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# Utah Environmental Report



2011

Photo Courtesy of Charles Uibel

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# Utah Environmental Report: 2011

Issued December 23, 2011

State of Utah  
Utah Department of Environmental Quality  
195 North 1950 West  
Salt Lake City, Utah 84114

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## Message from the Executive Director

The Utah Department of Environmental Quality has, since 2006, taken this opportunity to highlight our environmental achievements over the past year in its annual *State of the Environment Report*. Each year the report updates the most current information on the amount of pollution released to Utah's environment, and it showcases our environmental achievements.

This report is no different in that regard. But this year—2011—marks a milestone for a number of reasons. It was 20 years ago that DEQ was officially established as an agency with the mission of “*safeguarding human health and quality of life by protecting and enhancing the environment.*” And each year since, DEQ's six Divisions have made significant progress toward protecting and enhancing Utah's Air, Land, and Water. While much progress has been made, there remain issues that need our vigilance, such as improving air quality in the Uintah Basin.

Given the importance of energy to Utah's economy and environment, energy is afforded its own section in this report. In 2011 the Utah Legislature created the Utah Office of Energy Development. Additionally, Energy is one of Governor Gary Herbert's four cornerstones of his administration policy. While the Office of Energy Development is an independent office, I proudly serve dual roles as the governor's Energy Advisor and Executive Director of DEQ.

As the statistics in this annual report indicate, Utah's environment continues to improve. Finding ways to work more efficiently and produce better results is difficult but critical to businesses and industries subject to DEQ oversight. It is also critical to enhancing the quality of Utah's environment.

Again in 2011, DEQ invited the public and stakeholders to take a critical look at how we do business. Allowing full review of our administrative process—a look at how information is gathered, analyzed, and decisions formed. This is a process of openly and honestly evaluating how we can improve upon our mission of safeguarding and enhancing Utah's environment.

And we also listened to what you had to say. In the Divisions of Air Quality and Radiation Control we've found better ways to review permits, encouraging the public to participate early and often while giving business and industry assurances that we will act in a timely manner, producing a permit that best protects public health and the environment. In the Office of Finance and the Division of Environmental Response and Remediation we are working to implement improvements that will result in increased efficiencies in our budgeting and business transactions and a more coordinated emergency response.

The *State of the Environment Report for 2011* cannot yet measure the effectiveness of our new management approach, but it is a reflection of what we've learned and how we've grown over the past two decades. Our mission remains resolute: We will safeguard human health and quality of life while protecting and enhancing Utah's environment. This annual report provides you, the public and interested stakeholders, with the data to show we are in fact doing that.



Photo by Trenton Davis



## Cleaner Air

The Division of Air Quality (DAQ) continues to be committed to improving Utah's air quality. In most cases, we've been able to meet the challenges of tougher federal standards to help Utahns breathe easier and live healthier. As noted in the previous State of Utah Environment Reports—2006, 2007, 2008, 2009, 2010—in the early 1980s, Utah struggled to meet the health standards for four of the six criteria pollutants identified by the U.S. Environmental Protection Agency (EPA). By 2006, all Utah counties had attained the then-current federal air quality standards.

In December 2006, a revision to the EPA's standard for the allowable daily average of fine particles (PM<sub>2.5</sub>) went into effect, reducing the standard from 65 micrograms per cubic meter (µg/m<sup>3</sup>) to 35 µg/m<sup>3</sup> because scientific evidence shows that exposure can be much more harmful to health than previously known.

None of 13 sites where ozone is monitored exceeded the federal limit in 2010 or 2011.

On December 14, 2009, the EPA directed the State to find ways to reduce wintertime pollution because parts of the state violate the Clean Air Act's limits for PM<sub>2.5</sub>. These "nonattainment" areas in Utah include all of Salt Lake and Davis counties, portions of Utah, Weber, Box Elder, and Tooele counties, and those portions of Cache County, Utah, and Franklin County, Idaho, in the Cache Valley. During 2011, DAQ developed the expected inventory of future emission sources after accounting for growth and on-going pollution control programs. In 2012, the inventory will be used in computer models to quantify the amount of emissions reductions needed to bring the area into attainment of the federal air quality standard. DAQ also began meeting with stakeholders to identify potential air control strategies that could be considered when the State's plan is developed.

Vehicle exhaust, industry, wood stoves, wildfires, and snow blowers, among other sources, contribute to poor air quality.

Historically, much of the Wasatch Front has had difficulty meeting the federal air quality standard for ozone, a summer-time pollutant. However, as the EPA continues to lower the standard to protect the most sensitive portion of the population, Utah continues to implement programs that help the area meet the standard. For example, the State has phased in the use of gasoline vapor controls on the delivery of gasoline to all gas stations in Utah. Utahns continue to take notice of DEQ's Choose Clean Air actions and voluntarily take measures to limit driving on summer days when the ozone air pollution is particularly

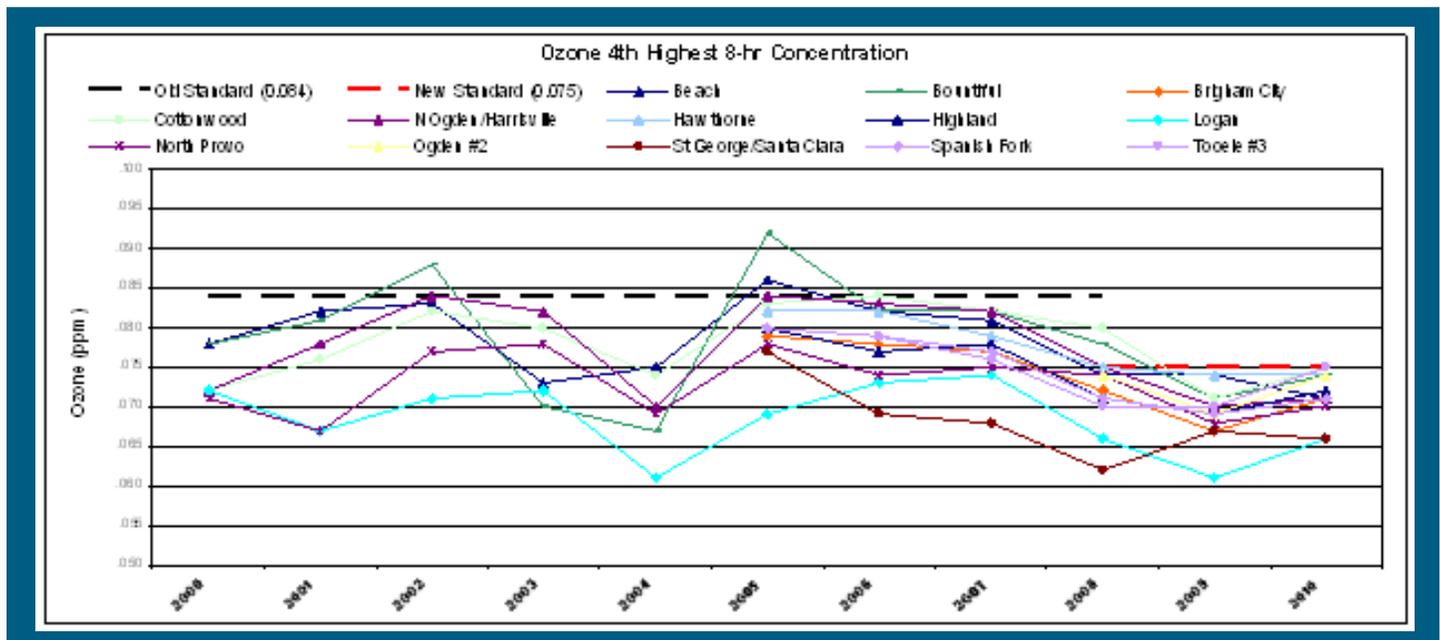
bad. We can measure that by the fact that the number of summer-time “red” air quality days continues to decline, partly due to good weather and public awareness. DAQ alerts people all year long to pollution conditions by issuing “green, yellow, and red” air alerts. None of the 13 sites where ozone is monitored exceeded the federal limit in 2010 or 2011, based on the average readings over three years.

In the Uintah Basin, ozone is a wintertime problem. As noted later in this section, DAQ is working with stakeholders to address the issue before federal regulations are imposed.

## Pollutants

### Ozone

Ozone is formed when volatile organic compounds (VOCs) and nitrogen oxides (NOx) mix with sunlight and heat. Ozone, sometimes referred to as smog, is principally a summer time problem when temperatures are high and daylight hours are long, but it may have implications to wintertime particulate problems as well. Recent evidence indicates that ozone may also be a problem under certain conditions during the winter, primarily in the Uintah Basin. All areas in Utah are currently meeting the ozone standard during the summertime, but high levels during the winter are a concern. DAQ is coordinating a massive research effort during the winter of 2011/2012 to study the formation of ozone in the Uintah Basin.



