

From: [Linda Brookins](#)
To: [James Weddell](#)
Cc: [Marlo Berg](#); [Ada Lichaa](#); [Joel Klumpp](#)
Subject: FW: Reply to Question 8.k.ii. from Fourth Set of TCEQ Questions
Date: Wednesday, July 24, 2013 12:11:11 PM
Attachments: [Crypto Action Level in Finished Water AWWA 1995.PDF](#)

Red,

I noticed you were not copied on the email. I also understand Marlo is out sick today. So, here you go.

From: Daniel Nix [mailto:daniel.nix@wichitafallstx.gov]
Sent: Wednesday, July 24, 2013 11:41 AM
To: Joel Klumpp; Marlo Berg; Linda Brookins
Cc: Russell Schreiber; Kerry D. Maroney
Subject: Reply to Question 8.k.ii. from Fourth Set of TCEQ Questions

Joel,

I am currently working on the replies to the fourth set of TCEQ questions and have a concern regarding the question 8.k.ii., as it relates to the triggering of a shutdown of the DPR based on the concentration of Giardia and/or Cryptosporidium in the water entering the Distribution system.

The question revolves around triggering a shutdown if the water entering the Distribution has the following concentrations:

Giardia 7.000×10^{-6} cysts/L

Cryptosporidium 2.999×10^{-5} oocysts/L

I understand that these are the levels that have been calculated to meet a 10^{-4} de minimis annual risk of infection.

However, I reference your AWWA Journal Article (Stig Regli, et. al. November 1991), which states in the summary on page 83, that:

"Inordinately large numbers of high volume samples (generally a total volume of $>10^5$ - 10^6 L) are required to ascertain whether a potable water is below the 10^{-4} risk level. Thus, finished water monitoring is only practical to determine whether a very high level of risk exists, not whether a supply is reasonably safe."

I interpret this to say, "If you want that resolution of analysis, you will need to filter the equivalent of 26,420 - 264,200 gallons of water, and that is not practical to require." One of the problems that this presents, other than the obvious extremely high volumes, is that there is a maximum filtration rate for sample collection of 1 gpm. At this rate, to collect this volume of water would take 18 days to 183 days, respectively.

I have been researching how we might be able to accomplish some sort of "practical" water sampling at the entry point to the Distribution system. I have found an AWWA Journal article from 1995, from Charles Haas & Joan Rose, which I have attached to this e-mail for your consideration. In the article they recommend, based on evaluation of previous outbreaks of Cryptosporidium, an "Action Level" of 10 - 30 oocysts/100 L (0.1 - 0.3 oocysts / L) in the finished water. I believe that this level is well within the range of detection of the existing methods of analysis.

We would need to be able to make the same type of adjustment for Giardia.

Please review this e-mail and the attached article. We will be ready to discuss at our Conference Call on 7/25/13.

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Those who have the privilege to know have the duty to act. ~Albert Einstein