

# TETRA VIEWS

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## City of Shelby

### New Technology Monitors Shelby's Water System

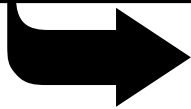
*Note: Parts of the article below appeared in the local Shelby Promoter (author Jodee Black) and are reprinted here with permission.*

#### Tetragenics Welcomes



#### New Customers

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This summer, Tetragenics installed a telemetry system for the City of Shelby in Montana. The state-of-the-art technology equipment maintains water levels and alerts City of Shelby workers to any power failures or other problems at the city's water well site near the Marias River.

The system provides pump protection and pump rotation while keeping water storage tanks full. It uses interface computer controls to monitor the depth of the water storage tanks and detect any problems or failures with the water system.

"This new equipment will eliminate the need for us to keep running back and forth to the river to see if the pumps are working," said Bill Moritz, a city foreman in charge of the water system.

"The system will automatically shut down equipment and alert the operator at Shelby's city shop if anything goes wrong at the water well site," said Chad Carpenter, Tetragenics Project Manager. "Eventually, if the city is required to report distribution figures to the state electronically, they can hook their system to a personal computer to log data and produce the necessary reports."

Government regulations are forcing municipalities to add or upgrade technology used in their water systems.

"Government regulations will make this type of system more standard. The system we installed is state-of-the-art and offers capabilities for future expansion," said Carpenter. "A water automation system can also be used in water treatment, waste water, and water distribution applications."

Although residents will not notice any difference in the water running out of their taps, Moritz said the installation of the

Shelby telemetry system means that all the water well pumps will not have to run at the same time, as they did before.

Before the new system, an operator would have to drive to the sites daily to turn them on in the morning and off in the evening. Although the number of pumps running will decrease, there will be no effect on residents' water pressure.

"This will save in energy costs," he said. "It will also keep our storage tanks full constantly. More and more government regulations are being imposed on water systems, and this system will enable use to keep up with those requirements."

All of us at Tetragenics welcome the City of Shelby. For more details on the system installed at Shelby, see the corresponding article on page 3.



Chad Carpenter, left, of Tetragenics, and Bill Moritz, a city foreman in charge of the water system, stand in front of the new computerized control panel. Photo by Cindy L. Combs

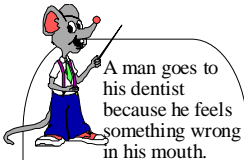
## City of Havre

### New Radio Telemetry System at City of Havre

#### Tetragenics Welcomes



#### New Customers



A man goes to his dentist because he feels something wrong in his mouth.

The dentist examines him and says, "that new upper plate I put in for you six months ago is eroding. What have you been eating?" The man replies, "all I can think of is that about four months ago my wife made some asparagus and put some stuff on it that was delicious...

Hollandaise sauce. I loved it so much I now put it on everything --- meat, toast, fish, vegetables, everything." "Well," says the dentist, "that's probably the problem.

Hollandaise sauce is made with lots of lemon juice, which is highly corrosive. It's eaten away your upper plate. I'll make you a new plate, and this time use chrome."

"Why chrome?" asks the patient. To which the dentist replies, "It's simple. Everyone knows that there's no plate like chrome for the Hollandaise!"



#### The Situation

To provide water for its customers, the City of Havre Water Treatment Plant in Montana used an outdated telemetry system — connected to a computer that was never designed to be compatible with anything else. Components were failing and replacements were not available.

The Manager of the Havre Water Plant wanted a dependable system, one they could repair with off-the-shelf parts, and it had to come from a company with a history of productive customer service. The City selected Tetragenics to provide a new radio telemetry system.

The City wanted to control three remote sites (the East Standpipe, the Cemetery Booster, and the West Standpipe) and two sludge pumps from the water treatment plant office. All the controls had to be performed through a Microsoft® Windows™ interface. The automatic system had to maintain adequate water pressure for residential and fire use.

At the East Standpipe, the system had to monitor water level, line pressure, the flow through a venturi flowmeter, and the building temperature. It had to let operators turn on and control the speed of the two pumps using existing variable speed drives.

At the Cemetery Booster, the system had to monitor tank level, flow from a magnetic flowmeter, and the building temperature. From this site the system also had to control three booster pumps.

For the West Standpipe site, the system had to relay water

level and building temperature readings to the plant.

