Technical Expert Working Group Conference Call
Special Meeting

Monday June 30, 2008
1:30 p.m. – 2:30 p.m.

DRAFT CALL SUMMARY

Attendees:

EPA and contractors: Rick Rogers, Jennie Saxe, Jeff Kempic, Mike Schock, and Laura Dufresne

The Washington Aqueduct: Tom Jacobus, Miranda Brown, Patty Gamby, Woody Peterson, Bob Powers, and Mel Tesema

DCWASA and contractors: Charlie Kiely and John Civardi

George Washington University: Marina Moses

Falls Church City: Bob Etris

Arlington County: Dave Hundelt

DC Department of the Environment: Collin Burrell, William Slade, and Monir Chowdhury

Summary of Discussions

Tom Jacobus summarized issues associated with the supply of phosphoric acid. He stated that there is an international problem with pricing and availability of phosphoric acid and that the Aqueduct has had to settle for a 90 day contract at a very high price. The new contract pricing is approximately $5,000 per ton as compared to the previous cost of $1,000 per ton. This increase will cost WA and its customers about $0.5 million for the 90-day period and up to $2 million if the price stays that high for an entire year. Tom stressed that the Aqueduct does not foresee having to reduce the dose because of product availability, but that the pricing change provides is a good opportunity to discuss the long-term maintenance dose level.

Mike Schock added that during the recent AWWA ACE conference in Atlanta, GA, he heard other water utilities discussing problems with availability and cost of phosphoric acid. Within the U.S., utilities on the East Coast appear to be having the most problems. Utilities in the U.K. have also been hard hit and are looking at possible long-term solutions including phosphorus recovery from wastewater sludge. AwwaRF and AWWA are considering an emergency project to develop both short- and long-term projections for phosphoric acid to help utility managers plan for this market change.

With respect to an appropriate maintenance dose, Mike Schock reported that EPA ORD is always doing research and being asked what constitutes an appropriate maintenance dose for orthophosphate. In the U.K., all water utilities use phosphate for corrosion control, with finished water concentrations ranging from about 2.7 to more than 6.0 mg/L as PO_4. Many U.K. systems have lead pipes, which is relevant to the DC situation. Many U.S. utilities use much lower doses, but most do not have lead service lines. Moreover, Mike reported that many utilities are targeting the LCR action level of 15 ppb rather than optimizing treatment, which can lead to misinterpretation as to what is an appropriate maintenance dose.

Jennie Saxe provided highlights from Rich Giani's June 26, 2008 e-mail to the TEWG (included as attachment A). DCWASA's 90th percentile lead levels are continuing to decrease, with the most recent round of sampling at approximately 7 ppb, the lowest level yet since the start of the orthophosphate treatment. These date indicate that the DCWASA system is not yet fully passivated and that they are still moving towards a maintenance dose. Rich noted in his e-mail that phosphate is having a beneficial impact on controlling iron corrosion and coliform growth in the distribution system. Mike Schock added that his previous analysis of lead pipe scale showed that the majority is still lead-IV compounds with a very thin lead-phosphate layer on the scale surface.

Charlie Kiely reported that DCWASA needs scientific evidence to support reducing the phosphate dose at this time. At minimum, he recommends 6-months of pipe loop studies in addition to scale analysis by EPA ORD. Tom Jacobus said that the Aqueduct pipe loops could be used for some of this research, and that they could contract with Vern Snoeyink to help analyze the results.

Bob Etris stated that because Falls Church does not have a lead corrosion problem, they are neutral on the issue of the appropriate maintenance dose. They are not happy about the cost, but support DCWASA's recommendation to conduct pipe loop studies before lowering the current dose. Dave Hundelt noted that the only problem Arlington had had with the phosphate treatment was the appearance of a white substance in the water, but this has been resolved. He agreed with Bob Etris that even though Arlington does not have the lead corrosion issue, they support DCWASA's recommended approach to conduct pipe loop studies first before reducing the dose.

The results of additional pipe loop research by DCWASA and the Aqueduct would tie in well with the publication of some very relevant AwwaRF research projects, including the following:

- Project number 3018, Contribution of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues, scheduled for publication in November 2008

- Project number 3107, Effect of Changing Disinfectants on Distribution System Lead and Copper Release, scheduled for publication in February 2009

As next steps, DCWASA will harvest lead pipe from the distribution system and send it to Mike Schock for scale analysis. DCWASA and the Aqueduct will work together to identify possible pipe loop studies. The group agreed to discuss this issue again during its next quarterly TEWG call scheduled for the end August.

