



City of Madison
Meeting Minutes - Final
BOARD OF WATER
COMMISSIONERS

City of Madison
Madison, WI 53703
www.cityofmadison.com

Tuesday, December 20, 2005

4:35 PM

119 E. Olin Avenue

CALL TO ORDER

ROLL CALL

Present: Ald. Lauren Cnare, Priscilla B. Mather, Jonathan H. Standridge and Gregory W. Harrington

Excused: Larry L. Studesville

PUBLIC COMMENT

APPROVAL OF MINUTES

1. Approval of Minutes from the meeting of November 15, 2005.

The minutes of the November 15 meeting were approved unanimously.

INFORMATIONAL REPORTING

Due to time constraints, it was decided to move the following reports to the January 2006 meeting: Water Quality, Staffing, Operations and Customer Service.

2. November 2005 Water Quality Report.
3. December Staffing Report.
4. Operations Report.
5. Engineering Report.

Al Larson said that Unit Well 30 construction continues. Unidirectional flushing of the Nakoma/Allied Drive area was finished the week of 11/7/05, and we are waiting for some sample results from the flushing. More unidirectional flushing will be done in the Arbor Hills and other areas in the north end of pressure zone 7 when the weather breaks in the spring.

6. Customer Service/Billing Report.

FINANCE

7. Fund Balance Report.

Robin Piper said the balances are as they should be. He said the Depreciation Fund has a large balance due to the sale of the Vondron Road property. The Cash Flow Fund shows a negative because we have borrowed from the City.

8. Capital Project Report.

Robin stated that in October we spent almost \$1,352,000 but there is nothing unusual to report on that.

9. Income Statement.

Robin said we showed a loss on September 30. The Revenue includes the October 1 bills that went out and they were the first bills that showed the ½% increase.

10. Approval of Transfer of Funds from Depreciation Fund to Construction Fund.

Robin said this is needed to pay for construction projects, that we are just paying it back into the Construction Fund.

Greg Harrington made a motion to approve the transfer. Lauren Cnare seconded; unanimously passed.

11. Report of status of Rate Case.

Robin said he received a signed order today from the Public Service Commission saying we did get a 7% rate increase. This will go into effect as soon as we notify the PSC. He said it looks like the first billing it will be on will be the March 1, 2006 bills. The increase will prorate in over the next six months.

Jon Standridge made a motion to approve the informational reports. Greg Harrington seconded; unanimously passed.

ADMINISTRATION

12. General Manager's Report.

Dave said there have been a couple of media items with one being the rate increase and another on the damage done by our malfunctioning sprinkler system. There was also an article in the paper saying that Wisconsin had the second worst water quality in the country. Dave said his guess is the fact that Wisconsin has the second most number of public water system in the country. Al said it seems to be agricultural driven because of California and Wisconsin being named as the top two.

Dave said, regarding Well 10, that the Mayor has appointed a team to monitor the Well 10 manganese situation. He said Al and Doug DeMaster are on the committee, as is Larry Nelson, Jeanne Hoffman from the Mayor's Office, two people from the Health Department and some people from the neighborhood. Dave said he understands that they will track what is happening with manganese and make sure the neighborhood is informed.

OLD BUSINESS

NEW BUSINESS

13. Proposal to adopt Operating Rules for the Board of Water Commissioners on an Annual Basis.

This item was moved to the January 2006 meeting. Dave mentioned that it would not be possible to get the agenda to the board president as early as requested because Wendy works on the agenda on Tuesday and Wednesday of the week before the meeting.

14. [02510](#) Authorizing the Mayor and the City Clerk to execute a Professional Services Agreement with Clark Dietz Inc for the preparation of drawings and specifications and construction administration for the 6.0 million gallon Felland Road Reservoir located in east Madison. AD No. 3

Sponsors: Common Council By Request and Lauren Cnare

A motion was made by Harrington, seconded by Standridge, to RECOMMEND TO COUNCIL TO ADOPT - REPORT OF OFFICER AI said Clark Dietz Inc was selected as the most qualified for this job. He said their proposal was \$117,000, which was right in the middle range of the five proposals received.

Greg Harrington made a motion to approve the resolution. Jon Standridge seconded; unanimously passed.

The motion passed by acclamation.

RECOMMEND TO COUNCIL TO ADOPT - REPORT OF OFFICER AI said Clark Dietz Inc was selected as the most qualified for this job. He said their proposal was \$117,000, which was right in the middle range of the five proposals received.

Greg Harrington made a motion to approve the resolution. Jon Standridge seconded; unanimously passed.

15. Acceptance of Infrastructure Management Plan Report.

AI stated that the report has been finalized.

Jon Standridge made a motion to approve the report. Greg Harrington seconded; unanimously passed.

