

Differentiation Through Technology and Services

Schlumberger Water Services (SWS) provides a complete range of cost-effective water exploration, utilization and optimization solutions for public, and private sectors.

Working as an integral part of your team, or as technology providers, we offer several scalable solutions to meet your business needs.

With over two decades of environmental experience, our teams of professionals are ready to assist you in all aspects of your water and groundwater resource projects.

Applied Technologies:

- Diver-NETZ
- Mini-Diver
- Micro-Diver
- CTD-Diver*
- Cera-Diver
- Baro-Diver

Monitoring Groundwater Without Boundaries

Guelph, Ontario, Canada



The Diver-NETZ wireless network decreased data collection efforts from 160 to 16 hrs/mth

Background

The City of Guelph is quickly becoming one of the fastest growing economic regions in Canada. Combining the old and the new, ancient buildings reminiscent of the City's past mingle in harmony with Canada's premier research universities and diverse manufacturing, service, and high-tech communities. Fast-paced economic growth and a booming population of over 110,000 inhabitants who rely entirely on groundwater resources have raised the need for efficient use and management of the City's water resources.

In September 2006, Schlumberger Water Services (SWS), in cooperation with the City of Guelph's Waterworks Department, conducted a pilot study covering 19 functioning wells scattered around 12 facilities and extended over 150km² of land. Diver-NETZ, a wireless monitoring system, was introduced in the second phase of the study. Combining field instrumentation with advanced wireless and data management capabilities, the integration of Diver-NETZ resulted in a substantial increase in groundwater monitoring efficiency.

Guelph's water comes from a permeable zone within the Amabel Formation. In places, the bedrock is overlain by overburden deposits – clays, silts and sands that were deposited by glaciers. Some of these layers are aquitards where groundwater movement is extremely slow. The aquitards act as barriers to protect the deeper groundwater aquifers.

"Historically, we weren't able to collect a great deal of data because it was all done manually", recalled Kier Taylor, Compliance Coordinator. "What we are able to do with the use of dataloggers is to increase the quantity and the quality of the data – more units per unit-time over a dollar value".

Consequently, this approach became instrumental in meeting the City's legislation compliance efforts while staying within budget.

Highlights:

- Schlumberger Water Services (SWS), in cooperation with the City of Guelph's Waterworks Department, conducted a pilot study that resulted in a substantial increase in groundwater monitoring efficiency
- The Diver-NETZ network consisted of field instrumentation, wireless communication, and data management capabilities
- As a result, data collected per month was increased from 300 to 3,000 data points while the total collection cost was reduced from \$2,800 to \$75 approximately (from \$33,600 to \$900 annually)

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Case Study: Monitoring Groundwater Without Boundaries

Challenges

The City's traditional method for collecting data involved a series of manual tasks that included locating wells, opening and unlocking caps, lowering water level meters, and taking readings from each nested well. During a normal monitoring routine, technicians would spend over 160 hours collecting groundwater data from the 23 wells covered in the project.

From lock-to-lock, 300 data points obtained per month would normally cost approximately \$2,800 - or \$33,600 per year. Additional costs were also incurred on data management, hiring and training of personnel, and service vehicle maintenance.

As a result, collecting groundwater data was a significantly expensive and time-consuming operation. This in turn translated into a smaller number of readings collected per month and diminished compliance efforts.

Consequently, the City of Guelph recognized that dataloggers presented a more efficient way to mitigate labor costs. Diver-NETZ not only alleviated these costs but provided a complete set of integrated tools.



Data was wirelessly collected from a distance of 150 meters

Solution

SWS introduced the Diver-NETZ system to the City of Guelph in two phases. The first phase involved the use of Diver dataloggers (Diver-Suite), Diver Data Cables (DDC), and Diver-Pocket software. This phase of the program allowed for a substantial increase in confidence of data accuracy. In addition, the readings were collected from all wells simultaneously, providing a better snapshot of the groundwater activity within the aquifer.

The second phase included the introduction and incorporation of the wireless and in-office solutions (Diver-DXT, Diver-DXD, and Diver-Office). With a wireless connection range of up to 150 meters, technicians were able to locate and collect data from roads and pathways without having to walk directly to the wells. In turn, the 2-person, 75-hour collection excursion was reduced to a one-person, 4-hour trip.

Training on wireless data collection was also provided for technicians and assistants. A four-hour training session was implemented to educate the city workers on how to program, collect, and download information for visualizing and reporting the data.

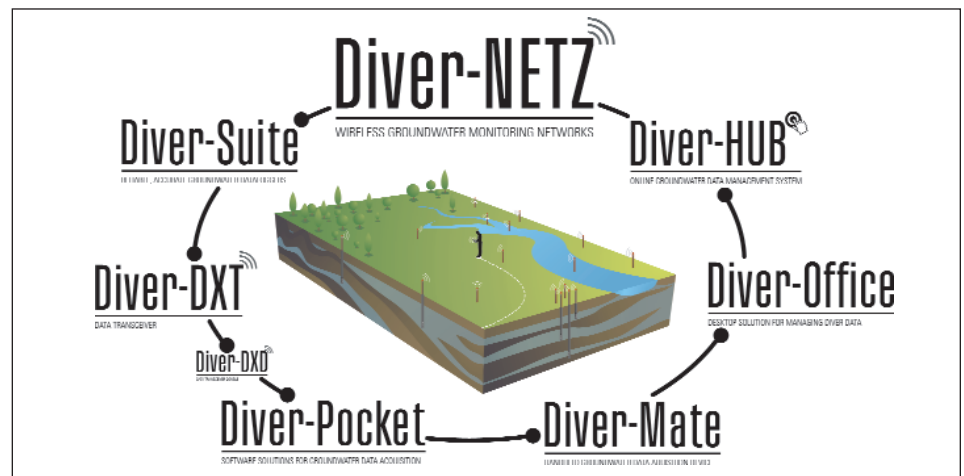
Results

Quantitative results from the implementation of Diver-NETZ are summarized as follows:

- Tenfold reduction in field time for collection of 300 data points (from 160 to 16 hours)
- Dramatic decrease in cost per data point collected (from \$9.33 to an estimated \$0.25 pdp)
- Decrease in monthly cost of data collection (from \$2,800 to \$75, annual reduction from \$33,600 to \$900)
- Increase in the amount collected data (from 300 to 3,000 data points, 750 readings)

While there was a substantial decrease in training hours and the level of expertise required for collecting data, technicians were also able to avoid site obstacles and hazards including fenced private property, steep inclines, and river crossings.

Through further analysis, SWS concluded that the Diver-NETZ system was 70% more efficient than the former collection method.



Diver-NETZ provided the City of Guelph with a wireless monitoring network that increased the quantity and quality of data collected