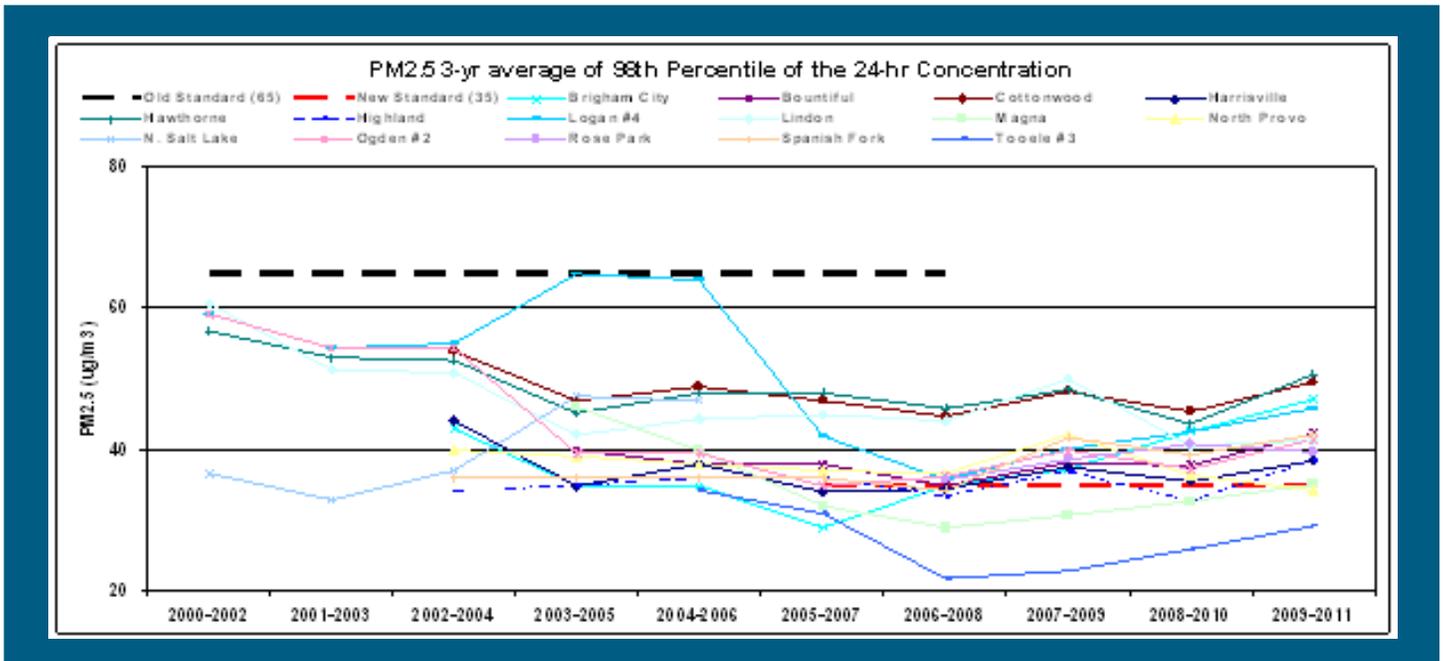
Over \$5.4 million in State and federal grants have helped 32 small business and 30 school districts purchase cleaner and more fuel efficient equipment for their operations, reducing emissions by over 25,000 tons and saving over 1.3 million gallons of diesel fuel over the life of the fleets; nearly \$5 million worth of fuel savings.

## Particulate Matter (PM<sub>2.5</sub>)

Particulate matter refers to the tiny particles found in the atmosphere that range in size from less than one tenth of a micrometer (about one-tenth the size of a human hair) up to 50 micrometers in diameter. Fine particulate matter known as PM<sub>2.5</sub>—those particles less than or equal to 2.5 micrometers in diameter—is a more serious health problem. As noted earlier, the EPA adopted new standards for PM<sub>2.5</sub>, setting the standard at 15 micrograms per cubic meter (µg/m<sup>3</sup>) on an annual basis and 35 µg/m<sup>3</sup> for the 24-hour average—about half the limit of the previous standard.

Much of the particulate pollution can be attributable to emissions from automobiles, although federal motor vehicle emission control requirements are reducing those emissions significantly over time. Industry, wood stoves, wildfires, and snow blowers—among many other sources—also contribute to poor air quality. Because a major portion comes from automobiles, the DAQ’s Choose Clean Air program continues its public outreach by encouraging people to reduce vehicle trips and take mass transit when air pollution levels are on the rise.

On November 13, 2009, the EPA published the list of areas in the nation that do not meet the new federal PM<sub>2.5</sub> standards. This list included much of the Wasatch Front—including all of Salt Lake and Davis Counties and portions of Weber, Box Elder, and Toole counties, as well as the low-lying portions of Utah and Cache Counties. The State has until December of 2012 to draft a plan to the EPA on how it will achieve compliance that will, ultimately, improve the air quality for decades to come.



The Utah Clean Diesel Program, a clean air initiative that started in 2008, has been a successful collaboration between State and federal agencies, county and municipal governments, community and non-profit organizations, and industry groups. Over \$5.4 million in State and federal grants have helped 32 small businesses and 30 school districts purchase cleaner and more fuel efficient equipment for their operations, reducing emissions by over 25,000 tons and saving over 1.3 million gallons of diesel fuel over the life of the fleets; nearly \$5 million worth of fuel savings.

## Utah Clean Diesel Program

The following Clean Diesel projects have been completed to date:

- The Clean Diesel School Bus project retrofitted nearly 1,200 diesel-powered school buses throughout the state with emission control devices that are aimed to protect children and operators from harmful air pollutants emitted by the school bus's diesel engine. This project also replaced 27 older buses with new buses that meet a more stringent set of emissions standards.
- The Clean Diesel Trucking project installed auxiliary power units on 52 long-haul trucks. These units reduce fuel consumption and diesel emissions by providing climate control and electrical power for the truck's sleeper cab and engine block heater during the driver's downtime. These devices use 80-90 percent less fuel than the truck's main engine.
- The Clean Diesel Agriculture project installed auxiliary power units on 32 trucks that support farm-based activities. This project also repowered, and replaced, 31 pieces of diesel equipment with cleaner, more fuel efficient machinery.

The Clean Diesel Program awarded over \$1.3 million in new grant funds, with an additional \$15. million coming from matching funds.

The Utah Clean Diesel Program continues to evolve with awards of over \$1.3 million in new grant funds, with participants matching nearly \$1.5 million of their own resources. The program, based on partnerships with a variety of sectors, including education, agriculture, trucking, and construction, intends to provide cleaner and more efficient transportation and equipment alternatives to Utah communities.

DAQ approved 477 tax credits for clean fuel vehicles in 2010.

- 1,200 diesel-powered school busses were retrofitted.
- 27 older buses with new buses.
- 52 long-haul trucks had auxiliary power units installed
- 32 farm trucks had auxiliary power units installed .
- 31 pieces of diesel equipment were repowered and replaced.

## Clean Fuel & Vehicle Technology Programs

### Tax Credits

Since the 1990s the State of Utah has offered a tax credit for clean fuel vehicles as an incentive for helping reduce air pollution. DAQ approved the most clean fuel tax credits in 2008, with 1,493 approved credits. Since then, the number has decreased to 474 approved in 2009 and 477 in 2010.

The Utah Legislature revised the state's Clean Air and Efficient Vehicle Tax Incentives program during the 2011 legislative session. Senate Bill 226 (SB 226) amended the definition of "air quality standards." The new definition includes plug-in electric drive motor vehicles that meet Tier II Bin 4 standards. SB 226 also reduced the tax credit amount for other clean fuel vehicles that meet the air quality and fuel economy standards from \$750 to \$605.

Utah's low natural gas prices have prompted a growing number of people to convert their vehicles to compressed natural gas. But the conversion kits must be EPA certified. Some self-conversion kits on the market do not meet EPA standards and can be both dangerous and dirty.

### Grants & Loans

Through the Utah Clean Fuels and Vehicle Technology Grant and Loan Program, which is supported by Petroleum Violation Escrow (PVE) settlement money, DAQ received applications from nine different entities and 11 different projects statewide. DAQ was able to fund nine projects that include the purchase of two CNG transit buses, four refueling stations, nine CNG garbage trucks, and the conversion of 13 vehicles to run on CNG.

Annually, a total of \$250,000 to \$500,000 for grants and \$250,000 for loans are available to help cover the cost of converting a vehicle to operate on clean fuels, for the purchase of Original Equipment Manufacturer clean fuel vehicles, for the retrofitting of diesel vehicles, and for the purchase of fueling equipment for public and private sector business and government vehicles.

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## Uintah Basin

The EPA, under the National Environmental Policy Act, is mandated to document current air pollution levels and lessen current and projected adverse impacts through mitigation strategies. Localized monitoring in the three-state area (western Colorado, eastern Utah, and southwestern Wyoming) has revealed degraded air quality in regard to ozone and Nitrogen oxide (NO<sub>x</sub>), leading federal and state agencies to realize more information is needed as energy development in the region is considered. Because of a common need for a comprehensive set of air quality assessment tools, the stakeholders—EPA Region 8, the Bureau of Land Management, the USDA Forest Service, the National Park Service, and the states of Utah, Colorado, and Wyoming—are cooperating on measures to improve air quality.

The Utah component of the first phase of this project included the deployment of two air monitoring stations, one at Price and the other at Fruitland. The data from these two sites will be entered in a data warehouse being developed under the second phase of the project. Work conducted under the Three-State Pilot Project will be directly applicable to the ozone studies currently underway in the Uintah Basin.

The National Park Service has been measuring summertime ozone since 2005 in Dinosaur National Monument, located near Vernal, Utah, and since 2006 in Colorado National Monument, located near Grand Junction, Colorado. The EPA began measuring year-round ozone at two sites on the Ute Indian Reservation, located near Redwash and Ouray, in 2009. The official air quality levels for the Uintah Basin are currently in compliance with the ozone National Ambient Air Quality Standards (NAAQS). However, data collected from the two tribal sites during the winter of 2010 indicated that high ozone levels are occurring in the Basin during the middle of winter. This finding was unexpected, since ozone is normally an air pollutant that is formed during the summertime when high temperatures and bright sunshine occur.

A wintertime specific ozone study funded by the Uintah Basin Impact Mitigation Special Service District was conducted by the Energy Dynamics Lab and Utah State University in the winter of 2010/11. Data collected from 18 temporary and permanent air monitoring stations placed throughout the Basin found elevated wintertime ozone concentrations during temperature inversion events when snow covered the ground. The highest values were found in the central basin area with many exceeding the ozone NAAQS.

During the winter of 2011/12, an expansive, cooperative study lead by DEQ commenced to help understand how ozone is formed within the Basin during wintertime inversion conditions. The answer to this question is crucial to implementing appropriate and effective strategies for mitigating high ozone levels. Researchers from the National Oceanic and Atmospheric Administration, several University research groups, the EPA, and DEQ, are working together on this unprecedented air quality study.

### Three-State Pilot Project

### Uintah Basin Ozone

Data collected from 18 air monitoring stations throughout the Uintah Basin showed elevated wintertime ozone concentrations during temperature inversion events when snow covered the ground.

