EQB – Puerto Rico Environmental Quality Board

6. EPA – Environmental Protection Agency

7. HAP – Hazardous Atmospheric Pollutant

8. LDAR – Leak Detection and Repair

9. NAAQS – National Ambient Air Quality Standards

10. NESHAP – National Emission Standards for Hazardous Air Pollutants

11. NO_x – Nitrogen Oxides

12. PM_{10} – Particulate Matter less than or equal to 10 microns mass median aerodynamic diameter

13. PSD- Prevention of Significant Deterioration

14. RCAP – Regulation for the Control of Atmospheric Pollution of the Environmental Quality Board

15. RCRA – Resource Conservation and Recovery Act

16. SIC - Standard Industrial Classification

17. SO_2 – Sulfur Dioxide

18. SPNSS – Standards of Performance for New Stationary Sources

19. SSM - Startup, Shutdown and Malfunctions of operations

20. VOC – Volatile Organic Compound

Appendix II - Methodology for Calculations

Methodology for the Calculation of HAP Emissions

Schering-Plough Products, L.L.C., Manatí Operations (Schering), operates diverse emission sources of compounds regulated by the Clean Air Act and the Regulation for the Control of Atmospheric Pollutants (RCAP) of Puerto Rico. The Hazardous Atmospheric Pollutants (HAPs) are among the regulated compounds.

General Method

This method shall be used to estimate uncontrolled (pre-control equipment) air emissions of HAP or VOC (volatile organic compounds) type pollutants, which arise from the pharmaceutical manufacturing processes. These emissions shall be calculated monthly in tons per month for each individual HAP. The calculations shall be completed before the end of the following month. The emissions of the current month shall be added to the emissions of the preceding 11 months to attain an annual calculation of emissions (tons/year) for said revolving 12-month period. The permittee shall begin calculating monthly emissions on the month following the first full month of operations, after this permit is effective.

Schering-Plough shall follow the procedures described below to calculate monthly emissions.

Process Emissions (pre-control): VOC and HAP emissions shall be calculated for all process steps that have been operated at Schering facilities using the equations in the 1978 Control Techniques Guidelines (CTG) and the Best Engineering Practices. The information used in the CTG equations must include the amount of solvent charged into each reactor, as obtained from the process batch sheets. The estimated values per batch shall be used to calculate (pre-control equipment) monthly losses caused by the particular processes that have been completed during the preceding month. That is:

HAP/VOC Emissions per (pre-control equipment) Batch = Σ(Individual HAP/VOC Loss Lbs//Batch) x (no. of batches completed in the month)

Calculation examples have been included below.

Change Management: Process changes that may significantly change batch emissions shall be identified in advance of the change, using the management system for facility process changes. The information used in the CTG equations must then be modified to reflect the changes in manufacture processes. Schering-Plough shall keep records of the information on the processes and the calculations used for each step. Schering-Plough shall keep records of significant changes in the processes contained in the change management system. Records of the calculations used to estimate emissions during cleaning or validation processes must also be kept.

Sources Connected to Carbon Adsorption Unit (CAU), 641-0000

Schering operates a carbon adsorption system consisting of three beds each holding approximately 6,250 pounds of carbon. The CAU was designed to ensure a concentration of 50 ppm (as methane) at the exit. It receives approximately 800 to 1,000 cubic feet of process gases. This system maintains two beds in series at all times while the third bed is regenerated with steam and then stands by. If we enumerate the beds as 1, 2, and 3, during normal operation, bed 1 and 2 remain in series. Bed 1 receives process gases until it is saturated. At this time, bed 3 joins bed 2 in series (this last one was acting as polishing, because it was working in series) and bed 1 goes to regeneration and then stands by. At this time, bed 2 would be receiving the greater part of the process load and bed 3 would act as polishing.

Schering shall use the general method to estimate HAP and VOC uncontrolled (pre-control system) process emissions as indicated above. Then the distribution will be calculated in percentage per weight of each pollutant. That is, the total of each individual pollutant will be divided by their total sum at entry in the CAU.

