Section VIII New Requirement for Annual Heat Load Report

Comment VIII.A:

Mirant comments that:

> As a new provision without a counterpart in the existing permit, Part I.A.7 of the Draft Permit proposes to require Mirant Canal to file a Heat Load Report for "at least three years" by January 31 for the prior calendar year. The report must include the net heat load for each hour of the past year according to a specified formula based on intake and discharge temperatures, must provide the amount of water discharged in each hour, and must follow a specified format.
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> Mirant Canal does not object to the gist of this proposal, but EPA should make three changes in the final permit.
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> First, the report should not be required after it has been filed for the three years. If EPA is unwilling to set a specific endpoint, the permit should provide the opportunity for Mirant Canal to request termination of this report once it has been filed for the three years.
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> Second, Mirant Canal requests February 28 as the due date for the reports, as EPA provided for the West Springfield Station in NPDES Permit No. MA0004707 issued on November 4, 2004. The extra month will lessen the burden of concurrent filings of many year-end reports by Mirant Canal for multiple other reasons.
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> Third, Part I.A.7.d of the Draft Permit specifies that the data must be provided separately for each Unit, and to facilitate that, n.2 on p. 8 of the draft permit specifies that the "discharge temperature" for purposes of calculating the hourly heat load shall be measured directly after each Unit condenser prior to mixing with any other stream. But measurement at those two points is precisely <u>not</u> a measurement of the thermal load discharged to the Canal. A "heat load report" based on measurements from the locations specified in n.2 would present an entirely inaccurate picture. Both because of the small amount of mixing with the other flows, and more importantly because of the cooling effects of the discharge flume, for Outfall 001, the main discharge, an accurate measurement of the thermal load to the Canal can only be taken at the <u>end</u> of the discharge flume. If the final permit retains a requirement for a heat load report, it should be revised to call for calculation of the actual thermal load to the Cape Cod Canal.

Response VIII.A:

EPA's intent was to require the facility to collect and submit three years worth of heat load data during the five year permit term. The permit wording has been modified to clarify this requirement. All data needed to calculate heat load is already collected by the facility. EPA does not expect this permit provision to be burdensome. In addition, EPA agrees to extend the

due date for the Annual Heat Load report to February 28th as requested. This change is reflected in the Final Permit.

EPA requested the heat load data for each Unit individually to determine the amount of water withdrawn for condenser cooling versus the amount withdrawn to meet NPDES permit limits for temperature. EPA agrees, however, that data collected from the end of the discharge flume will provide a more precise measurement of the thermal load discharged to the Canal from the facility and has changed the Final Permit accordingly.

The annual Heat Load Report is not required if the Permittee utilizes a closed-cycle cooling system for electrical generating Units 1 and 2 to achieve the standard specified in Part I.A.13.g of the Final Permit given the significant reduction in thermal load to the Cape Cod Canal from that technology. This provision has been added to the Final Permit (Part I.A.7.f).

In addition, in responding to these comments, EPA realized it had inadvertently failed to adjust the heat load equation for the salinity of ocean water. Specifically, the heat capacity of seawater is 0.94 BTU/pound °F[1] as opposed to the heat capacity of pure water which is 1.0 BTU/pound °F and the density of seawater is 8.55 pounds/gallon[2] as opposed to that of pure water which is 8.344 pounds/gallon. The heat load equation in the Final Permit is adjusted accordingly.

$Q = Cpm(\Delta T)$

Where Q = Heat Load, BTU/Hour
Cp = Heat Capacity (Specific Heat) of water with salinity of seawater = 0.94 BTU/pound °F
m = mass of water (discharged)
= flow rate x density of seawater
= flow rate, gallons per hour (gph) x 8.55 pounds/gallon
ΔT = discharge - intake temperature, °F

[1] See Fan Engineering Handbook, 8th edition, Appendix D, pg. D-5
[2] Ibid.