## Uintah Basin 2012 Winter Ozone Study

- **What:** The Utah Division of Air Quality is coordinating the Uintah Basin 2012 Winter Ozone Study this winter starting in January and running through March with an intensive research period focused on the month of February when the highest likelihood of temperature inversions, snow cover, and elevated ozone levels are expected. Preliminary results and conclusions from the study are scheduled for the following July.
  - **Why:** The Study is needed to understand how ozone is formed in the Basin during wintertime inversion conditions. Understanding the chemical pathways that are unique to the Basin’s wintertime situation is crucial to implementing appropriate and effective strategies for mitigating high ozone levels.
  - **Who:** The Study is a joint effort of world-class atmospheric researchers from the USU/Energy Dynamics Lab, the National Oceanic and Atmospheric Administration’s (NOAA) Chemical Sciences and Global Monitoring Divisions, the University of Colorado’s Institute of Arctic and Alpine Research, and the Utah Division of Air Quality. This is by far the largest, most complex air quality study conducted within the State of Utah to date.
  - **Cost:** The Study is broadly supported financially by numerous agencies, including the Uintah Basin Impact Mitigation Special Service District, Western Energy Alliance, Bureau of Land Management—Utah Office, and the Environmental Protection Agency-Region 8. The contribution total is nearly \$3 million. The State of Utah, NOAA, and the University of Colorado-Boulder also made significant in-kind equipment contributions to this study.
  - **Goal:** Identify effective, appropriate mitigation strategies that can be implemented to reduce the chemical precursors to wintertime ozone formation in the Basin. Protect the health and economic base of local citizens.
- **Research:**
    1. Distributed Basin-wide ozone and precursor measurements to determine the spatial extent.
    2. Long-term monitoring of ozone and key precursors at two “super sites,” Roosevelt and Horse Pool, to provide trends against which energy production increases and mitigation work can be evaluated.
    3. Intensive atmospheric chemistry studies to understand the chemical pathways and what the limiting formation precursors are.
    4. Development of a detailed, complete inventory of emissions sources in the Basin, including information on location, operation, and pollutants emitted.



## Indoor Air: Radon

Radon is an odorless gas and the second leading cause of lung cancer. Only smoking causes more lung cancer deaths. The Division of Radiation Control's (DRC) Indoor Radon Program, funded by the State Indoor Radon Grant from EPA, attempts to reduce the indoor radon concentrations in homes throughout the state to concentrations less than the EPA's current action level of 4.0 picocuries per liter of air. DRC does this through public outreach and by providing individualized assistance to homeowners and public agencies on all aspects of the indoor radon hazard problem. For the past couple of years, DRC has seen a substantial increase in radon testing and mitigation.

Radon awareness is continuing to rise in Utah. For the year 2011, approximately 3,740 short- and long-term radon tests were conducted throughout the state, resulting in approximately 755 mitigation systems installed in residential housing. Included in that number are homes built with radon resistant new construction (RRNC) techniques.

Year	Radon Tests	Radon Mitigations
2011	4,236	755
2010	3,353	596
2009	2,231	457
2008	2,243	629
2007	904	316
2006	2,700	372
2005	900	150

The Radon Program has continued its longstanding cooperative alliance with Intermountain Health Care's Women and Newborn Services and works in partnership with the Utah Department of Health, the American Cancer Society, the American Lung Association, the Utah Safety Council, the Wasatch Front Regional Council, the Huntsman Cancer Institute, the Utah Association of Local Health Departments, and other community groups to provide accurate information and awareness about Radon to the general public.

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## Energy & Climate

Energy is one of the four priorities or cornerstones of Governor Herbert's administration. He appointed Amanda Smith to head that charge as the Governor's Energy Advisor and in the spring of 2011 the Energy Advisor and the Governor's Office released *Energy Initiatives and Imperatives: Utah's 10-Year Strategic Energy Plan*. Among the recommendations of that document was the creation of an energy office to serve as an energy advocate and to facilitate the efficient and responsible development of Utah's diverse and plentiful energy resources.

The 2011 Legislature, under HB 475 by chief sponsor Representative Roger Barrus (R-Centerville) and co-sponsor Senator Kevin Van Tassell (R-Vernal), created the Office of Energy Development (OED) to work with regulated utilities, rural electric cooperatives, and municipal power providers on a proactive basis to guide energy development plans toward the balanced vision of the Governor's 10 Year Strategic Energy Plan.

In 2011 a \$1.2 million renewable energy rebate program was fully allocated in just 2.5 months, and those dollars leveraged well over \$5 million of private investment.

The Office of Energy Development manages tax credit and incentive programs that support renewable energy and energy efficiency efforts throughout Utah, and so moderate the electric grid's base load growth curve. In 2011, a \$1.2 million renewable energy rebate program was fully allocated in just two and a half months, and those dollars leveraged well over \$5 million of private investment. This program and others have supported dozens of small businesses and hundreds of jobs during a time of economic lethargy, and have helped improve the monthly bottom line for hundreds of families and businesses in Utah.

85 Utah companies either hired new employees or saw an increase in their business due to Utah Home Performance.

Another successful Office of Energy Development initiative is the Utah Home Performance Program. The goal of the program was twofold: to establish infrastructure for a whole home retrofit market in the State, and to help Utah homeowners save energy. The program was started with a \$4.5 million budget, which increased to a \$5.7 million budget due to the great success of the program. Eighty-five Utah companies either hired new employees or saw an increase in their business due to Utah Home Performance. Leveraging \$7.5 million in home retrofit investment, almost 1,300 homes across Utah will see an average energy savings of 29 percent for years to come.

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Additionally, through its partnership with USTAR and its coordination of Utah's Research Triangle (USU, U of U, BYU), the Office of Energy Development fosters the development of technologies that will be key to the continued development of Utah's energy resources in the context of increased federal regulations, particularly in the realm of air quality. These relationships allow OED to bring the State's position to bear on funding and prioritization decisions, so that research and commercialization groups can better serve the economic development interests of Utah.

In 2011 some partners in the Western Climate Initiative, of which Utah had been a part, formed WCI, Inc. to implement an emissions trading program. Utah and five other states opted not to participate in that program, and thus withdrew from WCI. These states can continue to collaborate on energy efficiency, carbon sequestration, and other related initiatives through a new initiative called North America 2050. This collaboration between former WCI states and two other regional groups seeks to reduce GHG emissions while creating economic opportunities. Utah may contribute to North America 2050, with the goal of advocating for the most appropriate roles for federal and state governments.

## Climate Change

Over the past four years, various Utah businesses and government agencies have joined The Climate Registry (TCR), a non-profit organization designed to serve as a single repository, or clearinghouse, for public and private entities to report their GHG emissions. TCR has developed reporting protocols for the Electric Power Sector, Local Government Operations, and Oil and Gas Production, and continues to develop reporting protocols for other key sectors to ensure that the quality of GHG emissions data is consistent and that the data can be used for multiple purposes.

## The Climate Registry

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## Midway City to Rededicate Newly Renovated Historic Town Hall

Built in 1941 with local labor, the Midway Town Hall has undergone a major energy-efficiency and seismic-restraint renovation. Located on the site of Old Fort Midway in the civic and recreation center of the town, the structure is in continuous use as a gathering place and meeting center. A rededication ceremony for the Hall was held on November 7.

Under an award from the Energy Conservation Block Grant Program managed by Utah's Office of Energy Development, the City was able to install new insulation and the latest heating and lighting energy-efficiency technologies. The installed upgrades will allow the City to save energy and reduce long-term operating expenses. Annual energy savings for the building are estimated at just over 200 kBTU/year. The energy efficiency awards for the project were funded through the American Recovery and Reinvestment Act (ARRA) and administered through the U. S. Department of Energy.



## **Carbon Capture & Geologic Sequestration**

After Governor Huntsman signed Utah Senate Bill 202 into law in March 2008, the Energy Resource Procurement Act was amended to require the development of recommended rules governing carbon capture and geologic sequestration (CCGS).

On November 15, 2010, the CCGS Work Group reported recommended rules to the Legislature's Administrative Rules Review Committee. As a follow-up task, DEQ Executive Director Amanda Smith submitted a letter to the Legislative Rules Committee on December 1, 2010, identifying two outstanding legal issues: 1) pore space ownership, and 2) post-closure long-term liability, which the Utah Attorney General's Office is evaluating.

On December 10, 2010, the EPA published their Final Rule for Class VI UIC wells for geologic sequestration of carbon dioxide. The Division of Water Quality (DWQ) is currently evaluating options for implementing the Class VI Rule, which includes applying for State primacy, or allowing direct implementation by EPA Region 8 until Utah has a demand for commercial carbon sequestration.

Currently, there are no proposals for commercial carbon sequestration in Utah, and none anticipated in the near future. The only known carbon sequestration proposal in Utah is the Southwest Partnership's Phase III Gordon Creek Research Project, which is funded by the Department of Energy. DWQ may regulate the Gordon Creek Project using the UIC Class V Experimental Technology Well permit process on the grounds that Gordon Creek is an experimental research project, the CO<sub>2</sub> injectate is not from an emission source, and there is no intent to use the injection well in the future for a commercial, long-term geologic sequestration facility.

Photo by Ed Hickey



Protecting the environmental quality of land is integral to that ensuring Utah's air is clean and its water pure. To this end, DEQ focuses on the prevention, management, control, and cleanup of toxic chemicals.

## Cleaner Land

Under the Emergency Planning and Community Right to Know Act of 1986, and the Pollution Prevention Act of 1990, facilities must report their releases of more than 650 toxic chemicals and chemical compounds to the EPA and State officials. It is important to note that the majority of the releases include properly permitted activities allowable under federal law. This data is available to the public through the Toxics Release Inventory (TRI). The latest annual TRI data available is for 2010, which represents an increase in air and land releases and a slight decrease to water release. Preliminary indications are that mining operations that generate "waste rock" are most likely the cause for this increase in land releases.

## Toxic Chemicals

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### Toxic Chemical Releases

	2010	2009
Air Releases	8.5 million	6.9 million
Land Releases	201.9 million	161.6 million
Water Releases	102,145 K	101,109 K

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Under the Emergency Planning and Community Right to Know Act of 1986, and the Pollution Prevention Act of 1990, facilities must report their releases of more than 650 toxic chemicals and chemical compounds to the EPA and State officials.

