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## DEQ's Drinking Water Database Unveiled

### Team Works to Revamp Old DMAC System

After a two and half year effort, a team of technology experts, engineers, and scientists recently completed a project to revamp the Division of the Drinking Water's database – a monumental task that required moving 1.5 million rows of data from the old database to the new one.

The new program, called the State Drinking Water Information System (SDWIS), which contains information to help regulate public water systems, was officially unveiled on June 30, 2006.

Project Manager Bob Shipman, IT manager assigned to the Department of Environmental Quality, worked with a team consisting of: Ken Bousfield, Brett Shakespear, and Mark Jensen in the Division of Drinking Water; Tad Wimmer and Brent Pathakis in the Information Technology Office.

"We are pleased the work is completed," said Kevin Brown, director of the Division of Drinking Water. "This new system will prove to be more efficient in our day-to-day operations. The team, however, really deserves the kudos for their hard work."

Tackling the project wasn't easy but it had to be done. The 26-year-old DMAC system had become very difficult to program because of old software technology and recently adopted federal regulations.

"We knew we had a good chance of success," said IT Director Ryan Walker. "We concluded that if 30 other states were successfully using the U.S. Environmental Protection Agency's SDWIS program, it was a proven system to use."

Because of its complexity, the team was assigned a project manager. Shipman, a 25-year veteran of DEQ, was just the person. "I'd say it was one of the five biggest challenges I have had to deal with in my career."

For one thing, it wasn't a simple task of just switching out an old database with a new one. The system had to be customized to fit Utah's unique Division of Drinking Water (DDW) business practices. "It added a huge amount of complexity and anxiety," explained Shipman. "There is always the tendency to make a new application look like the old one."

SDWIS contains information about public water systems and their violations of EPA's drinking water regulations, as reported to EPA by the states. These regulations establish maximum contaminant levels, treatment techniques, and monitoring and reporting requirements to ensure that water systems provide safe water to their customers.

Shipman says it was teamwork that made for the successful transition.

"I did a lot of the project management," he said. "There's a lot of success that isn't necessarily attributable to me. The team members are the ones who did the 'real' work."

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## **School Kids to Breathe Easier with Cleaner Buses**

A program is under way to retrofit diesel-powered school buses in Davis School District with pollution control devices to make them cleaner for the children who ride them and the air quality better for the community residents around them.

This retrofit project is the result of a partnership between the Division of Air Quality (DAQ), Chevron USA, and Davis School District. As part of a consent decree, Chevron is providing \$200,000 to Davis School District. DAQ is serving as the technical adviser and plans to monitor the results.

"It's a great project," said Rick Sprott, director of the Division of Air Quality. "It will make a huge difference for the school children and bus drivers who have to stand near a bus every day and breathe diesel exhaust."

Diesel bus exhaust is considered a carcinogen and contains dangerous gases such as carbon monoxide and very fine particles that can get lodged in the lungs. Children's lungs are still developing and more sensitive to pollution. The exhaust can also trigger asthma attacks.

But removing the particulates is costly. Some devices that trap the particles can be \$8,000 or more per bus.

Davis School District hopes to retrofit as many of its fleet as possible. There are 230 buses serving Davis County schools.

"We don't know if we can do all of them but we will do as many as we can," said Craig Carter, administrator of support services for Davis School District. "We plan to use the \$200,000 for the equipment and will donate our labor. We hope to have it completed by the start of school in 2007."

The plan is to install a closed-crank filtration system that sharply reduces the emissions inside the passenger compartment of the bus and the emissions out of the tailpipe.

"It also will improve the air quality as emissions from the tailpipe will improve. Either way it will improve the air quality both inside and outside the bus," Carter said.

Joe Thomas, manager of DAQ's mobile source section, is excited about the potential of this program. He and others presented the District staff with the filtration system that proved to be less costly than most retrofits.

"Davis School District wanted to do something innovative and cost effective," said Thomas. "From a DAQ perspective, this is our first retrofit program. We need to make sure this is a good experience for the school district and others. If successful, we want to go ahead, and with the help of Davis School District, persuade other school districts to implement cost-effective retrofit projects."

DAQ also plans to monitor the progress. Thomas said they will measure the pollution before the retrofit and afterward to compile data to show the benefits of the program.

"We want to show results," Thomas said. "That's where it counts the most."

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## Small Town Leads Utah in Wastewater Technology

Besides its rural scenic beauty and famous rodeo, the city of Oakley in Summit County now has something else to boast about: The city has built the first membrane wastewater treatment plant in the state of Utah. Now, other communities are following Oakley's lead.



"We wanted to be on the cutting edge," said Doug Evans, a former mayor of Oakley who spearheaded the project in 2000.

Three years ago, Oakley replaced its aging lagoon system with a membrane bioreactor system that has gained increasing worldwide attention in the field of wastewater technology.

