

Dennis Water District

Board of Water Commissioners

Edward A. Crowell, *Chairman*
Paul F. Prue
Charles F. Crowell

Main-Line News

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Appointed by Water Commissioners

David Larkowski, *Superintendent*
Sheryl A. McMahon, *Clerk & Treasurer*
James Ritchie, *Asst. Superintendent*

Feasibility Study for Iron and Manganese Removal Completed

In July of 2006, the District contracted with the consulting engineering firm of Earth Tech, Inc. to conduct a Feasibility study to evaluate the concentrations of iron and manganese present in the District's water supply, the problems it causes and possible solutions for removing these minerals. Earth Tech, Inc. has had a long-term relationship with the District and has provided engineering services on a myriad of water infrastructure projects for many years.

FEASIBILITY STUDY—The scope of work undertaken by the Feasibility Study involved the compilation and analysis of historical water quality data for the District's wells, reviewing the effectiveness of the flushing program currently utilized to mitigate the iron and manganese accumulation in the distribution system, reviewing customer complaint logs and plotting water quality trends out over time with an eye to looking at what future water quality concerns might be if "no action" remedial action is taken. These questions, as well as other findings, were presented to the Board of Water Commissioners in December 2006. The primary conclusion of the report found that many of our wells produce water that has iron and/or manganese at concentrations which are consistently above the established secondary level. Concentrations at or above the "secondary" level are known to cause color, taste and odor problems as well as the staining of laundry and plumbing fixtures.

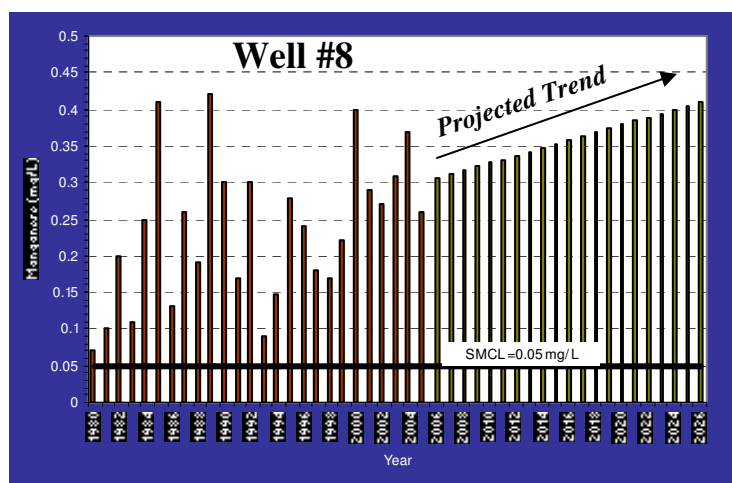
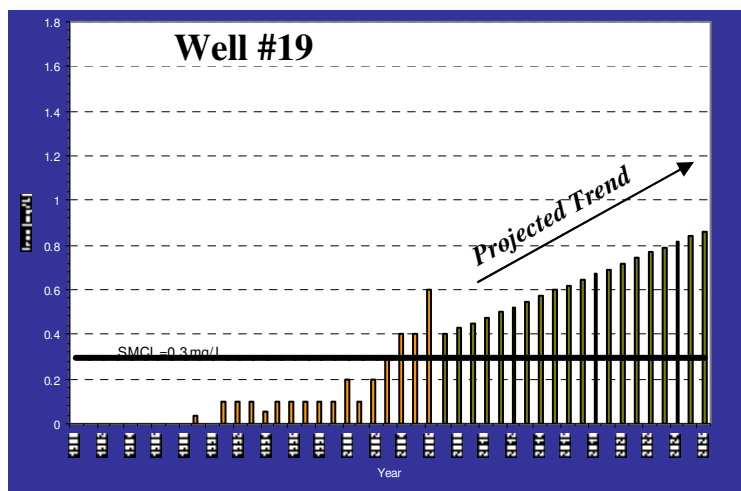
The first step was to establish the historical levels of twenty years ago and then to plot current levels in order

to determine how they have changed over time and how they may project into the future. The charts at the bottom of the page show typical results of the data that was tracked and projected into the future. Analysis of the historical data demonstrates that levels of iron and manganese from some wells have been increasing over time. In fact, some of the wells that were far below the minimum standard when they went on-line, now have levels that are causing problems and the predicted trend indicates that the condition will only worsen.

