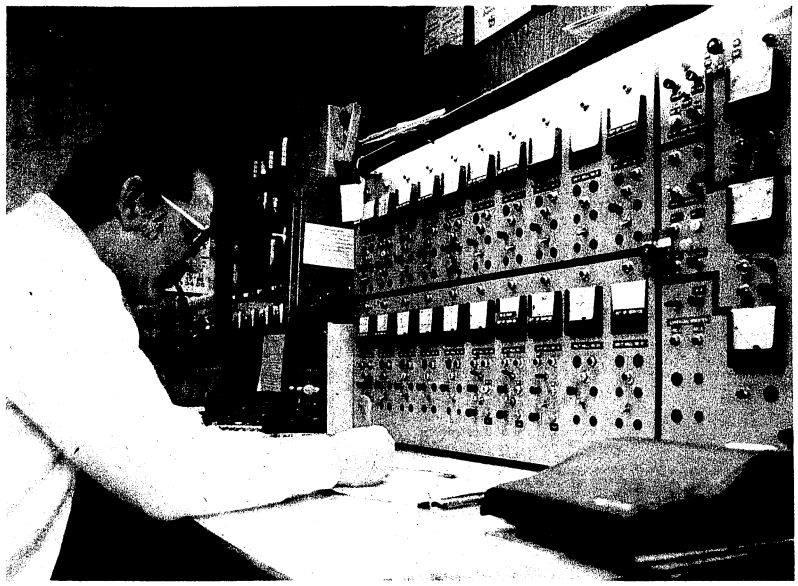
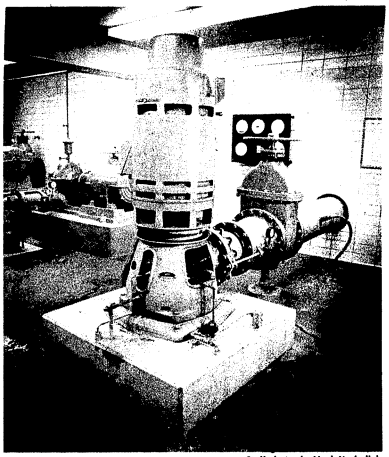
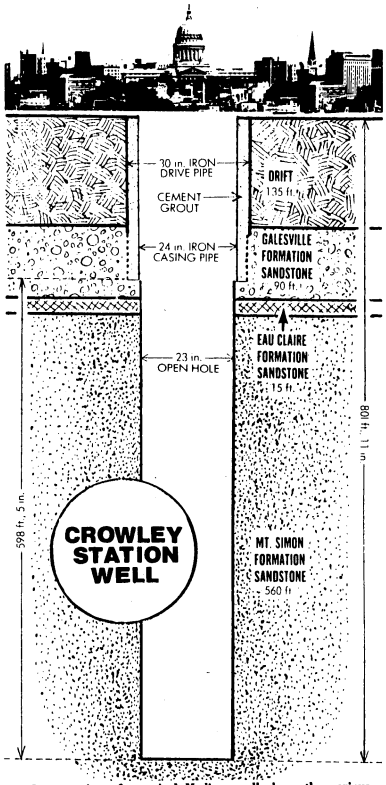




Staff photos by Hank Koshollek

Luther Cook (left), a 25-year employee of the Madison Water Utility, keeps watch over the control board in the central station on Hancock Street near Lake Mendota. All 27 city wells are monitored from the location. Above, the inside of a typical Madison well station. Water is drawn up by the main pump (center), then chlorinated (through pipe near wall) and stored in holding tanks on the other side of the wall. Booster pumps (background) draw water out of the holding tanks.



Cross section of a typical Madison well shows the various levels of sandstone that are drilled through before hitting granite bedrock, in this case at about 800 feet. Some of the city's wells go down more than 1,000 feet.

Clean lakes and rivers are 'first line of defense' of drinking water

By DAN ALLEGRETTI
Of The Capital Times Staff

Madison area residents, and for that matter Wisconsinites in general, can point to having some of the purest, cleanest drinking water in the nation.

The main reason is that Wisconsin's drinking water comes from underground, and from surface sources that originate within the state. Cities in this state do not have to worry about taking drinking water from a river or lake that may be polluted from sources upstream and beyond local control.

That which we have flushed down the toilet has not come back to haunt us — yet.

Most of Wisconsin's industrial and municipal sewage is disposed of in such a way as to not endanger water supplies in this state. Sometimes that means washing it downstream in the Wisconsin or Mississippi rivers, for cities in Illinois, Iowa and points south to worry about.

Milwaukee recently was hauled into court by the State of Illinois and ordered by a federal judge to quit discharging pollutants into Lake Michigan. Those pollutants — sewage from the City of Milwaukee — were washing southward with the lake's currents and endangering Chicago's water supply.

One might well pity residents of cities that get their drinking water from a river such as the Mississippi — especially the lower portions of that mighty stream. When those cities were first developing, that water may have been relatively clean. Now persons in Louisiana, for example, are drinking water that must be purified of sewage from half the country.

Here in Madison, though, drinking water comes from wells, some of them more than 1,000 feet deep. The water they draw up is water that, of course, at one time fell as rain. By the time it seeped way under ground it was filtered by soil and sandstone of most of the impurities it became mixed with when it first fell to the surface.

That system still works fine today, as evidenced by recent studies that show Madison's water to be free of all the worst contaminants. Still, man's effect on the environment has begun to take its toll here.