Schering shall use continuous emissions monitoring system (CEMS) of an FID (Flame Ionization Detector) type, described in Attachment D, which will analyze samples taken from the CAU exit chimney. The continuous monitoring equipment must be certified in accordance to the procedures established in 40 CFR part 60, Appendix B. The CEMS must be calibrated using methane gas and a record must be kept of the concentration values and gas flow. Schering shall keep a monthly estimate of the emissions in terms of pounds of methane emitted through the CAU, based on CEMS readings. The total of methane equivalent pounds will be tallied monthly and an amount of equivalent HAP and VOC pounds shall be calculated. This calculation must be done as follows:

(1) it will be assumed that the monthly estimated HAP and VOC composition at the CAU entry will be equal to that at exit,

(2) percentages by weight of each component will be multiplied by the total equivalent pounds of methane calculated at exit, and

(3) equivalent methane pounds will be multiplied by the molecular weight ratios of the particular HAP or VOC compound divided by the molecular weight of methane. This calculation shall constitute HAP and VOC pounds emitted during the month in question.

HAP emissions to the environment during the current month will be added to the emissions for the 11 preceding months to obtain the total annual emission (tons/year) for each revolving 12-month period. **Schering-Plough Products, L.L.C. Manatí Operations** shall begin calculating monthly emissions on the month following the first month of operation, after this permit is effective.

Control requirements will be completely satisfied when:

- the sum of the individual HAPs from the sources described in this permit is equal or less than the following: 9.2 tons for chloroform, 9.2 tons for methylene chloride, 6.0 tons for methanol, 1.0 ton for each HAP (acetaldehyde, dimethylformamide, HCl and triethylamine).

- and the total sum of HAPs is 23.4 tons or less during revolving 365-day periods.

Calculation examples are given below.

Calculation Examples – Emissions through the CAU:

Example 1: Annual Calculation

Let us assume that a constant flow of 800 SCFM is recorded at the CAU exit chimney and an average concentration of 50 ppmv is measured throughout the year. The emission of substances in methane units can be estimated at 0.44 tons of methane (see Table 3), assuming that the estimated percentages per weight at entry in the CAU correspond to those of the gas at the CAU exit.

Table 2: Example of Calculation of Emissions using a CEM and the equivalents of several HAPs if these were alone in the discharge.

Volumetric Flow Rate =	800.0 SCFM
TOC (as Methane)	50.0 ppm
Molecular Weight =	16.0 lbs/lbs-mol

VOC mass rate

$$VOC(mer) = Q_{std} * Corr_3 * 60 * \left(\frac{0.0026 * PM}{10^6} \right)$$

$$VOC(mer) = 800 * 50 * 60 * \left(\frac{0.0026 * 16.0}{10^6} \right) = 0.10 lbs/hr = 0.44 ton/year$$

Chemical Substance	Formula	PM	Carbons	CEM (ppm)	Chimney Emissions (tons/year)
Methane	CH_4	16.04	1		0.44
Chloroform	$CHCl_3$	119.39	1		3.26
Methylene Chloride	CH_2Cl_2	84.94	1		2.32
Methanol	CH_3OH	32.04	1		0.88

Table 3 shows an example of this type of calculation for when the entry of gases to the carbon adsorption unit contains a mixture of HAP compounds and other compounds.

The results of Table 3 show how particular HAP emissions can be estimated at the CAU exit based on emissions estimates at CAU entry and the concentration measured as methane at the CAU exit.

Table 3: Example of the determination of the composition at the CAU exit when there is an estimate in methane units of 1.34 tons at exit and the annual charge at entry is estimated at 194 tons.

Component	Molecular Weight	CAU (entry)	Composition	CAU (exit)
Chloroform	119.39	47 ton/year	24.33	2.42
Methylene Chloride	84.94	71 ton/year	36.6	2.6
Methanol	32	43 ton/year	22.16	.59
Others (not HAPs)	25	33 ton/year	17.01	.36

Example 2: Monthly Calculation

Let us assume that during a particular month only three batch processes are operated and that their control equipment is the carbon adsorption system. Schering keeps the following record:

Month: November

Process	**Batch No.**	**Completion Date**
One	7008ONE-	11/21/
One	7009ONE-	11/23/
One	7010ONE-	11/24/
One	7011ONE-	11/25/
One	7012ONE-	11/26/
One	7013ONE-	11/27/
One	7014ONE-	11/28/
One	7015ONE-	11/29/
One	7016ONE-	11/30/
One	7017ONE-	11/31/
Two	7001TWO-	11/01/
Two	7002TWO-	11/03/
Two	7003TWO-	11/06/
Two	7004TWO-	11/11/
Two	7005TWO-	11/13/
Two	7006TWO	11/21/
Two	7007TWO-02	11/21/

In short, during the month of November, 10 batches of process **One** and 7 batches of process **Two** were completed.