## Reclamation Projects

During 2011, 66 sites were mitigated, with a total of 4,443 UST sites cleaned up; 67 new sites were identified in addition to 476 sites currently undergoing remediation.

The Utah Division of Environmental Response and Remediation (DERR) is charged with protecting public health and Utah's environment by administering the superfund and State voluntary cleanup programs in order to clean up chemically contaminated sites and ensuring that underground storage tanks are properly managed. DERR also helps the EPA implement its Brownfields action agenda to protect public health and return impacted, or potentially impacted, properties to a state of beneficial economic re-use.

During 2011, 66 sites were mitigated, with a total of 4,443 Underground Storage Tank sites cleaned up as of October. To date in 2011, 67 new sites were identified to be added to the 476 sites currently undergoing remediation.

## Superfund

During 2011, DERR staff worked closely with the EPA to achieve milestones in the Superfund Program. There are 25 formal sites on the superfund National Priorities List (NPL) with five having been deleted and one removed, making a total of 19 "Active" Sites. Construction has been completed at Midvale Slag, Eureka Mills, and the Davenport and Flagstaff Smelters. The EPA signed an administrative order and consent for US Magnesium in 2011.

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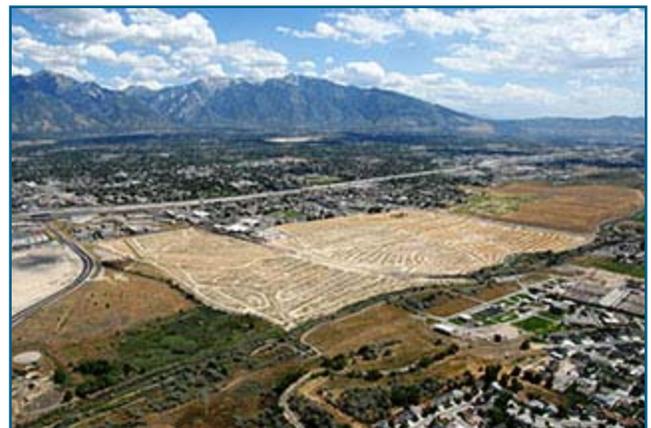
## Midvale Slag Cleaned for Redevelopment

The Midvale Slag Site, located in Midvale City, with a small portion extending into Murray City, is a former smelting facility along the Jordan River covering about 446 acres. Five separate smelters located on or near the site operated from 1871 to 1958. In 1991, the site was placed on the Superfund National Priorities list due to groundwater and soil contaminated with heavy metals, including lead, arsenic, chromium, and cadmium.

DEQ teamed with the EPA on a cleanup plan, with work beginning in 1996, which included the removal of soil in affected residential areas at the northern end of the site, the capping of contaminated soil and smelter waste in the southern areas, and the installation of a groundwater monitoring system to verify that the Jordan River remains unaffected.

The riparian area along the Jordan River is currently undergoing stabilization to prevent potential riverbank erosion. As part of this work, a damaged sheet pile dam in the river was replaced by a steel-reinforced boulder structure. DEQ took the lead for managing the

residential cleanup at the north end of the site and for the installation of a groundwater monitoring system, and partnered with the EPA and Midvale City to ensure the remedy would be compatible with mixed residential and commercial land uses. Redevelopment is underway at the site, now known as Bingham Junction.



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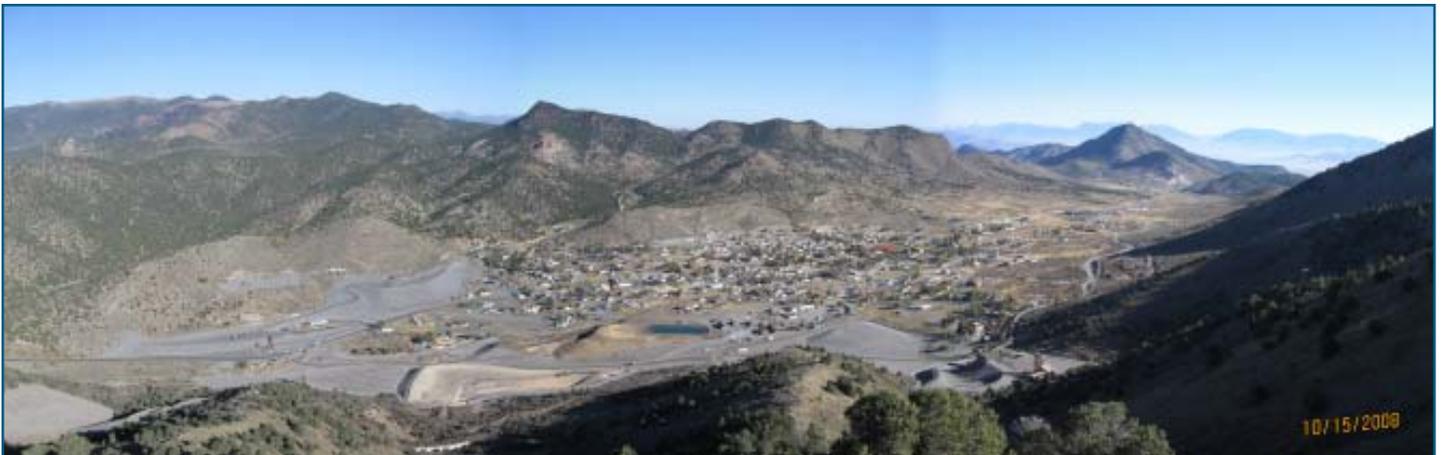
## Eureka Mining Town Gets Cleaned Up

The Eureka Mills Site is located in the City of Eureka in Utah's historic Tintic Mining District. It was founded in 1870 upon the discovery of a high-grade mineralized outcrop containing silver and lead, as well as other minerals including gold, copper, and arsenic and was extensively mined until 1958. The properties on the south side of the Valley, adjacent to residences and businesses, was largely contaminated by large waste rock piles and associated waste material resulting from mining operations.

In 2000, DEQ and the EPA began investigating impacts of mining activities in Eureka and found high concentrations of lead and arsenic in the soil, combined with elevated blood-lead levels in children. Cleanup began in 2001, and the site was placed on the Superfund

National Priorities List in 2002. Seven years later the cleanup was completed.

About 700 residential properties were addressed through removal of contaminated soil and replacement with clean soil or rock covers. Mine waste piles, which posed a human health risk, were capped with soil or rock covers. Potentially responsible parties, such as the mine owners, performed portions of the work with EPA and DEQ oversight. The success of the cleanup actions has been demonstrated by the fact that recent blood test results indicate that the lead levels in Eureka's children have dropped considerably since before the cleanup began.



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## Voluntary Cleanup Program

The Utah Legislature in 1997 passed a law that created the Voluntary Cleanup Program (VCP). The VCP provides a mechanism to rehabilitate brownfields and allows for property owners or others seeking to cleanup environmentally impaired sites to do so with DEQ oversight. As of October 2011, 35 Certificates of Completion have been issued under the VCP, and over 850 acres have been returned to a state of beneficial reuse.

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## UDEQ VCP/Brownfields Success Story

Block 37a in Ogden was the site of a salvage yard as well as auto repair shops and the former Ogden Iron Works. Several buildings on the block had been vacant for years due to suspected soil contamination and to the general deterioration of the downtown area.

With a letter of support from DEQ, Ogden City applied for and received a brownfields assessment grant from the EPA to investigate the entire city block. The investigation revealed soils impacted with metals, volatile organics, and petroleum compounds. As a result, Ogden City applied to and entered DEQ's Voluntary Cleanup Program in December 2000. The City removed the contaminated soils and

received a Certificate of Completion from DEQ after completion of the project, which helped facilitate redevelopment. With assistance from DEQ, the site was designated No Further Remedial Action Planned by the EPA in 2004.

The site currently houses an office building complex leased to the Internal Revenue Service and is an important part of Ogden City's downtown revitalization efforts. Based on information from Ogden City, approximately 900 new jobs were created as a result of this development and over 21 million dollars' worth of private development was leveraged as part of the IRS Phase 1 project.



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As of October 2011, 35 Certificates of Completion have been issued under the VCP, and over 850 acres have been returned to a state of beneficial reuse.

The Division of Solid and Hazardous Waste (DSHW) provides regulatory oversight of the management of hazardous waste generated by industries and businesses, and oversight of non-hazardous solid waste generated by individuals, businesses, and industry.

Approximately 4.4 million tons of non-hazardous solid waste was disposed in permitted landfills during 2010, the most recent reporting year for non-hazardous waste generation and management. An additional 123,000 tons was disposed in approved solid waste incinerators.

The Division continues to provide compliance assistance to small businesses which generate hazardous waste. In 2011, the Division conducted 229 compliance assistance visits at small businesses throughout the state.

## Waste Management

### Recycling Successes

DSHW provided technical assistance to a group of e-waste stakeholders drafting proposed legislation for introduction in the 2011 legislative session. Legislation was passed that requires manufacturers to provide an annual report to the Division that lists eligible programs or systems offering collection, transportation, reuse, or recycling services to consumers for electronic devices. The legislation also requires manufacturers of electronic devices sold in Utah to

establish and implement public education programs to inform consumers of available recycling services for electronic devices. The Division's oversight of the Mercury Switch Removal Program resulted in 44,237 mercury switches removed from automobiles and 97.32 pounds of mercury collected that might have otherwise been put in the trash and ultimately ended up in a landfill or put into the air as emissions during scrap car recycling.

The Waste Tire Recycling Program continues to achieve success. During 2011, nearly 100 percent of all tires collected in Utah were recycled or reused, amounting to 43,000 tons, or 2.6 million tires recycled.

In 1993, the Utah Legislature enacted the Used Oil Management Act, which required DEQ to develop a statewide Used Oil Recycling Program. The volume of used oil recycled in 2010 from household participation in the Do-It-Yourself Program increased to 543,219 gallons from 460,041 gallons the previous year. However, the total amount of used oil recycled statewide, which includes businesses and DIYer used oil, decreased in 2010 to 10,526,867 gallons, down from 12,978,532 gallons the previous year.

