**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
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By Facsimile and Federal Express
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September 8, 2004

Jerry N. Johnson
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Gentlemen:

This responds to the District of Columbia Water and Sewer Authority's ("DCWASA") letters dated August 20, 2004 and August 30, 2004, regarding monitoring and reporting of water quality parameters ("WQPs") associated with the introduction of orthophosphate as a corrosion inhibitor in the District of Columbia drinking water system. By this letter, the U.S. Environmental Protection Agency Region III ("EPA") is directing that DCWASA immediately commence monitoring and reporting WQPs in conjunction with the revised optimal corrosion control treatment ("OCCT") recently implemented by DCWASA and the Washington Aqueduct. The elements of the monitoring and supplemental monitoring program were described in EPA's letter dated August 3, 2004 designating application of the corrosion inhibitor orthophosphate as the OCCT for the District of Columbia drinking water distribution system. Based on comments received from the Washington Aqueduct and DCWASA, EPA is making minor modifications as described herein. For convenience, the elements of the monitoring and reporting program are summarized in the enclosure.

In its August 3, 2004 letter, EPA stated that the OCCT designation was considered an "interim" designation because it applied only to the passivation period. EPA stated that it expected to designate a final OCCT for maintenance of corrosion control once the system is passivated. EPA also identified WQPs and provided instructions to the Washington Aqueduct and DCWASA regarding monitoring and reporting of WQPs. In addition, EPA instructed DCWASA to develop and submit to EPA for review a supplemental water quality monitoring plan identifying at least twenty-five (25) additional or "supplemental" tap sample locations for monitoring WQPs in addition to those required by 40 C.F.R. § 141.87. The additional or "supplemental" sample locations were to be representative of dead-end and low flow areas of the distribution system confirmed using DCWASA's calibrated hydraulic model. By letter dated August 20, 2004, in response to a letter from Mr. Jacobus, EPA modified the pH WQP applicable to the Washington Aqueduct and clarified the monitoring period for purposes of compliance.

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Please note that the monitoring and reporting requirements set forth in EPA's August 3, 2004 letter and DCWASA's proposals have been provided to the Independent Peer Review Panel assembled by EPA's Office of Ground Water and Drinking Water in Washington, D.C. EPA expects that the review by the Independent Peer Review Panel and consideration of their comments and recommendations will take several weeks. After due consideration by the principals, EPA will make appropriate adjustments to WQP monitoring and reporting. In addition, EPA will consider opportunities to reduce the monitoring and reporting requirements as additional data is gathered, provided that the data demonstrates that the distribution system is responding to the orthophosphates as expected. We will also review such opportunities at the end of the passivation period.

In its August 20, 2004 letter, DCWASA comments that the list of water systems served by the Washington Aqueduct on page 3 of EPA's August 3, 2004 letter is incomplete. EPA is unaware of any other water system, consecutive to either DCWASA or the Washington Aqueduct, that should be regulated under the Safe Drinking Water Act. If DCWASA has information that would indicate other, consecutive water systems exist that should be regulated, please forward that information to EPA.

DCWASA's August 20, 2004 letter states that the purpose of the WQP monitoring and reporting required by EPA's August 3, 2004 letter is to "evaluat[e] the long-term effect of OCCT with respect to reducing lead at the tap." This statement does not completely capture the purpose of the WQP monitoring and reporting requirements, including the supplemental monitoring program. The interim OCCT designated by EPA's August 3, 2004 letter is limited to the passivation period. The purpose of the monitoring and reporting required by the August 3, 2004 letter is to facilitate evaluation of water chemistry changes taking place within the distribution system during passivation of the system. Changes in the WQPs identified as "report and monitor" will provide important information regarding changes in water chemistry and will allow EPA, the Washington Aqueduct, DCWASA, and external reviewers to identify treatment adjustments. EPA believes it has sufficient authority pursuant to the Lead and Copper Rule, 40 C.F.R. §§ 141.80-.91, and other authorities under the Safe Drinking Water Act, 40 U.S.C. §§ 300f, *et seq.*, to direct the monitoring and reporting described herein.

Because the introduction of orthophosphate has commenced, DCWASA immediately must begin monitoring and reporting WQPs in accordance with EPA's August 3, 2004 letter and this letter. Pending receipt of the Independent Peer Review Panel's views, EPA is not prepared at this time to accept DCWASA's proposal to conduct supplemental sampling at fire hydrants in lieu of tap samples. Testing at hydrants in lieu of tap samples is not supported by the literature, industry guidance or by experts consulted by EPA. Sources and experts consulted by EPA indicate that sampling at the hydrants does not provide a good representation of conditions within the system, particularly due to the volume of water flushed, scouring and disturbance likely to occur in the course of taking the samples. Nevertheless, we will ask the Independent Peer Review Panel to review DCWASA's proposal to conduct supplemental sampling at fire hydrants.