For these processes, the following emission information is available after being estimated using the 1978 CTG and the Best Engineering Practices.

Pre-control Equipment

Process	Pollutant	Emission
One	Chloroform	1920.58
	Ethyl Acetate	11.41
	Methanol	32.04
Two	Methylene Chloride	166.807
	Ethyl Acetate	33.3
	Methanol	70.3
	Acetone	4.0

The monthly emission calculations (pre-control equipment) is obtained by multiplying the number of batches by the emissions per estimated loads.

Process	Pollutant	Pre-control Equipment Monthly Emission
One	Chloroform	19205.8
	Ethyl Acetate	114.1
	Methanol	l320.4
Two	Methylene Chloride	1167.65
	Ethyl Acetate	233.1
	Methanol	492.1
	Acetone	28.0

Then pollutant emissions are added and the composition is calculated in percentage by weight:

	Pounds for the month	% Weight
Chloroform	19,205.8	89.08
Ethyl Acetate	347.2	1.61
Methanol	812.5	3.77
Acetone	28.0	0.13
Methylene Chloride	1167.65	5.31
Total	**21,561.15**	**100%**

For purposes of this example, let us assume that the CEMS measures a constant concentration of 50 ppm (as methane) during the whole month and the flow through the CAU remains at 800 scfm. Using Table 3 of this section, we can see that this data corresponds to a loss of 1.0 pounds of methane per hour. The loss as methane can be calculated as follows:

(0.1 lbs of methane/hr) x 30 days x 24 hours = 72 pounds of methane

The equivalent losses for each pollutant can be estimated by multiplying the pounds of methane by the individual percentage of each gas at entry (it is assumed that the entry and exit compositions

remain constant) and multiplied by the pollutant's molecular weight ratio divided by methane's molecular weight):

chloroform (Lbs) = 72 Lbs methane x (.8908) * 119.39/16 = 478.59 Lbs
ethyl acetate (Lbs) = 72 Lbs methane x (0.0161) *88.11/16 = 6.38 Lbs
methanol (Lbs) = 72 Lbs methane x (0.0377) * 32.04/16 = 5.44 Lbs
acetone (Lbs) = 72 Lbs methane x (0.0013) *58.08/16 = 0.340 Lbs
methylene chloride (Lbs) = 72 Lbs methane x (0.0531) *84.94/16 = 20.30 Lbs

The tons of HAPs emitted through the CAU are:

= [(Lbs of chloroform) + (Lbs of methanol) + (Lbs of methylene chloride)]/2000
= [(478.59) + (5.44) + (20.30)]/2000 = 0.252 tons

The concentrations average before and after the period during which the CEMS is out of service will be used to estimate the losses corresponding to that period.

Sources connected to Scrubbers:

The general method shall be used to calculate each batch's pre-control emissions by load. Using control equipment efficiency data, HAP emissions will be calculated by multiplying the pre-control estimate by the inefficiency of the control equipment (inefficiency = 1 - Efficiency (fraction)).

Control requirements will be completely satisfied when:

- the sum of the individual HAPs of the sources described in this permit is equal or less than the following: 9.2 tons for chloroform, 9.2 tons for methylene chloride, 6.0 tons for methanol, 1.0 ton for each HAP (acetaldehyde, dimethylformamide, HCl and triethylamine).

- and the total sum of HAPs is 23.4 tons or less during revolving 365-day periods.