The first effect to be felt has been an increase in recent years in the amount of chlorides in the water, caused by street salting. Chlorides are one of those insidious chemicals that are not filtered out by natural means. The salt dissolves in melting snow, is washed into the ground or into lakes and streams, and eventually works its way into the underground water table.

This process can take a long time. State and municipal road crews were using salt for many years before any effect was noticed in the water supply, and even though Madison now has cut back on the amount of street salt the city uses, Madison Water Utility officials say it will be a long time before any decrease in chlorides is noted in the water supply. It may even continue to increase for some time to come.

Water from some of Madison's 27 wells already has been found to contain amounts of chlorides close to the danger level set by the American Heart Assn. for persons on salt-restricted diets.

Officials of the Madison Department of Public Health and the city water utility recently sent letters to all area physicians informing them of the salt content in drinking water **"so that this may be taken into account for those on a strict sodium diet."** The letter also pointed out the dangers to these persons of drinking artificially softened water, which contains high amounts of sodium.

But what concerns water utility officials most about the chloride contamination is what it portends. It means that in all likelihood, surface water is beginning to be drawn down into the underground water table.

This is more likely to happen today than it was a couple of decades ago, they explain, because of the incredible amounts of water that have been pumped out of the ground in recent years. The Madison Water Utility alone pumps out some 12 billion gallons a year, roughly equivalent to the amount of water in Lake Waubesa. The more water that is pumped out, the more that is naturally drawn down from the surface to take its place.

This raises potential problems in two areas: First, the surface water — coming from lakes and streams in the area, and from urban and agricultural runoff — is not a suitable additive to the drinking water supply. And second, a high rate of exchange of water from the surface to the underground table could affect the levels of lakes and streams and dry up wetlands so important to waterfowl and other animals.

The latter situation seems to be under control. Madison Water Utility is careful to space its wells far enough apart and not pump too much water out of any one well, in accordance with standards set by the U.S. Geological Survey. Also, Madison's population is leveling off and with it the amount of water that is used.

What the utility is paying particularly close attention to these days is protecting the quality of the drinking water by preventing contamination from polluted surface water — so that, in other words, we won't have to face that specter of the things we flush down the toilet coming back to haunt us.

Cleaning up surface water — area lakes and streams — is "our first line of defense" in protecting drinking water supplies, said Larry Russell, manager of the Madison Water Utility.

"If the concentrations (of pollutants) are building in the lake water they could be in the groundwater in the next 10 years or so," he said.

If that happens, he pointed out, Madison and Dane County residents will have no one to blame but themselves. Whereas years ago geologists thought underground water supplies came from long distances, they now believe that recharge is localized. In Madison's case, the vast majority of drinking water comes from rain that at one time fell in the Yahara River basin.

To avoid future problems, the water utility is concentrating its efforts in two directions, Russell said: supporting efforts such as that under way now by the Dane County Regional Planning Commission (RPC) to reduce surface water pollution; and conserving water, especially during peak summertime usage periods.

The RPC is developing a Dane County Water Quality Plan focusing on ways to reduce water pollution. It recently completed a series of public hearings on the subject, with more hearings scheduled for this spring after a tentative plan is developed.

Water conservation efforts concentrate on encouraging off-peak usage, such as watering lawns during evening hours, and on reducing daily household usage for purposes such as showers, toilets and dishwashers.

"The average home in Madison uses 300 gallons of water a day. We've got so much room to cut back," Russell said.

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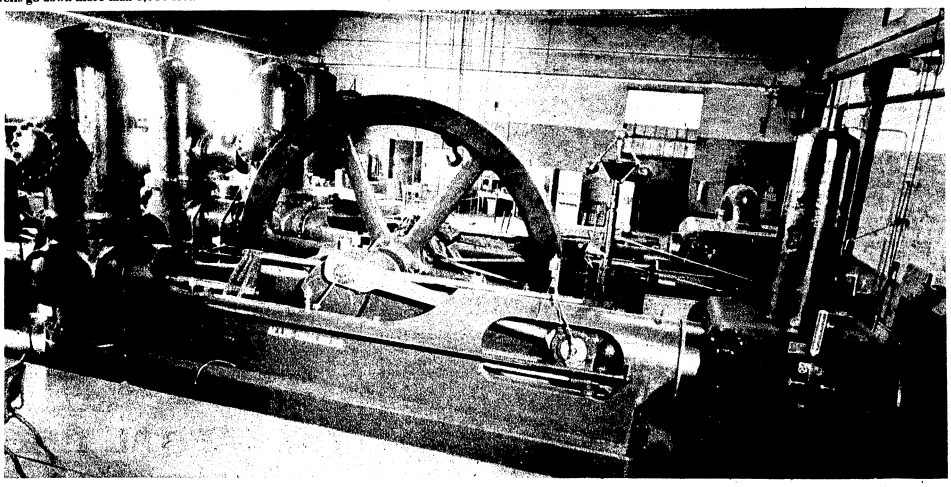

This huge old steam-driven pump, still located in the Nichols Station though no longer in use, is one of two that at one time supplied water for the entire city. The wheel in the center alone weighs 10 tons. The other steam pump now is on display at the House on the Rock; this one, when Madison Water Utility abandons the Nichols Station next year, likely will be kept where it is and turned into a local landmark.