

**Upper Mississippi River Basin Association
Water Quality Task Force – UMR Water Suppliers Joint Meeting**

**September 18, 2012
Moline, Illinois**

Meeting Summary

Participants

Gregg Good	Illinois Environmental Protection Agency
Matt Short	Illinois Environmental Protection Agency
John Olson	Iowa Department of Natural Resources
Mohsen Dkhili	Missouri Department of Natural Resources
John Ford	Missouri Department of Natural Resources
John Sullivan	Wisconsin Department of Natural Resources
Jeff Mitchell	Des Moines Water Works
Leath “Chip” Drake	City of East Moline
Brent Early	Iowa American Water – Davenport
Bob Bohannon	City of Moline
Greg Swanson	City of Moline
Dave Hokanson	Upper Mississippi River Basin Association

Welcome and Introductions

The meeting began at 10:00 a.m. John Olson (Water Quality Task Force Chair) and Greg Swanson (City of Moline) welcomed the participants. Introductions of all in attendance followed.

Tour of City of Moline Drinking Water Facilities

The group participated in a tour of the City of Moline drinking water facilities, led by Swanson. This tour followed Moline’s water treatment process from intake at the Mississippi River to final treated water distribution to customers. Following the tour, all participants returned to the meeting room for discussion.

Water Quality Task Force-Water Suppliers Discussion

Presentation: Drinking Water Quality Considerations for the UMR

Swanson began the discussion with a brief presentation describing major water quality considerations for UMR water supplies generally and Moline in particular. Main points highlighted by Swanson in this presentation included:

- The multiple-barrier approach to drinking water protection which utilizes source water protection, physical removal, disinfection & inactivation, and monitoring & system integrity to provide safe drinking water to consumers.
- The significant variations that occur in UMR water quality parameter values (e.g., turbidity, TOC, ammonia, nitrate, *E. coli*, pH, and temperature) and the impacts this has on drinking water treatment processes.

- The relatively common presence of pathogens (e.g., giardia, cryptosporidium) and pathogen indicators (e.g., *E. coli*) in raw water from the UMR which requires that utilities effectively conduct disinfection and inactivate pathogens.
- The importance of balancing effective disinfection to reduce acute health risks with minimizing disinfection byproduct (DPB) formation to reduce chronic health risks.
- The contribution of total organic carbon (TOC) to disinfection byproduct formation and the impact of TOC on other water treatment steps and biological regrowth in distribution systems, as well as the complexity of TOC dynamics in the river system.
- Water treatment problems posed by algae, including: taste and odor issues, compromised clarification and filtration, increased demand for treatment chemicals, increased energy consumption, decreased operational efficiency, and increased TOC and DBP concentrations.
- The impact of turbidity on water treatment process, including the need to reduce turbidity in order to effectively control cryptosporidium.
- The presence of some emerging contaminants in UMR source water and the differing trends in concentrations among these contaminants.

Discussion

Olson asked whether microcystin is a concern for UMR water suppliers. Swanson replied that this is an emerging concern for water suppliers, but it has not yet come up for consideration directly within the Safe Drinking Water Act construct (e.g., US EPA has not placed it on the unregulated contaminants list for further evaluation).

Gregg Good asked whether Moline typically monitors for phosphorus, as this was not among the parameters discussed by Swanson in his presentation. Swanson replied that Moline does not monitor for phosphorus. Jeff Mitchell said Des Moines does do some phosphorus monitoring, but this is for general information regarding the presence of nutrients and does not affect plant operations.

Olson asked whether the level of ammonia present in raw water has an impact on treatment operations. Swanson and Chip Drake replied that ammonia levels definitely affect plant operations. Overall, Swanson said UMR utilities expect to have some challenges with nutrients, but that any reductions in nutrient concentrations are beneficial to treatment processes.

Mohsen Dkhili asked Swanson to explain the terms used when discussing pathogen inactivation. Swanson replied that this is typically done with a logarithmic scale, where 1 log indicates that 90% of the pathogens have been inactivated and 2 log means that 99% have been inactivated.

Good asked whether the UMR utilities are open to sharing the data they collect, particularly raw water data. Swanson replied that Moline is open to data sharing, but noted that past efforts to enter their data into STORET had encountered a number of challenges. Drake said East Moline monitors raw water parameters similar to those displayed by Swanson, but that in some cases the monitoring of certain parameters can be sporadic.

Short asked what entity or entities the utilities use for their laboratory analysis. Drake replied that East Moline uses the University of Iowa's State Hygienic Laboratory when they send samples out for analysis.