### Pollution Prevention

#### Waste Tire Program

#### Used Oil Recycling

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## UDOT I-15 Construction Project and UTA Commuter Rail South Project

DEQ assisted the Utah Department of Transportation (UDOT) during the Interstate-15 Construction Project in Utah County. DEQ provided technical assistance relating to management of soil and groundwater contamination at the Pioneer Crossing exit and assisted UDOT by issuing an Enforceable Written Assurance during the

purchase of a contaminated parcel in Orem. DEQ also assisted the Utah Transit Authority during the Commuter Rail South Project by overseeing the removal of more than 2,000 cubic yards of contaminated soil, just west of the former Murray Smelter. This area will be used as a future Park and Ride Lot for railway commuters.

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### Federal Facility

The Deseret Chemical Depot, located in Tooele County, is on schedule to begin closure in 2012 after it finishes the mission of destroying 45 percent of the nation's chemical weapons stockpile. Complete closure of the facility is expected to take several years. As of November 2011, approximately 99 percent of the mustard chemical agent has been destroyed. Only a few 155 mm projectiles remain. One hundred percent of all stockpiled GB and VX nerve agents in containers and munitions, which were stored at the Depot, have been destroyed. The only bulk agent left is a small amount of Lewisite and GA that are being treated in a newly permitted incinerator.

As of November 2011, approximately 99 percent of the mustard chemical agent has been destroyed.

Approximately 4.4 million tons of non-hazardous solid waste was disposed in permitted landfills during 2010. An additional 123,000 tons was disposed in approved solid waste incinerators.

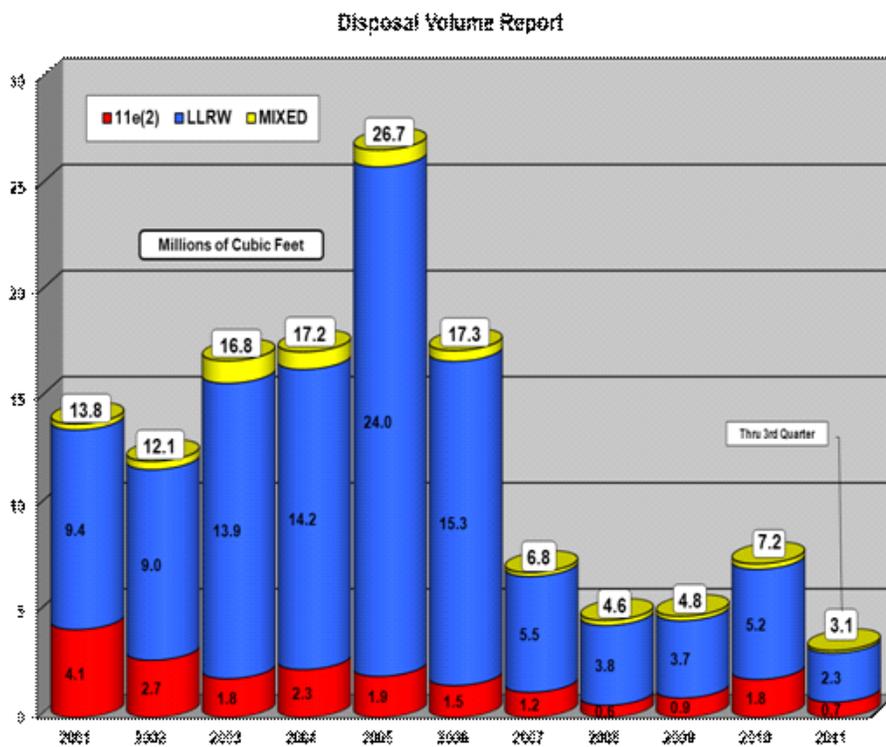


Nearly 100% of all tires collected in Utah in 2011 were recycled or reused, amounting to 43,000 tons, or 2.6 million tires recycled.

The volume of used oil recycled in 2010 from household participation in the Do-It-Yourself Program increased to 543,219 gallons from 460,041 gallons the previous year.

On the national front, Chem-Nuclear, LLC, a subsidiary of EnergySolutions, Inc., in Barnwell, South Carolina, stopped taking waste from anyone outside of the Atlantic Compact on July 1, 2008. Chem-Nuclear receives all classes (A, B, and C) of low-level radioactive waste. The U.S. Ecology Facility at Hanford, Washington, serving the Northwest Compact (Alaska, Hawaii, Oregon, Washington, Montana, Wyoming, Utah, and Idaho) also receives all classes of low level radioactive waste and partners with the Rocky Mountain Compact (Colorado, New Mexico, and Nevada) in receiving limited amounts of low-level radioactive waste. A new facility, Waste Control Specialists (WCS) in Texas has received a license to dispose of low-level wastes from Texas and Vermont as well as a separate disposal option for federal government wastes. On November 10, 2011, WCS announced the opening of the Texas Low-Level Radioactive Waste Disposal Compact Facility for the disposal of commercial low-level radioactive waste.

## Low-Level Radioactive Waste Disposal



Volumes of waste received for disposal at EnergySolutions continue to decline from a peak 26.7 million cubic feet in 2005 to the current year. This volume represents Class A low-level radioactive waste, uranium mill tailings, and mixed waste.

## Depleted Uranium

On April 14, 2010, the Radiation Control Board approved a new rule that requires EnergySolutions to conduct a performance assessment before disposing of depleted uranium. Depleted uranium became an issue when the U.S. Department of Energy (DOE) announced in early December 2009 that it plans to ship 11,000 tons of depleted uranium (DU) from the Savannah River cleanup in South Carolina to EnergySolutions' low-level radioactive waste facility in Clive, Utah. Included in a pending license condition is a requirement that EnergySolutions must remove the waste if the site safety analysis (performance assessment) demonstrates that depleted uranium could not be safely disposed at the landfill for at least 10,000 years. The DU that was shipped to EnergySolutions is currently stored in a building until future resolution. Governor Gary Herbert and DOE negotiated a deal that prevented the remaining shipments from coming to Utah pending a site-safety analysis. DU is a by-product of the uranium enrichment process that becomes more radioactive over time. EnergySolutions sought to dispose of the waste before the Nuclear Regulatory Commission (NRC) completed a new rule on disposal of significant quantities of DU in three years. Despite pressure from some environmental groups, in 2009 the NRC decided against reclassifying DU as a "hotter" waste—a move which would have changed disposal requirements. DU is classified as a low-level (or Class A) radioactive waste. It has some commercial use. However, demand is currently much less than the amounts generated. Disposal is the only option for the rest. Under federal law, the Department of Energy is required to accept DU from an NRC licensed uranium enrichment facility. DU can also be accepted by a licensed commercial disposal site. EnergySolutions' Clive facility holds a Class A radioactive waste license and currently has DU disposed at its facility.

## Blending of Low-Level Radioactive Waste

On October 13, 2010, the NRC revised its position that provides the states an opportunity to pursue rule-making that would allow large-scale blending of "hotter" radioactive resins with low-level radioactive resins. The NRC directed staff to develop a revised Branch Technical Position regarding the circumstances under which large scale blending is acceptable. Until such time, licensing actions received by NRC or Agreement States for large scale commercial blending facilities should be reviewed on a case-by-case basis.

On April 13, 2010, the Radiation Control Board adopted a position paper on waste blending, noting that it is opposed to waste blending when the intent is to alter the waste classification for the purposes of disposal site access. The issue of blending higher concentrated low-level waste (Class B and C waste) with lower concentration waste (Class A) waste has come to the forefront because of lack of disposal access for 36 states for Class B and C radioactive waste. One of the problematic low-level waste streams is ion exchange resins generated at nuclear power plants throughout the United States.

The Nuclear Energy Institute and the Electric Power Research Institute have conducted studies on blending during the previous two years. These resins,

small beads of plastic, remove radioactive material from waters used for cooling nuclear reactors. Depending on how often the resins are changed, they can be the higher classification B and C low level Wastes when classified for disposal. The NRC estimates that power plants throughout the United States generate roughly 85,000 cubic feet of resins annually. Class A waste makes up ninety percent of the annual resin production.

A proposal to blend ion-exchange resins from power plants at EnergySolutions Bear Creek Facility in Tennessee is under evaluation. Under this effort, higher activity resins would be blended with lower activity resins to generate a Class A waste and eventually shipped to the Clive facility. Currently NRC only has guidance to address the blending of waste. Blending of waste typically occurs during cleanup of a site where lower and higher concentrations of waste are blended into a homogeneous final form. Blending of clean and concentrated soils for purposes of dilution to change waste classification is not allowed under the current guidance. Blended materials require disposal at a licensed low-level waste facility. Over the last year or so, the NRC has come out with guidance for reviewing proposals for large-scale blending of low-level radioactive waste. In addition, the Radiation Control Board initiated rulemaking in early 2011 [UAC R313-25-8(1)]. This new rule mandates the Executive Secretary determine if a new performance assessment (PA) is required before a Low Level Waste facility can receive any radioactive material for land disposal. This new rule formally took effect on April 4, 2011.

Denison Mines (USA) Corporation (formerly International Uranium Corporation), operates a mill in Blanding, Utah, where it extracts uranium from ores and alternate feed materials. Table 1 shows the amount of conventional ore and alternate feed that have been processed from 2007 to September, 2011.

## Uranium Mills

Year	Conventional Ore (tons)	Alternate Feed (tons)
2007	0	44,136
2008	250,746	500
2009	144,434	166
2010	233,744	308
2011 (up to Dec 1)	159,909	1,507

The NRC estimates that power plants throughout the US generate roughly 85,000 cubic feet of resins annually.

**Tailings Cells** The Denison Mines White Mesa Uranium Mill Facility re-lined Tailings Cell 4A in 2008 and Tailings Cell 4B was constructed in 2010 and approved for use in January, 2011.