EPA agrees with DCWASA that more frequent sampling at fewer sites may provide better information during the initial introduction of the corrosion inhibitor. Accordingly,

pending any revisions to the monitoring and reporting requirements arising from the Independent Peer Review Panel's review, DCWASA may choose to monitor for all WQPs, including total coliform, at: (1) twenty-five supplemental sites at the tap once per month per EPA's August 3, 2004 letter; *or* (2) no less than fifteen supplemental sites at the tap twice per month. Under either option, all parameters shall be monitored and the supplemental sample sites shall be at taps located in dead end or low flow portions of the distribution system. The purpose of the supplemental monitoring is to determine if negative effects of the orthophosphate are occurring as well as to determine if an orthophosphate residual is reaching the low flow, dead end areas. It is these low flow areas where red water or increased bacteria are most likely to occur. For example, if orthophosphate residual is not detected in these areas in tap water samples, this would be valuable information for the Washington Aqueduct in adjusting orthophosphate dosage.

EPA agrees that it is inappropriate to collect coliform bacteria samples from hydrants. It is appropriate, however, to collect coliform bacteria samples from taps in low flow and dead end areas. Orthophosphate adds phosphorus to the distribution system. This may accelerate bacteria growth. Along with heterotrophic plate count bacteria, coliform bacteria samples are extremely important to determine if the orthophosphate is spurring additional growth of biofilm organisms. Coliform bacteria can be a part of biofilm populations in distribution systems. Further, DCWASA's distribution system is biologically active. EPA is requiring coliform bacteria monitoring because the history and condition of the DCWASA distribution system increase the possibility that coliform bacteria levels could increase with the addition of orthophosphate. It is recognized that total coliform bacteria are indicator bacteria and an increase in total coliform bacteria caused by the application of orthophosphate does not mean that there is a human health risk. To assure there is no risk to human health, DCWASA is directed to provide EPA by September 22, 2004 with a plan for responding to positive total coliform and fecal or *E. coli* samples. With respect to the relationship of the samples for WQPs taken at the supplemental sampling locations and DCWASA's compliance with the total coliform rule, DCWASA's attention is directed to 40 C.F.R. § 141.21(a)(6).

EPA notes that the supplemental water quality monitoring plan provided by DCWASA does not address QA/QC and in that regard is incomplete. DCWASA should implement immediately a revised supplemental water quality monitoring plan that addresses sample collection procedures, transit to laboratory, holding times prior to analyses, training of sample collectors, a protocol for routine (such as every tenth sample) split sample laboratory analyses for parameters sampled using uncertified field methods. A copy of DCWASA's revised supplemental water quality monitoring plan should be submitted to EPA for review by September 22, 2004.

EPA is currently working with the Washington Aqueduct to assess the Aqueduct's chloramination process and the levels of free ammonia leaving the treatment plants. This information will be used to assess the need to alter the free ammonia water quality parameter designated for DCWASA. EPA may also use this information to designate a free ammonia water quality parameter for the Dalecarlia and McMillan treatment plants. Until this review is completed, EPA recommends that DCWASA and the Washington Aqueduct work closely to ensure the current free ammonia water quality parameter designated for DCWASA is met. EPA

also recommends that DCWASA and the Washington Aqueduct coordinate closely on pH management so that both entitities meet their assigned pH WQPs.

Finally, EPA welcomes DCWASA's commitment to continuing its rigorous monitoring for lead levels in the distribution system. To that end, EPA is amending its WQPs to direct DCWASA to continue performing lead profile analyses at a minimum of four homes that DCWASA profiled before April 2004 prior to the Washington Aqueduct's annual switch to chlorine. One home should be profiled each month, and each home should be profiled at a frequency of no less every four months. The continued profiling of these homes, along with the good benchmark data generated at these sites earlier this year, may provide the most direct evidence of changes in lead levels in tap water, as well as information on the effects of orthophosphate on lead service lines and other brass or lead solder components in homes.

A summary of the WQPs monitoring and reporting requirements associated with the application of the corrosion inhibitor orthophosphate as the OCCT for the District of Columbia drinking water distribution system is enclosed. Please note that, in addition to the revisions noted above, the enclosure deletes the duplicative parameters for free ammonia and total phosphorus and clarifies that all WQPs for the supplemental sampling locations are "monitor and report" only. Thank you for your efforts to help secure a long term solution to elevated lead levels in the District of Columbia drinking water distribution system. If you or your staff require additional information, please contact Rick Rogers, Water Protection Division, EPA Region III at (215) 814-5711.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division
EPA Region III

Encl

cc: Hugh J. Eggborn, Director, Office of Water Programs, Culpepper Field Office, Virginia Department of Health,
Robert J. Etris, Director of Public Utilities, City of Falls Church, Virginia
Randolph W. Bartlett, Arlington County Department of Public Works
William J. Brown, Ronald Reagan National Airport
Thomas Calhoun, District of Columbia Department of Health
Thomas Lewis, Naval District Washington