Swanson suggested that the UMR water suppliers could provide the WQTF with a list of what they monitor and at what frequency. Both Drake and Brent Early said their utilities have years of data available. Early added that Davenport also conducts continuous turbidity monitoring.

Good asked whether it is true that “dirty” water with higher suspended solids can be easier to treat because it allows for better flocculation. Swanson replied that in general this is true.

Bob Bohannon said the City of Moline continues to work with Mid-American Energy to operate a continuous monitoring station on the UMR in the Quad Cities area. He said the parameters currently being monitored include turbidity, conductivity, temperature, pH, dissolved oxygen, nitrate, TOC, and dissolved organic carbon (DOC) and that this data is generated via a YSI multi-parameter sonde and an S-can spectrometer. Bohannon explained that the planned biological monitoring component (i.e., sensors attached to mussels) is currently not in place at this monitoring station. He said Moline is moving forward in providing internet-based data sharing and is working with a private company (Fondreist Environmental) to serve data from this monitoring station.

John Sullivan asked how much maintenance time is needed to keep this station running. Bohannon said the YSI device is calibrated every two weeks and that the S-can sensor does not need regular calibration. He continued by saying that the station has helped Moline in picking up water quality changes moving along the river and that this has been beneficial for treatment operations. Bohannon said the station provides an additional, important source of information to the utility in understanding water quality changes happening on the river. Sullivan asked how often the utility collects a turbidity reading at its intake. Swanson said this occurs every four hours.

Bohannon noted that Moline will be adding a UV disinfection step to its treatment process and that UV absorbance is correlated with TOC concentrations. As such, he explained UV absorbance data may be another valuable data set, as these readings will be conducted continuously, rather than monitored once per day as is currently done.

Early noted that an important role of long term source water data sets is that they assist utilities in projecting capital improvement needs. For example, he explained that if a consistent increase in UMR hardness values is observed, then a utility can plan to make appropriate adjustments in treatment and infrastructure.

Mitchell said Des Moines monitors raw water quality parameters similar to those displayed earlier by Swanson, and that the utility is open to sharing its data and has put its water quality data online. Sullivan asked whether Des Moines is currently using its nitrate removal plant. Mitchell replied that Des Moines is currently utilizing a combination of other approaches (e.g., infiltration galleries, use of ponds to collect lower-nitrate water) to reduce nitrate levels and as a result the nitrate removal plant is not currently being utilized. He also noted that Des Moines has switched to sodium hypochlorite (rather than chlorine gas) for use in disinfection and that a lot of algae have been present in Des Moines’ raw water over the course of the last year.

Good asked whether Des Moines does any monitoring for the presence of microcystin. Mitchell replied that microcystin monitoring is done periodically, noting that nitrate remains the utility’s primary water quality concern.

Early said it is important for the WQTF to understand that much of the monitoring utilities do, especially raw water monitoring, is not done directly for regulatory compliance, but it does inform how the utilities operate to stay in compliance. Good asked what the physical point of compliance is for Safe Drinking Water Act purposes. Swanson replied that, for the majority of contaminants the point of compliance is the “point of entry” following treatment, but that some regulations do apply to raw water and in the finished water distribution system.

Drake commented that his source water turbidity is affected by the operation of the nearby lock and dam (Lock and Dam 14), as the adjustment of gates can cause an increase in turbidity and that he has been struggling to communicate with the Corps of Engineers on this issue.

Swanson said one issue on his mind is the impact of nutrients on the river system as a whole, and particularly the impacts of TOC and ammonia. Drake said his concern is that TOC and organic materials seem to be increasing. Swanson said the changes Moline has observed in UV transparency seem to be indicative of trends in the UMR's water quality.

Drake said each UMR utility will encounter different challenges depending on where they draw water from, but that common problems confronting UMR utilities are those associated with TOC and nutrients. Olson asked whether adding TOC to the states' CWA monitoring for the river would be beneficial to the utilities and, if so, what a recommended monitoring frequency might be. Swanson replied that TOC data would definitely be of aid to the UMR utilities.

Closing and Next Steps

In closing, Swanson said he appreciates the complexity the state CWA programs are facing in addressing water quality on the UMR. Olson thanked Swanson and the water suppliers for the opportunity to engage in this conversation.

Dave Hokanson said one prominent theme he had heard in the discussion was data sharing, and that would follow up with Swanson on potential paths to pursue in this area.

The joint meeting concluded at 12:15 p.m.