IMPACT OF REGULATIONS—The next step reviewed how the implementation of existing water quality regulations may have adversely affected the water quality in the distribution system. Meeting the requirements of the Lead and Copper Rule by raising the pH caused the dissolved iron and manganese to precipitate out of solution and cause color problems. Customers soon began complaining about smelly water and rust-colored stains on their laundry. A flushing program was initiated to remove the buildup of iron from the water mains. This was followed by a number of incidences involving high bacteria counts. It then became necessary to chlorinate periodically. Adding chlorine to the system oxidizes the dissolved minerals which in turn exacerbates the color, taste and odor problems.

New regulations, such as the Ground Water Rule, which is expected to be released in the near future, may require more disinfection of the water supply.

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TANK IN NEED OF MAKEOVER

The Route 134 water storage tank, also known as the *Six-million gallon tank* is in need of exterior paint. This extensive painting project has been anticipated for three years and as such, the voters have supported appropriations of \$200,000 and \$300,000 in FY 2005 and 2006 respectively.

An additional \$150,000 appropriation will be requested at the April 2007 Annual District meeting to meet the \$650,000 cost of the project. The scope of the work includes removing all of the exterior paint and underlying primer coats by sand blasting and re-paint with a new gray exterior color.

The tank was last cleaned and repainted on the interior in 1999. In 2001, the outside was pressure washed to remove mold in an effort to prolong the life of the exterior paint.

Bids for the work are to be advertised in late spring once all of the funding is approved for work to commence in the fall of 2007. Due to high water demands of the spring and summer seasons and the cold weather in winter, there is only a small window of opportunity in the fall when the tank can be emptied and the weather is conducive to painting.



*Six-Million Gallon Storage Tank
Route 134, South Dennis*

Don't Forget!

Annual District Elections—April 23

**Annual District Meeting —April 24
7:00 PM at the Dennis Senior Center
Route 134, S Dennis**



The Board of Water Commissioners invites the public to attend an informational session on Iron and Manganese Removal at the Dennis Senior Center on April 12 at 6:30 PM.

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This will likely increase the occurrence and duration of the problems associated with high iron and manganese levels. These problems cannot be eliminated without the physical removal of the underlying minerals. The Feasibility Study recommends removing these minerals from the water from at least 10 of the District's existing 22 production wells.

DESIGN AND COST—Evaluating different treatment technologies and design options is an essential step in proposing a system that is efficient and affordable in terms of initial construction, operations and maintenance. The two technologies under consideration are Green Sand Filtration and Membrane Filtration. The mid-range on the cost of constructing two plants is \$15,000,000. As with any major public works project, costs will only continue to increase when the project is postponed.

The Board of Water Commissioners, has voted to recommend an appropriation of \$400,000 at the Annual District Meeting for the design phase of the project. Designing the project will provide more definitive numbers for grant and loan applications as well as gaining final voter approval of the project at a subsequent meeting

BONUS BENEFIT—There is another benefit to be gained if the two treatment plants recommended are constructed. Well #17 was abandoned just after the installation of the gravel-packed well because it produced so much iron it would have caused immediate water quality problems. By having iron removal treatment available, Well #17 could be completed and added to the production inventory and add 1,000,000 gallons per day of pumping capacity.

FINANCIAL IMPACT—As the project is being contemplated and design options weighed, the District will seek grant commitments from a federally funded Rural Development program and low-interest loan commitments from the State's Drinking Water Revolving Loan Fund program. Analysis of the impact on the water rates continues and will be presented at a public hearing set for Thursday, April 12 at 6:30 PM at the Dennis Senior Center. The public meeting is an opportunity to learn about the project and ask questions in advance of the Annual District Meeting on April 24, 2007.