## ENCLOSURE

**Water Quality Parameter Monitoring and Reporting for Optimal Corrosion Control Treatment Designated August 3, 2004 as modified August 20, 2004 and September 7, 2004**

**Washington Aqueduct**

*Water Quality Parameters for the Passivation Period*

*For water entering the distribution system during passivation period:*

| | InterimWQPs | WQP Goals |
|---|---|---|
| pH: | 7.7 ± 0.3 | 7.7 ± 0.1 |
| Orthophosphate | 1.0-5.0 mg/l* | 3.0 mg/l* |

*dose necessary to reach this residual in tap samples

Monitoring shall be conducted according to the requirements in 40 C.F.R. § 141.87.

WQP reports shall be submitted to EPA within ten (10) days of the end of each monthly monitoring period

**DCWASA**

*For tap water sample locations from the distribution system selected pursuant to 40 C.F.R. § 141.87 during passivation period. All parameters shall be monitored monthly at twenty-five sample locations:*

| | Interim WQPs | WQP Goals |
|---|---|---|
| pH | 7.7 ± 0.3 | 7.7 ± 0.1 |
| Orthophosphate residual | 1.0-5.0 mg/l | 3.0 mg/l |
| free ammonia nitrogen | 0.5 mg/l | 0.2 mg/l |
| nitrate/nitrite nitrogen | 0.5 mg/l | ≤ 0.1 mg/l |
| free chlorine | monitor & report | |
| total chlorine | monitor & report | |
| temperature (°C) | monitor & report | |
| alkalinity | monitor & report | |
| Calcium hardness as CaCO3 | monitor & report | |
| Calcium dissolved hardness | monitor & report | |
| iron | monitor & report | |
| aluminum | monitor & report | |
| total dissolved solids | monitor & report | |

| | |
|---|---|
| oxidation-reduction potential | monitor & report |
| sulfate | monitor & report |
| color | monitor & report |
| heterotrophic plate count bacteria | monitor & report |
| total coliform bacteria | monitor & report |
| fecal coliform or E. coli testing of total coliform positive samples | monitor & report |
| total ammonia nitrogen | monitor & report |
| dissolved PO4 | monitor & report |

*For supplemental tap water sample locations from the low flow and dead end areas within the distribution system during passivation period. All parameters shall be monitored either: (1) monthly at twenty-five sample locations; or (2) every two weeks at no less than fifteen sample locations:*

| | |
|---|---|
| pH | monitor & report |
| Orthophosphate residual | monitor & report |
| free ammonia nitrogen | monitor & report |
| nitrate/nitrite nitrogen | monitor & report |
| free chlorine | monitor & report |
| total chlorine | monitor & report |
| temperature (°C) | monitor & report |
| alkalinity | monitor & report |
| Calcium hardness as CaCO3 | monitor & report |
| Calcium dissolved hardness | monitor & report |
| iron | monitor & report |
| aluminum | monitor & report |
| total dissolved solids | monitor & report |
| oxidation-reduction potential | monitor & report |
| sulfate | monitor & report |
| color | monitor & report |
| heterotrophic plate count bacteria | monitor & report |
| total coliform bacteria | monitor & report |
| fecal coliform or E. coli testing of total coliform positive samples | monitor & report |
| total ammonia nitrogen | monitor & report |
| dissolved PO4 | monitor & report |

All parameters shall be monitored monthly at twenty-five sample locations selected pursuant to 40 C.F.R. § 141.87. Compliance with the numeric WQPs shall be assessed based upon monitoring conducted at the locations selected pursuant to 40 C.F.R. § 141.87.

In addition, all parameters shall be monitored either: (1) monthly at twenty-five (25)

supplemental tap sample locations representative of dead-end and low flow areas of the distribution system confirmed using DCWASA's calibrated hydraulic model; or (2) every two weeks at no less than fifteen (15) supplemental tap sample locations representative of dead-end and low flow areas of the distribution system confirmed using DCWASA's calibrated hydraulic model. There are no numeric WQPs associated with the supplemental tap sample locations. Compliance will be determined based on whether the samples are taken and reported timely.

The foregoing monitoring shall be implemented immediately. No later than September 22, 2004, DCWASA shall submit to EPA for review its plan for responding to positive total coliform and fecal or *E. coli* samples to assure that there is no risk to human health, and its revised supplemental water quality monitoring plan addressesing QA/QC.

DCWASA shall continue performing lead profile analyses at a minimum of four homes that DCWASA profiled before April 2004 prior to the Washington Aqueduct's annual switch to chlorine. One home shall be profiled each month, and each home shall be profiled at a frequency of no less every four months.

WQP reports shall be submitted to EPA within ten (10) days of the end of each monthly monitoring period.