Attachment A: June 26, 2008 e-mail from Rich Giani, DCWASA, to the TEWG with response to Jennie Saxe's e-mail.

"Maureen and I can not be on the call on Monday, so I'm sharing my thoughts on e-mail.

Earlier today the WQ groups from each utility met to have a technical discussion relating to the reduction of orthophosphate.

Tomorrow WASA will be submitting the LCR report to EPA and I'm excited to say that our 90th percentile levels are at their lowest with first draw samples coming in at 7 ppb. Second draw samples were also low with a 90th percentile level of 10 ppb. To me, this is an indication that phosphate has not completely optimized as it continues to slowly work its way deeper into the lead service line scales.

Mike Schock recently revisited the effects of phosphate related to lead solubility and had felt comfortable that phosphate works well in the range of 7 – 8 and that higher dosages reduce lead solubility (i.e. 3 mg/L is better than 1 mg/L). (Mike, please correct me if I misstated you).

WASA recently completed collecting data from a year long AWWARF study focusing on lead scale release due to water quality changes. One of the pipe loops contained a lead oxide scale that was exposed to orthophosphate for two years. During the project, low phosphate (01. – 0.2 mg/L) water from the Washington Aqueduct was injected into that pipeloop on a weekly basis. Within 2 days, the phosphate levels in the pipeloop stabilized to approximately 1.0 mg/L. This phenomenon occurred every week throughout the entire project which would indicate that the phosphate scale was equilibrating causing it to be released into the water at a slow rate. Lead release was more sensitive at this dosage compared to pipes exposed to 2.5 mg/L of phosphate but still had some impact in keeping the lead levels low. At the end of the study, the remaining question was, how long would the phosphate continue to release into the water and when will it stop having an impact on keeping lead on the pipe.

Being that lead oxide solubility has not been explored too much, I think we need to ask the question; "what is a good maintenance dose"? Our current dosage may be that good dosage. Then we need to ask the question, "what happens if we accidently go below the maintenance dosage"? After seeing the phosphate release in the study, it may be that phosphate will start being released from the scales and we may or may not pick it up in our monitoring. At times, we do see dissolved phosphate concentrations in distribution samples up to 2.9 mg/L. Maureen and I ask ourselves, how can the dissolved dosage be higher than what's coming from the treatment plan? Is it spikes coming from the treatment plant? Is it coming from the scale or accumulated precipitated inorganic phosphate (aluminum phosphate, etc.) redissolving?

The point is we don't know and my feeling is that as we change phosphate dosages, it may take a couple of years to restabilize the lead scales.

Iron scales are also impacted by phosphate. Minimizing iron release in old cast iron mains not only reduces discolored water, but it also reduces the amount of biofilm release from microbes attached to the scale. I must admit I am completely amazed how our coliform levels have dropped dramatically since the introduction of orthophosphate. So this brings up the question as to what a good maintenance dose is related to iron and microbial release.

With that said, I am very much in agreement that we should ensure that chemical treatment is optimized and that we are adding just the right amount of chemical that satisfies EPA regulations, ensures public health and addresses our customer's concerns.

I think everybody agrees that we are not going to have a reflex reaction to this situation and quickly reduce the phosphate levels to what we assume is a "maintenance dosage".

I think we all agreed today that we need to conduct some sound research before we make any kind of changes, which based on the information I mentioned, may take time to come up with answers. Perhaps making a few recirculation loops similar to the ones at Ft Reno or using one of WASA's existing loops, cut the dosage down to 2.0 mg/L in the loop and monitor the lead release for six months. If lead levels remain the same, then drop the dosage in the distribution system. Continue to monitor the pipeloop for at least another year or two (I honestly think it's going to take that long before we are sure we will not see any negative impacts). If we went below our maintenance dose and we were getting interference from phosphate release back into the water, at least the pipe loop has a six month head start and will most likely start to see issues way before we see it in the distribution system, which will give us a chance to react hopefully in time.

So in summary, I vote no change while lead levels continue to decrease in the distribution system; in the meantime study a drop in phosphate to 2.0 mg/L for at least six months and if good, continue the pipeloop monitoring and drop the dosage to 2.0 mg/L in the distribution system when we feel our lead scales have stabilized and hold for two years before thinking about reducing further."