

Water Quality Technical Advisory Committee

119 E Olin Avenue

April 13, 2010 - 1:00 p.m.

Attending: Janet Battista (JB), Ken Bradbury (KB), Joe DeMorett (JD), Joseph Grande (JG), Jocelyn Hemming (JH), Al Larson (AL), Sharon Long (SL)

Absent: Tom Heikkinen (TH)

Agenda:

- **Unit Well 15 Wellhead Protection Plan Summary Update (JG)**
- **Sentinel Well Update (JD)**
- **Unit Well 8 Disinfection Study (JG)**
- **Unit Well 9 Wellhead Protection Plan (JG)**

1. Unit Well 15 Wellhead Protection Plan Summary Update (JG)

Summary Update:

- Recommendation to do monthly testing if PCE > 4 ppb. If multiple samples are collected during a monitoring period (quarter), the DNR does not average the results to determine the value for the period but rather takes the maximum value.
- Suggestion to investigate potential contaminant sources although identifying the source may be time-consuming and costly without providing beneficial information. Could easily spend many times more on research than the cost to treat.
- There is the potential that the MCL for PCE and TCE may be lowered within the next year. The PQL is 1/10 of what it was 20 years ago. The EPA is currently evaluating whether lowering the MCL to 0.5, 1.0, or 2.5 ppb (for PCE) would provide a meaningful opportunity to improve public health protection.
- If need to treat the well, fairly easy and cost efficient treatment options exist that would be capable of achieving the lower standard.
- JD received an updated geophysical log from Madeline. Concerns surfaced regarding potential fractures, in the Tunnel City formation, that could be pulling contaminants from much further away than previously thought.
- An interesting research project would involve installing a monitoring well above and below the shale layer. If the contamination is from a shallow source, which is likely, a deeper casing could help protect the deep aquifer.

2. Sentinel Well Update (JG)

Summary: Well has been sampled on 5 separate days. Conductivity, chloride, nitrate, and nitrite were measured at six ports. Ports 1, 2, and 3 are located above and ports 4, 5 and 6 are below the Eau Claire shale layer. Under *in situ* conditions, water from the lower ports should be similar to groundwater at UW 29. Results for port 6 show all 4 parameters approaching levels consistent with those observed at UW 29. Chloride level at port 6 has decreased by 50%. The well has had a fair amount of purging. Handout – summarized test results from 11/20/2009 through 3/18/2010.

Suggestion was made to sample all six ports for a broad suite of inorganic and volatile organic compounds (VOC). Previously, Madeline had recommended waiting to sample. Concern that VOC observed in an adjacent observation well were drawn into the well/deep aquifer during installation of the sentinel well and the results would not be representative of *in situ* conditions. After evaluating the pros and cons of waiting to sample, group consensus was to sample broad range of parameters following purging the well in mid-April. This sampling will be coordinated with the VOC sampling at UW29. The consensus was that there is no downside risk to sampling

now; if VOC detected now, a downward trend would be expected as the conditions around the sentinel well returned to *in situ* conditions.

3. Unit Well 8 Disinfection Study (JG)

Summary: Study evaluating iron bacteria effect on iron and manganese levels at UW8 performed by Andy Jacque. Well was aggressively chlorinated and surged with the intent to reduce elevated iron and manganese levels. Initial results showed reduction for the first few minutes and then the levels returned to baseline and remain at this level while well is online. No further reduction was noted. Iron 0.6 mg/L, Manganese 46-50 ug/L. Handout – Summary of Findings, dated 4/5/2010.

Recommendations from the study:

- #1 – Maintain a 10 ppm chlorine residual in borehole while well is off-line (Sept – May).
- #2 - Add a check valve in the pipe connecting the well discharge to the reservoir.
- #3 - Collect oxygen isotope data to determine potential impact from the lake

Recommendation #1: Chlorinate the borehole. After the well was heavily chlorinated as part of the treatment, elevated DBP levels were observed. Chlorine could corrode the pump or casing, lead to metals release along with other undesirable effects. Question was raised as to whether the DNR would even allow the practice of maintaining a residual in the well. Discussion on using peroxide rather than chlorine; potential for peroxide to make slimy scum that could cause clogs along with other unwanted side reactions. Currently, no plan to repeat aggressive chlorination prior to starting the well in 2010. Standard practice is to run the water to waste until the water is clear. In 2009, after 42 million gallons were pumped; levels of iron and manganese remained around 0.6 mg/L iron and 50 ug/L manganese. Other wells near the lakes (19, 17, 24 and 7) also have higher levels of iron and manganese but so do others that are not near a lake (28 and 30). There was no support among the committee for adopting recommendation #1 that would maintain a chlorine level in the well while the unit was off-line. *Something else is likely causing the higher levels of iron and manganese at UW 8.*

Recommendation #2: Add a check valve. Chlorine is injected at the wellhead and is already in the pipe between the well and the reservoir. Potential for 4 ppm of chlorine already exists in the pipe. Space limitations make adding a check valve very challenging if not impossible.

Recommendation #3: Collect isotope data. Samples are fairly easy to gather and to interpret. Would help determine the relative contribution of lake water to the well. Cost per sample is approximately \$40. Recommend doing a time series sample including sampling the lake.

4. Unit Well 9 Wellhead Protection Plan (JG)

This item will be the primary agenda item for the May meeting.

Next meeting: Tuesday, May 11 at 1PM.