PET
AP-42
Section 5.13.2
Reference Number
8

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE 19898

LEGAL DEPARTMENT

August 29, 1988

Mr. Jack R. Farmer, Director
Emission Standards Division
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

Dear Mr. Farmer:

We appreciate the opportunity to provide clarification or additional information regarding our comments on the new source performance standard (NSPS) for polyester manufacturers per your request.

The purpose of our comments on the proposed limit of glycol in the vacuum system condensate was to point out that a limit on the glycol in the condensate is not needed if the condensate is sent to an aerobic waste treatment system where it is biodegraded into harmless material before being released into the environment. The additional cost of sampling the condensate stream on a daily basis once a change is made for this type of system is a waste of resources as the glycol is biodegraded before being released into the environment. We recommend the limit on the amount of glycol in the vacuum condensate and the sampling requirement be eliminated for those systems that biologically treat the waste stream before releasing it to the environment.

Our reply to the question you asked in your enclosures one and two is attached.

Very truly yours,

Pamela Meitner

Pamela Meitner

PM:1.13
Attachments

A-1

Our interpretation of the NSPS was that it specified that the condensate be measured separately from the water used to cool the jets and condense the steam. Our comment was that we could not separate the condensate from the cooling water and that the glycol in the steam condensate would be diluted by the cooling water. The vacuum system is composed of a series of steam jets with condensers on the discharge side of the steam jet to cool the jets and condense the steam. The condensing stream, evacuated vapors and cooling water are mixed during the condensation process. It is not possible to sample the ethylene glycol concentration in the exit condensate stream from the vacuum system. The condensate and cooling water drain into a reservoir where it can be sampled.

A-2

In order to provide you a number for the ethylene glycol concentration in the aqueous stream going to the process waste treatment system, you need to understand that this is not a single stream. Each condensate stream merges with other waters as it is generated and loses its identity. However, by totaling the flows from individual condensate reservoirs, there is a total of about 350 gallons per minute of condensate waters generated. The concentration of ethylene glycol in each reservoir is about 0.04% by weight.

A-3

In the interest of water conservation, we began to install small cooling towers several years ago which allow us to recycle most of the condensate water. Some water has to be ditched routinely to control the accumulation of organics in the towers. This blow down is necessary because organics are not stripped in the towers, but accumulate in the water.

A-4

The total of about 350 gpm of condensate stream water is diluted throughout the system with other process waters to reach a total volume of about 1,750 to 1,800 gpm which enters the waste treatment system as a homogeneous solution. This creates a dilution factor of about 5. The concentration of glycol in the total plant stream is .008% by weight. The organics in these condensate streams are mostly ethylene glycol, with small amounts of methanol, and trace amounts of 1,4-dioxane and acetaldehyde.

B-1

The treatment system is composed of a 3.6 million gallon aeration cell, and two 0.5 million gallon clarifiers. This, combined with associated piping, creates a residence time of about 48 hours. As you know, when organic materials are placed in contact with a biomass, like activated sludge, almost all of it is rapidly absorbed into the biomass for subsequent assimilation. Also, this is a completely mixed system so what we measure in the effluent should be representative of what is in the aeration basin.

B-2

We do not routinely analyze the aeration basin since our permit is based on effluent parameters. However, the efficiency of our biological treatment system is greater than 90%. At this high level of efficiency, if we calculate the amount of ethylene glycol in the aeration basin, we could theoretically have less than 1 ppm in the aeration basin at any one time.

B-3

The tradewaste system operates at a temperature of 26-28 degrees centigrade. At this temperature, it is unlikely that any vapor pressure of the ethylene glycol can be measured.

C-1

Our waste treatment system biodegradation is greater than 90% efficient. At this efficiency, VOC emissions are too low to be measurable.

ENCLOSURE 2

A-1

99.8% of the emission stream from the material recovery section (methanol) is made up of methanol (33.27%), water (.26%), nitrogen (66.25%) and other organics (0.2%) by volume.

A-2

The temperature of the vent stream is 40°C and pressure is essentially atmospheric.

A-3

The flow rate of the vent stream is 9 $ft^3$/hour.

B-1

The vent stream characteristics do not vary significantly during startup from steady state conditions.

B-2

Water is generated as a by-product of the reaction between glycol and DMT. This source is common to the Du Pont plants. I am not sure about the PET industry.

B-3

The maximum level of water concentration that is acceptable to operate a condenser at -24°C is 90 ppm by volume.