MEMORANDUM

STATE WATER CONTROL BOARD
Office of Environmental Research and Standards
4900 Cox Road Glen Allen, Virginia 23060

SUBJECT: Water Quality Standards Interpretation of Biologically Based Flows, Low Flow Application and Mixing Zones

TO: Larry W. Lawson, OWRM

FROM: Alan J. Anthony, OERS AJA

DATE: 2 November 1992

COPIES: Robert Burnley, Martin Ferguson, Fred Holt, Dale Phillips, OWRM; Jean Gregory, Elleanore Daub, Alex Barron, OERS

This is in response to your October 15, 1992 request to interpret several sections of the Water Quality Standards. I will respond to each question in the order they were presented.

1. Is the "once every three years" mentioned in notes 2 and 3 of page 22 of the standards meant to be the exactly equivalent to EPA's similar guidance of "once every three years on the average"?

YES - The phrase "on the average" is implied after footnotes 2 and 3 of VR 680-21-01.14.B of the regulation. This means that excursions are averaged for the entire flow record. In the past you have also asked us if the 4 day average is a discrete average or a running average. The 4 day average is a discrete average. For example, if we were calculating a design flow for a chronic water quality criterion using 30 years of flow data, then a biologically based flow would be chosen so that the total number of past occurrences of discrete 4-day average flows below this flow was as close to, but not greater than 30/3 or 10. EPA has a computer software package called DFLOW that calculates biologically based flows using the interpretations above. In addition, this software limits the length of time used to cluster the occurrences of 4-day average flows below the chosen design flow to 120 days. It also calculates the design flow such that no more than 5 excursions are counted within any 120-day cluster period.

2. VR680-21-01.4 is confusing. Based on past discussions with OERS personnel, past agency methods and EPA guidance, we believe that the intent of this section was to simply establish, by regulation, default design flows (those in VR680-21-01.4.A.1 and 2) to be used in simple steady state modeling but to allow other wasteload allocation techniques (stochastic modeling) to be used based on the statistics of

all flows in the entire gauging record. The question is: is this in fact the intent of section VR 680-21-01.4?

YES - VR680-21-01.4.A.1 and 2 would not apply at all in cases where an <u>acceptable</u> model is submitted.

3. May mixing zones be sized on the basis of the volume of water affected instead of simply based on width and/or cross sectional area?

YES - It is acceptable to implement the mixing zone using volume of water affected. This provides a simple method for permit writers to use in applying this requirement. However, there may be situations where a permittee could show this implementation method was incorrect and indeed, they should be given the opportunity to study their actual mixing and compare it to the requirements in VR680-21-01.2.C. On the other hand, if the SWCB discovered through monitoring or a special study that a permittee should have been limited by the width requirements rather than flow, then this situation should be corrected also.