

**Rawls, Bruce**

**From:** Jim.Correll@CH2M.com  
**Sent:** Friday, September 17, 2004 10:35 AM  
**To:** darnold@spokanecity.org; Rawls, Bruce  
**Cc:** lhendron@spokanecity.org; John.Spencer2@CH2M.com; Marlena.Guhlke@CH2M.com  
**Subject:** Advanced Wastewater Treatment Technology Evaluation Workshop TM  
**Attachments:** Advanced Wastewater Treatment Technology Evaluation Workshop

Bruce & Dale -

The tech memo review comments below were provided by Kathy Cupps of Ecology. As you can see they are devoted to further clarification of the potential performance of some of the treatment technologies that were considered. Notably, Kathy did not dispute the conclusion that it is inappropriate to set maximum instantaneous phosphorous discharge limits. I've forwarded her comments on to Glen Daigger for his guidance on how best to address them in the tech memo. As soon as I've gotten Glen's input I will finalize the document. If it is acceptable to you, the TM could be distributed as follows:

- City and County prepare transmittal letters to Dave Peeler at Ecology. We could prepare mock-up if desired.
- Either the City or County mails the two letters with the final document to Ecology.
- CH2M HILL distributes copies of the TMs to all of the participants and the UAA Sponsors.
- CH2M HILL distributes copies of the TMs to other stakeholders such as the Sierra Club and the Lands Council

Please let me know if this approach is OK or, if not, how would you like to proceed.

Thanx,

Jim

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-----Original Message-----

**From:** Cupps, Katharine [mailto:KCUP461@ECY.WA.GOV]  
**Sent:** Thursday, September 16, 2004 10:02 AM  
**To:** Correll, Jim/SPK; Anderson, Jerry (ECY)  
**Cc:** 'Stensel, David'; 'Larry A. Esvelt (Esvelt, Larry)'; Bramble, Lenox  
**Subject:** RE: Advanced Wastewater Treatment Technology Evaluation Workshop

Jim - Thank you for sending us the tech memo from the recent workshop on treatment technology in Spokane. Jerry and I discussed the memo this AM and agree that it appears to adequately cover the scope of the meeting. We have three comments (questions).

3/6/2008

1. On the dual sand filter technology - In the most recent (fourth) edition of Metcalf and Eddy (Chapter 6, page 508, Phosphorus Removal with Effluent Filtration) the text states the following:

"A two-stage filtration process has proven to be very effective for the removal of phosphorus. Based on the performance data from full-scale installations, phosphorus levels equal to or less than 0.02 mg/L have been achieved in the filtered effluent. To achieve such low levels of phosphorus removal, the backwash water from the second filter which contains small particles and residual coagulant is recycled to the first filter to improve floc formation within the first-stage filter and the influent to waste ratio. "

Based on the textbook summary, this technology probably deserves more attention than we gave it at the recent workshop. I believe that Dr. Esvelt intended to follow-up with Dr. Tchobanoglous on this topic - has that occurred?

2. Post Lime Filtration. My notes indicate that post lime filtration could achieve the low levels required. In a book that Dr. Daigger referenced, I believe written by Dr. Stensel, the text stated that the solubility of phosphorus could be reduced to as low as 0.003 mg/L with exacting pH control. It is just a really messy way to do it and care must be taken to keep from cementing the filter. Did I miss something important in the conversation?
3. Comments on the microfiltration membrane (MBR) state: "Some question exists regarding how far the MBR process can be pushed without damaging its effectiveness for biological treatment. Future equipment replacement may pose difficulties." Would you be more specific than 'pushed' - i.e., hydraulic loading rate, chemical addition or other.

Thank you for the opportunity to comment.

a new message from:

Katharine C. Cupps, P.E.

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Reclaiming is the process: Usable WATER is the result.

Ecology protects our air, land and water for a better Washington.