On June 3, 2010 Denison Mines notified the DRC by telephone that on June 2, 2010 an accumulation of fluid was discovered within the Tailings Cell 1 leak detection system. An initial pH paper test indicated a pH of 2.0 to 3.0, telling the DRC that the fluid originated from Cell 1. To repair the liner, Denison Mines lowered the fluid level to 5613.10 feet Above Mean Seal Level (AMSL) by pumping the solution into another cell. This eliminated the flow of wastewater to the leak detection system and allowed Denison Mines to identify damage to the liner and to perform repairs. When the liquid level was allowed to return, the system remained dry until fluid was again registered on August 7, 2010. This indicated that repairs had not addressed all the damage. Following negotiations, the DRC approved a new repair plan which is currently being implemented. The wastewater elevation within Tailing Cell 1 has been at or below 5,613 feet AMSL since the middle of August 2010 and no wastewater has been observed in the Cell 1 leak detection system since then.

**Groundwater Issues** As to date, there have been two contamination plumes (chloroform and nitrate) identified at the White Mesa Uranium Mill, as follows:

### **Chloroform**

There are currently 27 monitoring wells associated with the chloroform plume. Repeated groundwater sampling by Denison Mines and DRC has confirmed concentrations in excess of the State's Groundwater Quality Standards. The sampling appears to have defined the plume's eastern and southern boundaries. Impacted wells are along the eastern margin of the site and are upgradient or cross-gradient from the tailings cells. Contamination appears to have been caused by laboratory wastewater disposal activities that pre-dated mill operation. Denison Mine's predecessor used chloroform in the laboratory and then dumped the excess into the septic system. This practice no longer exists. Laboratory water is now discharged to Tailing Cell #1. A Corrective Action Plan (CAP) is near completion and should be ready for public comment this winter. In the interim, Denison Mines is currently using a hydraulic control system (pump and treat) to address the plume.

### **Nitrate**

During preparation of a Permit Modification for the Denison Mines White Mesa Mill in 2008, DRC staff identified that a plume existed based on nitrate contamination in a number of wells on site. On January 27, 2009, DRC and Denison Mines entered into a Stipulated Consent Agreement wherein Denison Mines agreed to conduct a contamination investigation to determine the source. In spite of two-plus years of investigation, site conditions makes it difficult to determine the total number, locations, magnitude of contribution, and

proportion of the various sources at the site. As a result, it was agreed that resources would be better spent in developing a Corrective Action Plan rather than continuing with further investigations. A Stipulated Consent Agreement was signed by both parties on September 30, 2011 and mandated that Denison Mines submit a CAP on or before November 30, 2011. Denison Mines submitted the CAP on November 29, 2011. The final approved CAP will be released for public comment and a meeting will be held to give the public a chance to comment on the proposed path forward.

Uranium One Utah (formerly Plateau Resources) near Ticaboo, Garfield County, has submitted a two year extension request regarding its Radioactive Material License (RML) renewal license. Currently, the RML will expire April 30, 2012, and the Licensee has requested a two year extension to submit the required renewal application. A 30-day public comment period commenced on October 24, 2011, when published in the Salt Lake Tribune and the Wayne and Garfield County Insider and posted on the DRC Web site. The public comment period ended on Friday, November 25, 2011. Based on the comments received, the Executive Secretary has granted the Licensee the extension and has requested that specific information be provided to the DRC on or before the initial expiration date of April 30, 2012.

Rio Algom Mining LLC has a current Utah Radioactive Material License (RML No. UT1900481) for a former uranium milling facility in the Lisbon Valley, San Juan County, Utah. The RML includes groundwater monitoring requirements and concentration limits which are based on previous modeling approvals of an Application for Alternate Concentration Limits, approved by the NRC based on a May 11, 2004 license amendment.

The State of Utah obtained primacy to administer the Uranium Mill program in Utah from the NRC in August 2004, and DRC included the conditions previously approved by the NRC in the Utah RML. Based on DRC concerns regarding the ACL concentrations, the ground water monitoring compliance requirements and compliance limits were revised and included in an amendment of the RML on March 6, 2006. All changes to the concentration limits were based on groundwater concentration break through curves (groundwater model).

Based on this finding, DRC and Rio Algom agreed on confirmatory actions to be undertaken in response. Rio Algom agreed to hire an independent consultant, qualified to review pertinent information and documents, including the existing ACL model, relevant laboratory data and associated technical information, and provide potential additional groundwater modeling (revised ACL model) as appropriate, and provide the Executive Secretary a detailed written action plan and schedule for the investigation.

Based on Rio Algom's responses related to these confirmatory actions and further discussion with Rio Algom, the DRC determined that additional site assessment and refinement of the conceptual site model is needed before a

determination is made to revisit or revise the existing groundwater model (ACL model). This entails the collection of additional site field samples and aquifer tests as well as a review of site groundwater monitoring procedures.

During a meeting amongst DRC staff, Rio Algom and Montgomery and Associates on October 13, 2011, it was agreed that a Work Plan and Schedule for the additional field work would be submitted to DRC by December 16, 2011. In addition, it was agreed that a license amendment was warranted regarding the work plan and schedule. The License Amendment will be subject to a 30-day public comment period scheduled to start on or around December 21, 2011.

Photo by Lonnie Shull



Utahns and countless visitors continue to enjoy safe drinking water and many relatively pristine waterways for numerous industrial, agricultural, and recreational purposes. Utah is the second driest state in the nation, so water is a precious resource needed to maintain our communities and many aspects of our economy. Given its importance, water conservation efforts are critical, but so is the need to maintain the quality of water if this precious resource is to continue to meet the needs of current and future generations.

## Cleaner Water

Significant strides have been made in protecting water resources since passage of the 1972 federal Clean Water Act (CWA). The vast majority of Utah's waters are of sufficient quality to meet the uses required of them, but 30 percent are partially impaired. High levels of mercury continue to be found in some fish species in waters throughout Utah. The Division of Water Quality (DWQ) continually works toward not simply identifying problems, but searching for solutions for continued improvement in waters throughout the state.

DWQ continues to make strides to better understand the Great Salt Lake—a truly unique ecosystem that has worldwide significance as a refueling stop for millions of migratory birds. In 2011 DWQ helped establish a cooperative monitoring agreement for the Great Salt Lake. This collaborative program combines the efforts of State, federal, and local governments to ensure that chemical and biological data are collected efficiently, saving all involved time and money, to meet multiple management needs. Data collected through these efforts will improve management decisions, helping to ensure the lake's uses as both a nationally important ecosystem and as a critical part of Utah's economy.

In 2011, DWQ collaborated with several economists to instigate a study that will ascertain the contribution of clean water to Utah's economy. Elsewhere, studies have found that degradation of water quality—particularly excessive algae growth—can negatively impact such factors as outdoor tourism and property values. This past summer, two surveys were mailed to Utahns to evaluate the net economic impact of clean water programs to our economy.

## Protecting, Maintaining, & Restoring Utah's Waters

Nationwide, all waters are classified with numerous beneficial uses that reflect the services that each water body provides to society and the environment. In Utah, these uses include protection of aquatic organisms (fish and other important organisms upon which they depend), recreational uses, agricultural uses, and drinking water sources. Standards, developed with numerous scientifically rigorous studies conducted over the past 30 years, are applied to each of these uses and represent the core of Utah's efforts to ensure that healthy waters can continue to be enjoyed by all. Simply put, standards are the rules that establish pollutant concentrations that ensure protection of the beneficial uses of all waters.

DWQ continues to work directly with stakeholders, including leaders from agriculture, industry, and environmental non-profits, to improve Utah's water quality standards. An ongoing standards workgroup is currently evaluating several aspects of these rules including: developing more refined biological uses so water quality goals are clearly understood, and developing a more transparent process for federally required permits (401 Certifications) that are sometimes required for large develop activities. The central goal of these collaborative efforts is to ensure the protection of water quality without placing unreasonable or unnecessary burdens on industry.

## Measuring Current Conditins

One important role of DWQ is to monitor and assess all of Utah's 14,250 miles of rivers and streams and nearly 3,000 lakes and reservoirs to ensure that water quality goals are met. One way to accomplish this task is to build cooperative monitoring programs that help ensure that data collected by several State, federal, and local agencies can meet multiple objectives. With oversight from a recently formed Statewide Monitoring Council, Utah continues to maintain cooperative monitoring efforts that are among the strongest in the nation.

All monitoring information collected by DWQ and other State and federal agencies needs to be interpreted to evaluate whether important beneficial uses remain protected. These assessments, which require the evaluation of hundreds of thousands of data points, are summarized in a biennial report to Congress. Among other things, this report identifies "impaired" waters that are in need of water quality improvement. Also, this report evaluates which causes of impairment represent the greatest threat to water quality, which helps determine where resources can be most efficiently and effectively used to realize water quality improvements. DWQ will issue a draft of this *Integrated Report* in 2012, which will include several new analytical approaches that we believe will more accurately and transparently convey water quality information.

One important role of DWQ is to monitor and assess all of Utah's 14,250 miles of rivers and streams and nearly 3,000 lakes and reservoirs to ensure that water quality goals are met.

Once impaired waters are identified, the next challenge is to determine the sources of impairment and how to limit and control them to restore all of the water's beneficial uses. This is accomplished through a water quality study required by the Clean Water Act called a "Total Maximum Daily Load" (TMDL). A TMDL study calculates the maximum amount of pollution a body of water can receive and still meet water quality standards.

DWQ partners with many other federal, State, and local agencies, organizations and stakeholders to combine resources in implementing the watershed protection program. An example of that effort is the Utah Nonpoint Source Pollution Management Program, which helps landowners obtain financial assistance to implement water quality improvement projects on private lands.

A watershed study was completed in 2011 for Upper Emigration Creek in Salt Lake County that identifies the causes and likely sources of *E. coli* impairment and best management practices needed to restore water quality. Studies are also ongoing for the Jordan River in Salt Lake County, Nine Mile Creek in the Tavaputs Plateau and Red Creek Reservoir in Iron County in cooperation with local, State, and federal stakeholders.