Storage Tanks

The equations of section 7.1 of AP-42, organic liquids or the most recent version of the EPA's Tanks Program are used to calculate the emissions lost by venting each solvent storage tank. The equations of the tanks program are the same as those in section 7.1 of AP-42. The stored solvent, the composition of stored material, the added amounts (gallons per period), the tanks physical dimensions and characteristics (for example, the tank diameter, isolation state, temperature according to data obtained from the National Weather Service, the pressure parameters of conservation vents) are entered to the TANKS program and to the AP-42 equations. **Schering-Plough Products, L.L.C. Manatí Operations** will calculate venting losses once per year assuming the worst case and will use these emissions for the following year. For example, venting losses will be calculated in January 2003 and used to estimate venting losses during the period from January 1, 2002 to December 31, 2002. The emissions calculated for venting losses for the year 2002 will be divided by 12 to obtain a venting loss monthly average (pounds of venting losses per year divided by 12 equals average monthly pounds). The documentation of worst-case assumptions (for example,

the type of solvent, the composition, the liquid height, the information used to enter data to the program and the reports) will be kept.

The emissions emitted during the delivery from truck tanks to solvent tanks will be calculated on a monthly basis. The uncontrolled emissions during loading operations will be calculated using the TANKS program. When the uncontrolled emissions of storage tanks are sent to a control at the end of the line, **Schering-Plough Products, L.L.C. Manatí Operations** shall use the procedures described in the foregoing section to calculate controlled emissions of the storage tanks. The actual emissions for venting losses will be calculated once every year.

Used Waters

Used waters containing VOCs or HAPs are sent from the process equipments (for example, reactors, filters, centrifuges) directly to the pre-treatment system. Used waters are accumulated in the covered pump stations (tanks) and pumped into the used water treatment system. **Schering-Plough Products, L.L.C. Manatí Operations** will keep a dry floor policy, meaning that used waters containing high levels of solvents will not be sent through open channels or through floor drainages or gravity sewers. These used waters will be sent through gravity drainages from the source to the pump station and then pumped into the equalization tanks before pretreatment. The transfers will take place through closed pipes.

The used water pretreatment system at the facility consists of a series of mixture and used waters accumulation tanks for a vapor stripping system, a chloroform destruction system (CDU), additional distillate collecting tanks and a series of mixing tanks and tanks for pH control of diluted used waters. All the tanks and process equipment are covered. The tanks containing high levels of solvents are vented to the CAU, which was previously discussed.

The worst-case estimates of solvent levels in used waters have been generated using analytical data and the knowledge of the process. Likewise, worst-case estimates of the flow rates of different currents of used waters will be developed. The emission rate of the worst case of daily mass will be multiplied by the number of operation days per year to determine the worst case of annual uncontrolled emissions.

All the assumptions and information will be documented and kept at the facility at all times.

Fugitive Emissions from Equipment Components

Fugitive emissions of HAP type pollutants from equipment must be calculated using specific emission factors for each type of component (for example, valves and connectors) as described in the *Guidance for Estimating Fugitive Emissions from Equipment* developed by the Chemical Manufacturers Association (which incorporated the protocols established by the EPA). These emission factors are stated in pounds/hour for type of component. Schering shall keep the supporting documentation showing the basis of the emission factors for each type of component. The number of components in each process step is determined by making a list of the equipment (for example,

reactor, storage tanks and filters) that are used in each step of the process and then reviewing the piping and instrumentation diagrams to establish the number of components in the configuration of the process equipments. The duration of each step (batch/hour) is established in the batch records. The emission factor for each process step (pounds/batch) is developed by multiplying the number of the different components in the process step by the emission factor of each component (pounds/hour) by the duration (hours) of each batch (batches/hour) to obtain an emission factor for each batch (batches/hour). A 1996 study will be used as basis for the calculation to establish fugitive emission factors per process (batch) and to calculate the fugitive emissions by multiplying the factor by the number of batches.

Schering-Plough Products, L.L.C. Manatí Operations shall calculate monthly HAP emissions from equipment releases for each process step by multiplying the emission factor of the process step (pounds/batch) by the number of batches produced in the month. Fugitive emissions for each process step operated during the month shall be added to obtain the total monthly fugitive emissions of the process steps. Below is a calculation example.