CORRESPONDENCE AND SPECIAL INTEREST ITEMS

16. Presentation by Abigail Cantor on Manganese Study.

Abigail Cantor said the general question was, what is the nature of the manganese occurring in the distribution system, and are some parts more susceptible to high levels of manganese and how pervasive is the problem. Abigail said she was given the task of capturing this information for the distribution system. The project dealt with old piping and films and debris that can vary over time and location. This interacts with the adjacent water flow in rather chaotic and random fashion. There are many other factors that relate to the system hydraulics, the water chemistry and piping configuration that can influence the concentration of metals in the water samples. Abigail said she listed as many factors as she could that may influence the concentration of manganese at a residence. Then she sorted through the factors, some of which she could control. Other factors she could vary in a controlled manner by her site selection, and then other factors she had no control over at all. With that approach, she developed a sampling protocol. Abigail said the samplers can only inspect and sample about 10 sites per month, so she never gets enough data points to really have a rigorous statistical analysis of what she is looking at. This is why she calls this a snapshot of what is happening in the distribution system.

Abigail said we can control some influencing factors, and we control as many as we can. Some factors we can't control but make observations about them at each site, and quantify them and later use that information to correlate it with our sampling results. This gives us a first glimpse of what the system may be like. We also get an estimate of the variability of our sampling results, which sometimes can result in designing a more rigorous experiment later on. We can compare previous knowledge from technical literature and from past project experiences. All of this helps to develop hypothesis about the nature of an unknown system and that guides us into further study. In summary, a snapshot study is our only way to take the first step into the unknown and using the knowledge gained, we can then organize future approaches to the problem.

The four goals of the project are: To develop an analytical technique, to develop a sampling technique, to describe the nature of manganese occurrence in the distribution system, and then develop plans for future monitoring. The conclusions can be read in the report. The report is on the website as well as a summary of the report are on the Utility's website and are available at the City Library.

Abigail said, at the planning meeting, Water Utility staff announced their plans to buy a spectrophotometer so they could analyze water samples for manganese and iron and perform other simple analysis. This would allow them to analyze more samples than if they sent them out to a commercial lab. Knowing that, Abigail said she worked standard laboratory quality control methods into the protocols of the investigation. A protocol was developed for comparing different sampling techniques at the site. One finding was that it is best to use the exterior hose bib of a residence vs an interior faucet. There is a higher possibility of getting a higher manganese concentration this way, as we are trying to get the worse case scenario at the site. In the report, there is a simplified protocol for continued monitoring.

Regarding manganese in the distribution system, some hypothesis was developed based on the investigation's data. One point that was made in the report was that the high manganese concentration comes from manganese in particulate form. This particulate matter appears to accumulate in the distribution

system. When the water stagnates in the pipes, you get higher manganese concentrations, so consumers need to flush the stagnating water before taking water for drinking or cooking. Manganese in the presence of chlorine slowly oxidizes from the dissolved form into a solid form of particulate matter than can precipitate in the pipe.

Abigail said the study lays out the manner in which future monitoring should be performed. The Utility is taking a number of actions in the system to eliminate particulates from the distribution system by different modes of operation of Well 10 and also with unidirectional flushing. They need to get feedback whenever they take some type of action to get some assurance that what they've done has had a positive effect. As more data is obtained, more knowledge is obtained about the nature of the system.

A recent newspaper article stated that the results of this investigation did not match results found in the field. Abigail said she doesn't know what results were being referred to, but she wants to address it. This study was done in the field, and maybe it was being compared to flushing data and there would not be a correlation. Flushing intentionally introduces a high velocity of water moving through a pipe with the purpose of dislodging debris and particulate matter and remove it from the system. Sampling this water will result in high manganese levels. This study was to try to find the worst-case scenario at a residence under normal water usage and hydraulic conditions.

Abigail said she would make a poor analogy--it would be as if you were comparing organic matter in the rainwater in your birdbath in your back yard, to organic matter in water that is coming off the side of your house during a power washing procedure. The two situations have nothing to do with each other, so I'm saying that flushing conditions have nothing to do with the conditions we're setting up for standard sampling a residential site.

During the fall, she was given some interim reports from the Utility from the flushing process. They were doing unidirectional flushing in the distribution system, and following that up with monitoring and analysis of those water samples, using the techniques we've learned in this investigation. First, flushing water coming from the hydrant was tested and it was found the manganese level appeared to be higher with smaller diameter pipe. They also sampled it adjacent to the flushing area and found there were low levels of manganese after flushing, in the area. Utility staff will continue to take action in the distribution system and they will continue to track their efforts using the techniques developed in this report.