The Weber River watershed was targeted for water quality improvement projects in 2011, including East Canyon Creek in Summit County and the Ogden River in Weber County. The Weber River and its tributaries will continue to be the priority focus area into 2012 as the DWQ institutes a rotating basin approach toward planning, implementing, and reporting on water quality improvement efforts. This rotating basin approach will coincide with the collection of critical water quality data before and after the projects are completed to enable project sponsors to accurately determine the water quality benefits of the project.

Another way DWQ protects the quality of our waters is by issuing permits to all entities that discharge pollutants to surface waters, including discharges of domestic and industrial wastewater, and more diffuse sources like storm water. These permits establish allowable concentrations of pollutants and monitoring requirements to ensure that industry can continue to operate without degrading the uses of Utah's waters. DWQ utilizes an inspection program coupled with review of water quality data from each discharger to ensure that the terms of these permits are followed. Also, a careful review of each permit is conducted every five years to accommodate growth or respond to unforeseen environmental consequences of these discharges.

Numerous studies have identified storm water as one of the most significant threats to water quality in suburban and urban areas. Federal law requires that some industrial facilities and construction projects develop plans to minimize storm water problems and apply for a permit from DWQ, who ensures compliance. Currently there are approximately 1,580 active construction storm water permits and 573 presently active industrial storm water permits. Storm water permits are also required for municipal separate storm sewer systems that serve communities with more than 10,000 people and a population density

## Improving Utah's Waters

### Permitting Discharges

Currently there are approximately 1,580 active construction storm water permits and 573 presently active industrial storm water permits.

of at least 1,000 people per square mile. These municipal permits require that DWQ work with communities to develop a comprehensive storm water management program that evaluates potential sources of storm water pollution, and then establishes ordinances and public outreach efforts to minimize potential water quality problems. Currently 78 communities in Utah have municipal storm water permits and have developed storm water management programs.

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DWQ oversees 127 domestic and industrial entities that have individual permits to discharge treated industrial or domestic wastewater into Utah's waters.

DWQ currently oversees 127 domestic and industrial entities that have individual permits to discharge treated industrial or domestic wastewater into Utah's waters. These include industries or cities and towns which have treatment facilities that discharge effluents to surface waters. Another 167 specialty permits have been issued, which cover discharges from activities such as coal mines, construction de-watering and pipeline hydro testing projects, fish hatcheries, drinking water plants, ground water remediation projects, biosolids (sewage sludge) processing projects, and industrial pre-treatment facilities. In addition there are 56 permits for "Concentrated Animal Feeding Operations (CAFO)," which is discussed in a separate section of this report.

Permits typically define a sampling schedule that allows DWQ to ensure that the discharge does not impair the beneficial uses of the receiving water. On average, there was a 94 percent compliance rate for all the regulated domestic and industrial facilities in 2010.

## Groundwater Protection

The Groundwater Protection Section, within DWQ, administers two primary programs to protect the quality of Utah's groundwater resources:

- the federal Underground Injection Control (UIC) Program (R317-7); and,
- the State Ground Water Quality Protection Program (R317-6).

167 specialty permits have been issued, covering discharges from activities such as coal mines, construction de-watering and pipeline hydro testing projects, fish hatcheries, drinking water plants, ground water remediation projects, biosolids processing projects, and industrial pre-treatment facilities.

The UIC Program protects underground sources of drinking water by reviewing and approving numerous small-scale injection activities such as storm water dry wells, ground water remediation wells, and domestic underground drain fields. A major effort is underway to identify motor vehicle waste disposal wells that have been banned by EPA, and close or issue permits for these wells. The UIC Program also issues permits for aquifer storage and recovery operations to allow municipal water districts to capture spring runoff water and store it in drinking water aquifers for future use. A UIC permit was issued to Magnum Solutions in December 2010 for the construction of four new Class III solution mining injection wells in Millard County near Delta. The injection wells will be used to create four natural gas storage caverns in a bedded salt deposit, with each cavern having a gas storage space of 9.8 million barrels. Each storage cavern will take approximately two years to complete. Regulatory oversight of the natural gas storage operation will be transferred to the Division of Oil, Gas, and Mining after completion of the storage caverns. Since the EPA published their Final Rule for Class VI injection wells for geologic

carbon sequestration on December 10, 2010, UIC Program staff have been evaluating options for implementing the Class VI Rule. Currently, there are no proposals for commercial carbon sequestration in Utah, and none are expected in the near future. The only known carbon sequestration proposal is the Southwest Partnership's Gordon Creek Phase 3 research project funded by the Department of Energy.

The Groundwater Quality Protection Program protects ground water by issuing permits to agricultural and industrial waste management units that have the potential to discharge pollutants into groundwater. Agricultural waste management units include wastewater lagoons at large concentrated animal feeding operations, such as dairies and swine farms, while industrial waste management units include ash disposal facilities at fossil fuel power plants, and wastewater ponds and tailings impoundments associated with mining and processing operations for copper, gold, phosphates, tar sands, and uranium.

The two primary elements of groundwater discharge permits are:

- best available technology to minimize subsurface discharge; and,
- compliance groundwater quality monitoring.

Currently there are 37 active groundwater discharge permits regulating about 93 facilities. This program also reviews aquifer classification petitions for approval by the Water Quality Board. The Board has approved 12 aquifer classifications throughout the state, including the recent classification for the principal basin-fill aquifer in the East Shore area of Davis County.



There was a 94 percent compliance rate for all the regulated domestic and industrial facilities in 2010.

There are 37 active groundwater discharge permits regulating about 93 facilities.

## Utah's Wastewater Project Assistance Program

To date, Utah's Wastewater Project Assistance Program has provided almost \$519 million in loans and \$47 million in grants to communities to plan, develop, and construct wastewater treatment, pumping, and conveyance facilities.

The Utah Wastewater Project Assistance Program provides funding for high-quality water and wastewater projects through the State Revolving Fund (SRF), Utah Wastewater Loan Fund, and Hardship Grant Fund. To date, this program has provided almost \$519 million in loans and \$47 million in grants to communities to plan, develop, and construct wastewater treatment, pumping, and conveyance facilities. Recently, this program expanded to provide grants for nonpoint source projects as well.

The Water Quality Board received almost \$20 million in stimulus funding through the American Recovery and Reinvestment Act of 2009 (ARRA). To date, over \$19 million of this amount has been spent constructing worthwhile wastewater projects.

## Great Salt Lake



Photo by Charles Uibel

The Great Salt Lake is of hemispheric importance as both a refueling stop for millions of migratory birds and a nesting area for others. Eighty percent of Utah's wetlands surround the lake. Tens of millions of dollars are generated for Utah's economy from the mineral extraction industry, duck hunting clubs, and the brine shrimp industry, which are all dependent on the vitality of the lake. Nature enthusiasts flock to the lake because of its ecological importance. Utahans draw a significant amount of their heritage and identity from the lake. Overall, the lake is a truly unique resource to Utah. DWQ is committed to protecting this ecologically and economically unique ecosystem. Our goal, shared by most of the recreational, industrial, and commercial users, is that water quality remains sufficient to protect and maintain the beneficial uses of the lake and its surrounding wetlands.

In 2011, DWQ made significant efforts toward understanding the overall water quality of the open waters and wetlands.

The lake's uniqueness—it is very salty—complicates DWQ's ability to apply water quality practices applied to the rest of Utah's waterways. DWQ must employ special techniques for monitoring, assessment, and regulation that are specific to this saline ecosystem. Developing water quality programs to protect the lake is a DWQ priority.

In 2011, DWQ made significant efforts toward understanding the overall water quality of the open waters and wetlands. In cooperation with State, local, and federal agencies, the Division established a baseline monitoring plan designed to measure and assess the current condition of the lake and track trends of contaminants of concern that may adversely affect the lake's beneficial uses.

We are in the final phases of recommending an assessment method for the impounded wetlands surrounding the GSL that will allow us to measure the overall health of these critical nesting habitats and we continue to support efforts to understand the overall effects of mercury in the lake by assessing mercury concentrations in the ecosystem. In addition to efforts specific to water quality, DWQ is actively involved in supporting other State agencies' management of the lake. This includes participation in the revision of the Department of Natural Resources, Division of Forestry Fire and State Lands Great Salt Lake Comprehensive Management Plan and Mineral Leasing Plan and staff support to the Great Salt Lake Advisory Council that was created by the legislature to advise on the sustainable use, protection, and development of the Great Salt Lake.

When mercury is deposited in waterways, bacteria convert it to the toxic methylmercury that builds up in the tissue of fish and aquatic wildlife. Human exposure to methylmercury is primarily through eating contaminated fish.

