

Phosphorus Criterion Monitoring Network White Paper

Paragraph (4)(b) of the rule divides the EPA into four water bodies for the purpose of determining achievement of the criterion and specifies that achievement of the criterion will be determined separately in impacted and unimpacted areas of each water body. The four water bodies were derived to be consistent with the general compartmentalization of the EPA. Since the goal in each of these water bodies is to maintain the unimpacted areas in that state, while measuring progress in the impacted areas toward becoming unimpacted, measuring these areas separately is consistent with that goal. It is also necessary to assess impacted and unimpacted areas independently to detect any potential expansion of impacted areas into unimpacted areas. However, the long-term geometric mean phosphorus criterion of 10 ppb applies equally in impacted and unimpacted areas throughout the EPA. Sites selected for inclusion in the ambient monitoring required by the phosphorus criterion rule will initially be designated as either impacted or unimpacted based on the 500 mg/kg soil P level as defined in Subsection (3) of the rule. As water quality data for the monitoring sites become available, the initial impacted or unimpacted designations will be refined based on the additional provisions in Paragraph (4)(d)2.c. of the rule.

The water quality monitoring required by the phosphorus criterion rule is meant to provide an assessment of the overall ambient phosphorus conditions within impacted and unimpacted areas of the EPA. The methodology for establishing appropriate networks of sites at which the required monitoring will be conducted is outlined below.

Unimpacted Areas

The phosphorus criterion rule specifies that: “Achievement of the criterion in unimpacted areas in each WCA shall be determined based upon data from stations that are evenly distributed and located in freshwater open water sloughs similar to the areas from which data were obtained to derive the phosphorus criterion”. Therefore, it is envisioned that monitoring sites will be distributed as evenly as possible over the unimpacted area within each conservation area. The exact number of monitoring sites will be based on the degree of variability observed for total phosphorus concentrations in that area using existing data. The monitoring network will incorporate existing SFWMD ambient and permit required monitoring sites wherever possible to take advantage of historical information and provide an extended period of record. Additional sites will be added as necessary to the existing monitoring sites to provide adequate spatial coverage of the entire area.

In evenly distributing the sites across the area, it is anticipated that some of the sites will be located near the impacted/unimpacted area boundary to protect against further expansion of impacted areas. Additionally, the rule indicates that as recovery occurs and the phosphorus concentrations at sites within the impacted-area monitoring network achieve the criterion, those sites will be incorporated into the unimpacted-area monitoring network. This will provide a continual assessment of sites near the impacted/unimpacted boundary.

Impacted Areas

The phosphorus criterion rule states that: “Achievement of the criterion shall be determined based on data collected monthly from the network of monitoring stations in the impacted area”. The impacted areas within a conservation area are frequently not continuous and generally occur around discharges to the area with the size and shape of the impacted area being dependent on

inflow volumes, phosphorus concentrations, and hydrologic conditions. Therefore, a monitoring network consisting of evenly distributed stations is not appropriate for the impacted areas. It is envisioned that the monitoring network of the impacted areas within each conservation area will consist of a minimum of five sites with the exact number and location of sites being based on the degree variability observed for total phosphorus concentrations in that area using existing data, the size of the impacted area, and the existing hydrologic conditions within the area. As for the unimpacted area, the impacted area monitoring network will incorporate existing SFWMD ambient and/or permit required monitoring sites wherever possible to take advantage of historical information and provide an extended period of record. Additional sites will likely need to be added to the existing monitoring sites to provide adequate spatial coverage of the entire area.

The rule specifies that as phosphorus concentrations at sites within the impacted-area monitoring network achieve the criterion, those sites will be incorporated into the unimpacted-area monitoring network. This will assure that the impacted and unimpacted monitoring networks are correctly designated throughout the recovery process.

Permit Required Monitoring

In addition to the ambient phosphorus concentration monitoring required to determine achievement of the phosphorus criterion in the impacted and unimpacted portions of each area within the EPA, permits for existing as well as any new discharges to the EPA will also require monitoring downstream of the inflow points as needed. In contrast to the ambient monitoring required to determine achievement of the phosphorus criterion, the permit required monitoring is meant to assess any potential impacts a specific discharge (especially a discharge not meeting water quality criteria) is having in the receiving waters. The information collected as part of the permit required monitoring will ultimately be used to establish the relationship between the water quality and volume of the discharge and the resulting conditions within the receiving waters, which relationship will then be used to establish future effluent limits for the discharge. It is anticipated that the permit required monitoring will be conducted at sites along a transect(s) located within the flow path for the discharge and extending from near the discharge point to a point outside the expected "zone of impact." If appropriate, the permit monitoring could include assessments of the biological health of the receiving waters downstream of the discharge in addition to water quality monitoring for phosphorus and other parameters of concern. Since the discharges across the EPA vary with regard to inflow volume, water quality, and hydrology, the specific monitoring requirements for each permit will be based on detailed, site-specific information.

As stated above, when possible and appropriate, the ambient phosphorus criterion monitoring networks should incorporate selected permit required monitoring sites (and vice versa) to avoid duplication of effort and to provide the most comprehensive information to satisfy the objectives of both types of monitoring.