"For years, the state said we needed to upgrade our system so we started saving money," Evans said. "We were able to do all of this for \$1.6 million – much of it paid for by Oakley."

The Water Quality Board did provide a \$400,000 loan and \$200,000 grant to build one of the most advance wastewater treatment plants. On Aug. 9, 2002, Oakley began construction on a plant with a 250,000 gallon a day capacity that can be expanded to meet future growth. The project was completed just 15 months later.

"This is a great example of how the water loan programs can help communities," said Walt Baker, director of the Division of Water Quality (DWQ).

Paul Krauth, outreach coordinator for DWQ offered Oakley technical assistance. "This is the future of wastewater treatment," he explained. "There are four membrane bioreactor plants in Utah and six others proposed."

Compared to conventional wastewater facilities, the membrane bioreactor system is relatively low maintenance. In Oakley, Evans volunteers his time to serve as an operator when needed, sharing the duty with a half-time paid operator.

The plant is virtually odorless. Two parallel trains of anoxic and aerobic tanks make up the bioreactor. The membranes, which resemble long strands of spaghetti, are bundled together and suspended in large cassettes that are connected to collection pipes. The cassettes are immersed directly into the “mixed liquor” of the process tank and a slight vacuum draws the water into the membrane fiber and filters out impurities.

Since the system removes solids by filtration rather than settling, the process is much more effective than conventional treatments. The Oakley plant operates its bioreactor at 10,000 to 16,000 mg/l (milligrams per liter) of suspended solids compared to 3,000 mg/l for a conventional system, making the space required for the plant 20-30 percent of a conventional wastewater plant.

“What’s nice about this plant is that it does digest a lot of the solids,” Evans said. The sludge is hauled to a landfill but not as often as a conventional plant. “We only remove about 10 metric tons of solid a year.”

Another bonus: Oakley’s plant discharges water that is pure enough for reuse.

“This water is going to be used to irrigate a 60-acre park within the next two years,” Evans said. “It’s a water source. The turbidity is .5 – better than some drinking water.”

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## **Solid and Hazardous Waste Board Looks Ahead**

With Utah’s population projected to be 2.8 million in 2010 – a 9 percent increase – the Utah Solid and Hazardous Waste Control Board faces two distinct challenges: managing the increasing volume of solid and hazardous waste and overseeing cleanups that turn blighted properties into redevelopments.

The Solid and Hazardous Waste Control Board has dual oversight within the Department of Environmental Quality. It not only oversees federal and state environmental laws relating to solid and hazardous wastes managed by the Division of Solid and Hazardous Waste but also the underground storage tank program and Brownfields reclamation projects managed by the Division of Environmental Response and Remediation.

“It’s unique among the other boards within DEQ because it does cross two divisions,” said Board Chair Craig Anderson, an environmental attorney. “By statutory authority, the Board is responsible for implementing laws governing underground storage tanks, commercial hazardous and solid waste facilities, and the incineration of chemical weapons at the U.S. Army’s Deseret Chemical Depot in Tooele County.”

“The Board always is deliberative to make sure that these requests are done so that it is protective of public health and the environment,” said Dennis Downs, director of the Division of Solid and Hazardous Waste.

Brad Johnson, director of the Division of Environmental Response and Remediation, agreed. “The Board has provided valuable direction that has contributed to successes in cleaning up contaminants from underground storage tanks leaking petroleum.”

There are a variety of issues that keep Board members on their toes, noted Bill Doucette, a Board member since 1998 who works at the Utah State University’s Water Research Lab. “We consider

issues ranging from used oil and tire recycling to nerve agent disposal. These issues are important not only for the state of Utah but the region and nation as well.”

The Board also considers amendment requests to commercial licenses like EnergySolutions’ mixed waste facility. It approves all new solid and hazardous waste regulations and has oversight of all municipal landfills and non-hazardous waste facilities in the state.

Two primary challenges lie ahead, Board members say.

“I foresee an increased demand on how to deal with hazardous waste,” said Carlton Christensen, a Salt Lake City Councilmember who has served on the Solid and Hazardous Waste Control Board since 2003. “I don’t see new hazardous facilities opening up every day but there will be increased demands on current providers to take increased volumes of waste.”

Growth will also drive the demand for cleaning up contaminated land.

Christensen hopes more communities will look at opportunities to turn blighted property into economic reuse, or Brownfields, which is property that once was polluted but is now redeveloped. The Board has assisted various Utah communities in this effort.

Brownfields helped the Salt Lake City Council in 1998 reclaim portions of an old rail yard in downtown and turn it into a crown jewel commercial development known as “Gateway.”

“It can be a win-win,” Christensen said. “But it’s going to take some education of local officials to see the possibilities. It is not a simple process but a doable one and I’m hopeful we can look at some ways to work with the Legislature and staff to induce Brownfields reclamation.”