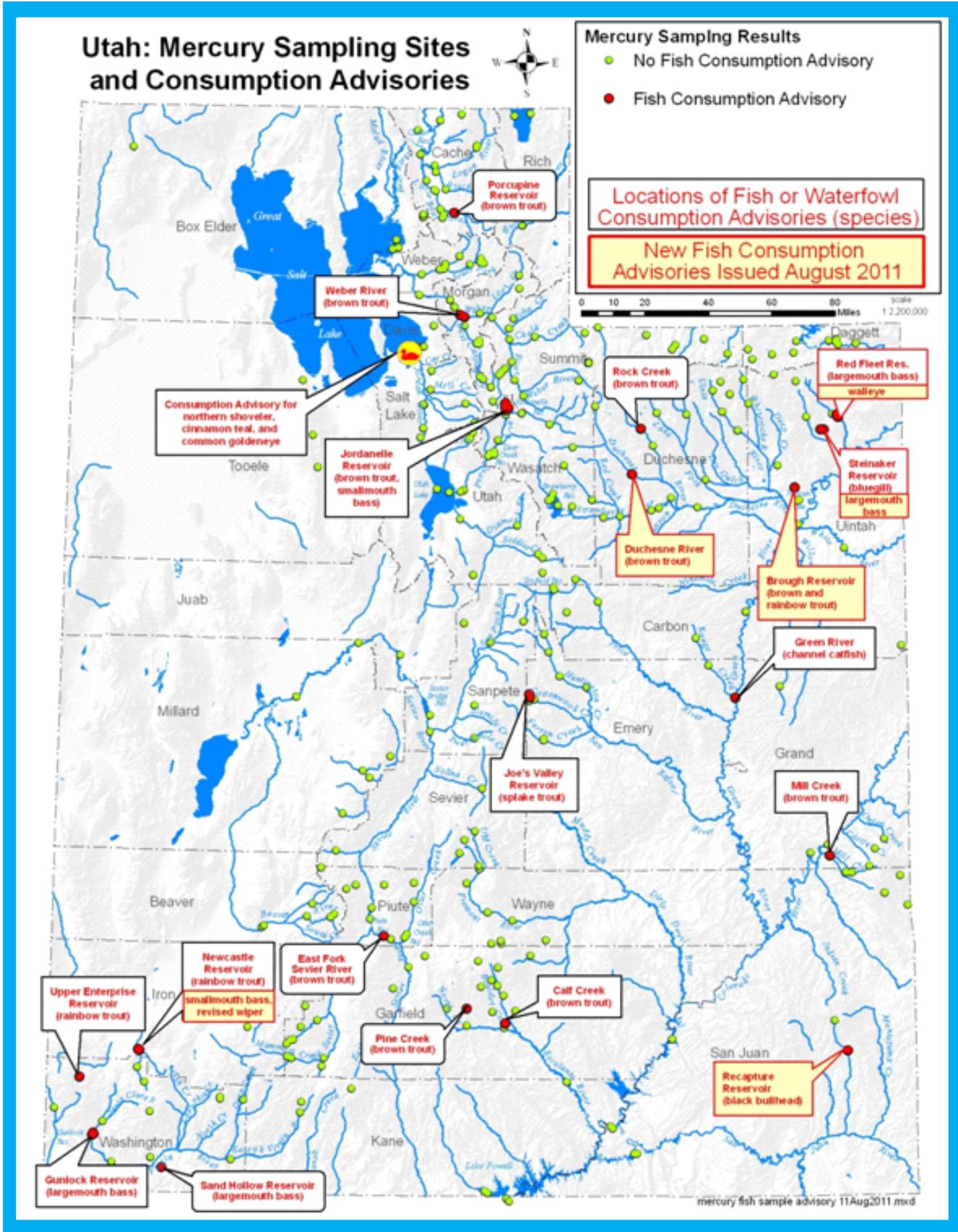
DWQ, in partnership with the Utah Department of Health and the Utah Division of Wildlife Resources (DWR), continues to sample and test mercury concentrations in fish from Utah's waterways. To date, 35 species of fish from 322 water bodies have been tested. When the average mercury concentration in a species within a waterbody exceeds the screening level, fish consumption advisories are issued that warn us to limit our consumption of that fish from that particular waterbody. Pregnant woman, nursing mothers, and young children are especially sensitive to the toxic effects of mercury. To date, 19 of the 322 waterways have fish consumption advisories.

Since 2005, DWQ has facilitated and chaired the Statewide Mercury Workgroup, which is composed of stakeholders from a broad base of local, State, and federal agencies, industry, and non-profit organizations. The objectives of the Workgroup are to provide the citizens of Utah current information about the concerns posed by mercury, share technical information, and coordinate and collaborate mercury investigations in Utah to maximize limited resources. All past meeting materials and notices of future meetings are posted at <http://www.mercury.utah.gov/>.

A multi-year investigation, led by the US Geological Survey, and funded by DWQ and DWR, began in 2010 to determine whether special pumps can be used to lower elevated levels of mercury in New Castle Reservoir. The Division is hopeful that this project will lead to remediation of mercury contamination in those waterways that have fish consumption advisories. The project is scheduled to be completed in 2012, and ongoing results have been presented to the Mercury Workgroup.

## Mercury in Fish

To date, 35 species of fish from 322 water bodies have been tested. To date, 19 of the 322 waterways have fish mercury consumption advisories.



## Animal Feeding Operations

The Animal Feeding Operations/Concentrated Animal Feeding Operations (AFO/CAFO) Committee is a partnership of DWQ, the Utah Department of Agriculture and Food, the Utah Farm Bureau, the Utah Association of Conservation Districts, Utah State University (USU) Extension, the United States Department of Agriculture Natural Resources Conservation Service, the EPA (Region 8), and Utah's animal producer groups.

In 2001, the AFO/CAFO Committee developed the Utah Strategy which is a compliance assistance agreement to help animal feeding operations with compliance to environmental regulations to improve water quality. AFOs and CAFOs are animal production facilities where animals are confined, such as dairies and feedlots.

On December 31, 2008, the Utah Strategy expired; a new draft strategy has been prepared to continue the Utah Strategy work. DWQ has entered into two agreements to provide funding to the Utah Farm Bureau and the Utah Association of Conservation Districts to continue compliance assistance. Also, DWQ entered into a contract with Utah State University Extension to provide educational outreach to AFOs and CAFOs in the state to implement the Utah Strategy.

Working through the Utah Strategy and the new contracts, experts of the AFO/CAFO Committee partnership provide assistance to AFOs and CAFOs through compliance and technical assistance. The agricultural partners prepare nutrient management plans, help design new waste containment structures, and assist in the implementation of proper management practices at AFOs and CAFOs. The partners assist producers in obtaining cost-share funding to address manure management problems.

As of December 31, 2008, nearly 3,000 facilities have been assessed. Of those, 393 are AFOs with compliance problems. Since 2001, 98 percent of the AFOs with compliance problems are reported to have had management plans prepared and 92 percent are in full compliance.

In early 2012, DWQ will amend Utah Administrative Code and will issue a new Utah Pollutant Discharge Elimination System CAFO General permit to reflect federal CAFO rule changes. Compliance assistance and educational outreach will be provided by DWQ and the agricultural partners. This will include compliance worksheets for producers, educational workshops throughout the state, and information on the USU Producer's Web site.

Although more work is imminent, the Utah Strategy, AFO/CAFO Committee, and the agricultural partnership have thus far been successful in improving water quality in Utah by reducing water quality impacts from AFOs and CAFOs. This success is a result of cooperation and commitment by Utah's environmental and agricultural agencies and organizations and to address water quality concerns.

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## Drinking Water

The vast majority—99.92 percent—of Utahns drink water from approved public water systems, while a small number of individuals and businesses get their drinking water from private wells. Most public drinking water systems get their water from groundwater sources. DWQ helps protect groundwater sources from being contaminated by pollution, whereas Utah’s Division of Drinking Water (DDW) helps ensure that all of our citizens can enjoy clean and healthy drinking water by assisting with testing treatment and delivery systems, conducting inspections of water systems, and by enforcing the Drinking Water Source Protection Program. These programs are a success, as 88.6 percent of the community public water systems meet all health-based standards of the Safe Drinking Water Act.

99.92 percent of Utahns drink water from approved public water systems.

DDW’s programs are intended and designed to ensure that Utah’s citizens are drinking safe water. Through a grant from the Utah Department of Homeland Security, DDW assists water systems in developing Emergency Response plans and Vulnerability Assessments. The training includes protecting sensitive information and computer systems, how to develop tabletop exercises, NIMS certification, Web site awareness, and Water Agencies Response Network (WARN) membership.

88.6 percent of the community public water systems meet all health-based standards of the Safe Drinking Water Act.

Over 2,500 water distribution and water treatment certificates have been issued in 2011 through testing by the DDW. Once an operator successfully passes an exam the operator is required to receive continuing education in order to maintain and renew their certification. As a result of the professionalism of the water operators within the state, water systems have fewer compliance problems, and the number of approved systems has increased.

Over 2,500 water distribution and water treatment certificates have been issued in 2011 through testing by the DDW.

DDW has a plan review and operating permit process to ensure proper design and construction of public drinking water facilities, such as water treatment plants, wells, springs, storage tanks, and pumps. In Fiscal Year 2011, the Division of Drinking Water staff received plans and conducted engineering reviews of public drinking water projects, and issued 280 plan approvals, 227 operating permits, and 86 exception-to-rule letters.

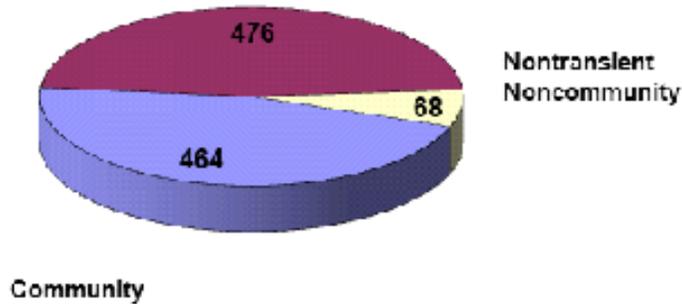
## Public Drinking Water Systems

As of December 2011, Utah has 1,007 water supply systems. A public water system is defined as any water system, either publicly or privately owned, which provides drinking water for 15 or more connections, or 25 or more people, at least 60 days of the year. These include community systems serving people year round; non-transient non-community water systems that serve workers at a factory; and, transient non-community water systems such as seasonal campgrounds or highway rest stops.

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### Active Public Water Systems in Utah



### Myton Flooding

The town of Myton lost a section of their water main near a river bank due to the excessive runoff that caused floods in the area in the spring of 2011. Portions of the Myton system were left without water. DDW gave technical assistance on the flushing and disinfection of the water main that was depressurized. Rural Water Association of Utah (RWAU) assisted in the physical set up and disinfection op-

eration of the system. DDW and RWAU were able to keep the system pressurized using fire hoses, until a permanent solution was reached. The Division also helped install a valve that will allow them to shut down the system in future emergencies. This partnership helped Myton recover from this incident more quickly, and helped protect the public's health.



Fire hoses used to keep system pressurized.



New shut off valve.

## Utah's Water Loan Programs

State Revolving Fund financial assistance is used to help construct new water treatment plants, replace aging or inadequate water pipes and storage tanks, develop new sources of drinking water (wells and springs), and perform planning studies to determine community needs and best alternatives to correct system problems.

During Fiscal Year 2011, the State of Utah provided a total of \$26.9 million to 39 different water system improvement projects. Since 1983, \$267.37 million has been awarded to 351 projects.

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