Example 3: Calculation of Fugitive Emission Losses (by batch)

The numbers of batches from Example 2 will be used for this example. That is, during the month of November 2002, 10 batches of process **One** and 7 batches of process **Two** were completed.

The emission factors for these processes are:

Process	**Pollutant**	Estimated Fugitive Emission (Lbs per Batch)
One	Chloroform	0.685
	Ethyl Acetate	4.837
	Methane	0.276
Two	Methylene Chloride	1.801
	Ethyl Acetate	1.062
	Methanol	3.563
	Acetone	0.106

chloroform (Lbs) = (0.685) x 10 = 6.85 Lbs
ethyl acetate (Lbs) = (4.837 x 10) + (1.062 x 7) = 55.804 Lbs
methanol (Lbs) = (0.786) x 10 + (3.563) x 7 = 32.801 Lbs
acetone (Lbs) = (0.106) x 7 = 0.742 Lbs
methylene chloride = (1.801) x 7 = 12.607 Lbs

The tons of HAPs emitted as fugitive emissions are:

[(Lbs chloroform) + (Lbs methanol) + (Lbs methylene chloride)]/2000 =
= [(6.85) + (32.801) + (12.607)]/2000 = 0.0261 tons

OTHER AREAS

Schering-Plough Products, L.L.C. Manatí Operations shall establish HAP emissions from the boilers, emergency power plants and fire pumps using the emission factors published in the AP-42. **Schering** shall cite the specific reference of the factor used in the calculations: gallonage, thermal value of fuel and sulfur content in percentage by weight for each unit. These calculations will be done monthly and a copy of the same, signed and sealed by a licensed engineer, must be sent with the Annual Compliance Report. The references for these factors must be kept in spreadsheets and hard copies must be submitted with the Annual Compliance Report.

Pollutants	Area	Calculation Frequency
HAP	Process Emissions	Monthly
	Solvent Recovery	Monthly
	Storage Tanks Loading	Monthly
	Storage Tank Venting	Monthly (annual worst case/12)
Combustion Products (HAPs)	Emergency Power Plants	Monthly
	Fugitive Emissions	Monthly
	Used Waters	Monthly (annual worst case/12)
	Utilities	Monthly

Appendix III - Continuous Emission Monitoring System (CEMS)

1) Schering-Plough shall keep a continuous monitoring system, FID (Flame Ionization Detector) type that will sample and analyze the emission through the Carbon Adsorption System (CAU, 641-0000). The sampling point will be located at the CAU exit chimney (EP-641-0000).

2) The continuous monitoring equipment will be certified in accordance with the procedures established in 40 CFR part 60, Appendix B, Performance Specification 8, Performance Specifications for Volatile Organic Compound Continuous Emission Monitoring Systems in Stationary Sources; 40 CFR 63.8, General Provisions, Monitoring Requirements; 40 CFR part 63, subpart GGG, National Emission Standards for Hazardous Air Pollutants for Pharmaceutical Production.

3) The procedures listed in Table 1 will be used for the certification tests.

Table 1: Certification Procedures for CEMS

Pollutant	Procedures for Certification Tests
THC (VOC)	• 40 CFR part 60, Appendix B, Performance Specification 8, Section 13, CEMS Relative Accuracy • 40 CFR part 60, Appendix B, Performance Specification 8, Section 13, CEMS Calibration Drift • 40 CFR part 60, Appendix A, Method 25A, Total Organic Gaseous Concentration Determination using an Flame Ionization Analyzer • 40 CFR part 63.8(e)(3)(i), General Provisions, Monitoring Requirements • 40 CFR part 60, Appendix F, Quality Assurance Procedures

4) Relative Accuracy (RA) tests will be conducted through direct comparison of permanently installed CEMS and results obtained using EPA reference methods. The results will be compared with the data obtained and the relative accuracy will be determined.

5) The compliance determination will be carried out by averaging the measured concentration emissions as methane at the carbon adsorption unit exit, calculated as equivalent HAP pounds during a 24-hour day (as described in Attachment C) and adding said emissions to those of the preceding 364 days.

6) Concentration measurements will be averaged every 15 minutes, every hour and for every 24-hour period.