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TO: Office of Drinking Water Staff

THROUGH: Thomas B. Gray, P.E., Director of Financial and
Construction Assistance Programs
Office of Drinking Water

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SUBJECT: Surveillance and Regulations – Turbidity Treatment Technique for Other
Filtration Technologies

Summary Statement

The *Waterworks Regulations* 12 VAC 5-590-420 Treatment Techniques, specifies turbidity limits for conventional and direct filtration (section B (2)a), for slow sand filtration (section B (2)b), and for diatomaceous earth filtration (section B (2)c). For the other filtration technologies that are allowed under the Surface Water Treatment Rule (membranes, bag filters, cartridge filters, etc.) the *Regulations* state in section B (2)d:

Other filtration technologies. A waterworks owner may use a filtration technology not listed in subdivisions 2 a through c of this subsection if the owner demonstrates to the division (by pilot plant studies or other means) that the alternative filtration technology, in combination with disinfection treatment, achieves 99.9% removal (3-log) and/or inactivation of Giardia lamblia cysts and 99.99% removal (4-log) and/or inactivation of viruses, and beginning January 1, 2002, for waterworks serving at least 10,000 people, 99% of Cryptosporidium oocysts. For a waterworks owner that makes this demonstration, a turbidity limit will be established by the commissioner, which the waterworks must meet at least 95% of the time. In addition, the commissioner will establish a maximum turbidity limit that the waterworks must not exceed at any time. These turbidity limits shall consistently achieve the removal rates and/or inactivation rates stated in this subdivision.

The purpose of this Working Memo is to establish the turbidity limits for other filtration technologies that are not specifically addressed in the *Waterworks Regulations*.

1. **New Proposals**

Any new proposal for a filtration technology other than conventional or direct filtration, slow sand filtration, or diatomaceous earth filtration must be designed to achieve a filtered water turbidity of less than or equal to 0.3 NTU in at least 95% of the measurements taken each month. Samples must be representative of the waterworks' filtered water. Additionally, the turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in 12VAC 5-590-440.

2. **Existing Facilities**

The Office of Drinking Water has previously approved several filtration technologies other than conventional or direct filtration, slow sand filtration, or diatomaceous earth filtration. These projects were approved under the 1995 version of the *Waterworks Regulations* that specified a turbidity treatment technique equal to that stated for slow sand filtration. This treatment technique indicates a turbidity level of representative samples of a waterworks' filtered water must be less than or equal to 1 NTU in at least 95% of the measurements taken each month, except that if the Office determines there is no significant interference with disinfection at a higher turbidity level, the Office may substitute this higher turbidity limit for that waterworks. The turbidity level of representative samples of a waterworks' filtered water shall at no time exceed five NTU.

Waterworks with previously approved filtration technologies other than conventional or direct filtration, slow sand filtration, or diatomaceous earth filtration will be allowed to operate under the 1995 turbidity treatment technique until January 14, 2005 (this date corresponds to the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) effective date of new turbidity limits for conventional and direct filtration water treatment facilities).

Beginning January 14, 2005, the turbidity treatment technique for any filtration technology other than slow sand filtration or diatomaceous earth filtration will be a filtered water turbidity of less than or equal to 0.3 NTU in at least 95% of the measurements taken each month. Additionally, the turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU.