#### The Solution

Tetragenics installed an Opto 22 system that allows the City's operators to route treated water to a network of storage tanks. As the level of water at the tank drops, the system alerts the operator and adjustments can be made at the treatment plant.

The Opto 22 equipment is especially suited for small control systems. A central controller communicates with remote racks. For Havre, each rack has up to 16 analog or digital points. One analog rack can handle different types of analog signals as any combination of inputs or outputs. Operators can define the analog and digital points individually.

Each rack can respond to local conditions even when not communicating with the central controller. Local PIDs and event reactions (alarm control) offload processing from the central controller.

At the City plant we installed a Pentium® PC containing an Opto 22 G4LC32ISA-LT controller. The controller fits into the ISA bus of the PC and communicates with remote Opto 22 racks of analog or digital inputs and outputs.

The controller communicates with the analog and digital racks at each location through a modem and radio transceiver. Tetragenics developed the control strategy and created animated graphics showing tank levels, temperatures, and pump status.

At the Master and at the well field, screens show the status of the system using animated representations of actual equipment (a tank fills on screen as the actual tank fills). Alarms appear as flashing symbols. Operators select on-screen push buttons to control the pumps. The system is user-friendly, easy to use, and provides for future expansion.

The equipment (racks, radios, modems, etc.) is mounted to panels and installed in metal enclosures. The user interface program, OptoDisplay, runs in Windows® 95 or Windows NT®, and provides a graphical interface to the process.

Following the completion of the initial system, the City added more equipment for another tank site.

We welcome the City of Havre into the circle of Tetragenics customers.

#### TETRA VIEWS

Published by the Tetragenics Company three times a year to provide useful information about products, corporate news, and industry events. Please send comments to the editor.

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# City of Shelby Water System

## - The Story -

### **The Situation**

The City of Shelby Water department needed help. Their existing control system was old and malfunctioning. The City's crew had to manually maintain the water level in their main 1.5 million gallon storage tank. Operators had to travel to the well field that supplied the main tank and turn the pumps on and off daily.

If the level transducer broke down, the main tank would overflow and they would lose water. And the Government was issuing regulations forcing municipalities to automate their systems.

The City of Shelby and Tetragenics got together and came up with a solution.

### **The Solution**

Tetragenics programmed and installed telemetry equipment to control the Shelby water system and allow operators to set and view parameters as required. (See the related article on page 1.)

### *Simplified Description*

In simplified form, the system monitors the water levels in the main storage tank and maintains a minimum level. The tank supplies residents with water. If the level changes, the system automatically adjusts the water flow coming from eight remote well house pumps.

The system is optimized so that not all the water well pumps have to run at the same time. This saves energy costs. Also, the remote sites can be controlled from the main City Shop.

### *Details*

For the project, Tetragenics installed an Opto 22 G4LC32 Controller (Master) at the Shelby City Shop. The Master includes a display and keypad for operators to set alarm points, specify set points, and view the status of various points in the system.

Radios connect the Master and the main tank to the well field. The Master reads the ana-

log level and checks the limit to determine which pump(s) to turn on or off. It continuously outputs the levels to a chart recorder.

Opto 22 B100 brain boards are installed at the well field. The Master communicates with these remote brain boards for automatic pump control. The new system interfaces with original control modules to show pump run, fail, and call conditions.

The Tetragenics system gives the City of Shelby

- better control of their water system,
- an efficient automation system,
- room for future expansion,
- lower energy costs, and
- the ability to meet government regulations.

Plus, they get these things without having to drive to the well field.

## !! NEWS !! FLASH ON MC3000

The new PC-based MC3000 Series Master can poll 240 RTUs per polling port. This means a typical system with 10 polling ports can poll 2,400 RTUs from the one Master.

You can add even more ports. Call us for details.



Who is  
... that? ...

Name the Engineers

Answers  
on page 4.



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# SPOTLIGHT



## COME SEE US

We are always available at our offices in Butte, MT. Also, we will be at the shows below. Hope to see you there.

**Montana Telephone Association (MTA): December 3-4, 1997, Billings, Montana - Clarion Hotel**



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**NAME THE ENGINEERS -  
Answers for page 3.**

**Our featured engineers are June Tangaro and Don Scott in the first picture, and Weiling Yang in the second photo. How did you do?**

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