To summarize, Abigail said this investigation shows that manganese concentrations experienced at residences in the system are most likely the result of manganese laden particulate matter that has built up in the piping system. This investigation lays the foundation for consistent sampling and analytical techniques with proper quality control. This is all done in an effort to track and quantify the effects of techniques used to remove particulates from the system. Brady Williamson, a resident of the area affected by this, asked Abigail if her assignment has been completed and the cost. Abigail replied that her study is completed at a cost of about \$10,000. Mr. Williamson asked if she reached any conclusions about water quality. Abigail said only in terms of the manganese concentration, saying that the manganese problem is a particulate problem. He

asked if she reached any conclusion about the impact of manganese concentration on our health. Abigail said that is out of her area of expertise. He asked if she reached any conclusion about the desirability of the well being reopened. She said that was out of the scope of the project. He asked if she reached any conclusion regarding bacteria from this well. She said there was no correlation with manganese levels and heterotrophic plate count (an analysis which has to do with a relative idea of the presence of aerobic bacteria). She said we did see a correlation between HPC and chlorine levels, which does make sense. Mr. Williamson asked if they measured bacteria levels themselves, and did she find them within the normal range. Abigail said she likes to use a method with heterotrophic plate count that gives a higher number than other methods used. Whenever this plate count was over 500, colony forming units per millimeter, staff went back and did a total coliform test to make sure there were no bacteria in the water that could cause a health problem. He asked if she reached a conclusion as to why there are high levels of manganese from this well. She said manganese oxidizes and precipitates as a solid. He asked if she reached a conclusion as to why manganese levels were higher at this well. She said she doesn't know that they are higher than other wells as they didn't study other wells. She said one could conclude that where there is manganese, it eventually oxidizes and builds up in the piping system. Mr. Williamson asked if the data Abigail compiled provided a basis for the Water Utility to decide next spring to not reopen the well. Abigail said she believes this is debris, a particulate problem in the piping system and if they are able to ream the particulate matter out of the piping system, there should be no problem in operating the well. He asked how they would do that. She said they are doing it with unidirectional flushing and they are tracking their results by sampling residences after that. Mr. Williamson asked Abigail if she made a conclusion based on this study, and she said no, that wasn't part of this study.

Art and Norma Hove have lived across from UW 10 for 30 years. He asked Abigail if the water he is getting from the tap is corrupted. He asked if there is any further effort to determine what is coming out of the tap. She said what she was trying to achieve in setting up this sampling protocol was to find the highest manganese concentration at a site, the worst case, so we did compare interior faucets to exterior hose bibs, both with stagnating water and with flowing water. We found that the higher levels would be at the hose bib following stagnation. Abigail said the study she did should not be confused with what is important for health purposes. She said concentrations are lower when coming out of the interior faucet. This investigation sets up the means by which they can collect data so they can add to that to get a better picture.

17. Presentation by Judy Moran, Grad Student, on her study of water quality in the distribution system.

Greg Harrington introduced Judy Moran, who just completed her Masters at UW. She got her undergraduate degree in Chemical Engineering at the University of Notre Dame and then came to UW Madison. She has had experience working for the Chicago Water Utility. The University here has a cooperative agreement with the Madison Water Utility to conduct drinking water research. Judy's objectives were to evaluate biological growth at two unit wells (26 and 28) and at two distribution system locations; to further develop biostability plots at unit wells, distribution system locations and in a model distribution system; and to determine the effects of HPC levels, chlorine residuals, and water have on biofilm formation.

Judy's biostability plots conclusions were: higher chlorine residuals are required at Well 26 than at Well 28 to maintain a target HPC level; biostability results from the wells were shown to apply at their respective distribution system locations; and chlorine significantly impacts biofilm growth. Her recommendation was to continue biostability plot analysis at all unit wells and to maintain a minimum chlorine residual of 0.1 mg/l at all points in the system.

The model distribution system summary conclusions were: higher chlorine residuals resulted in lower HPC growth; chlorine residuals had a greater impact on HPC growth than water age; and providing a chlorine residual greater than 0.1 mg Cl₂/L resulted in HPC two orders of magnitude less.

Judy stated that four of the pipe coupons from the distribution system were very similar to the results from the pipe loop system. She recommends that pipe coupons should continue to be analyzed to provide a better understanding of HPC growth in the distribution system.

18. Report on building sprinkler system malfunction/water damage.

Al said the attic sprinkler pipe was full of water, and it was supposed to be dry. The temperature dropped and it froze. The temperature went up a little bit, it thawed out and then the sprinkler system went off. He said right now we are working at getting some clean up and repair costs together. Al said he has met several times with the City's insurance adjusters. He said clean up should be around \$30,000 and restoration will be more than that. He thinks we probably won't be fully restored until February. Al said the Fire Department requires us to have a sprinkler system in the attic. In order to do that, we have to have a dry system to keep it from freezing. Al said we think that the pipe was filled for testing in March or April and never drained. Priscilla asked if there would be a financial impact on the Water Utility. Al replied that according to the insurance adjuster, the insurance would pay for this. Dave said the City's insurance would go against the contractor and subcontractor.

APPROVAL OF NEXT MEETING DATE

19. Approval of next meeting date of January 17, 2006.

Dave mentioned that he would not be present for the January meeting.

ADJOURNMENT

Jon Standridge made a motion to adjourn the meeting. Greg Harrington seconded; unanimously passed.
The meeting adjourned at 6:12 p.m.