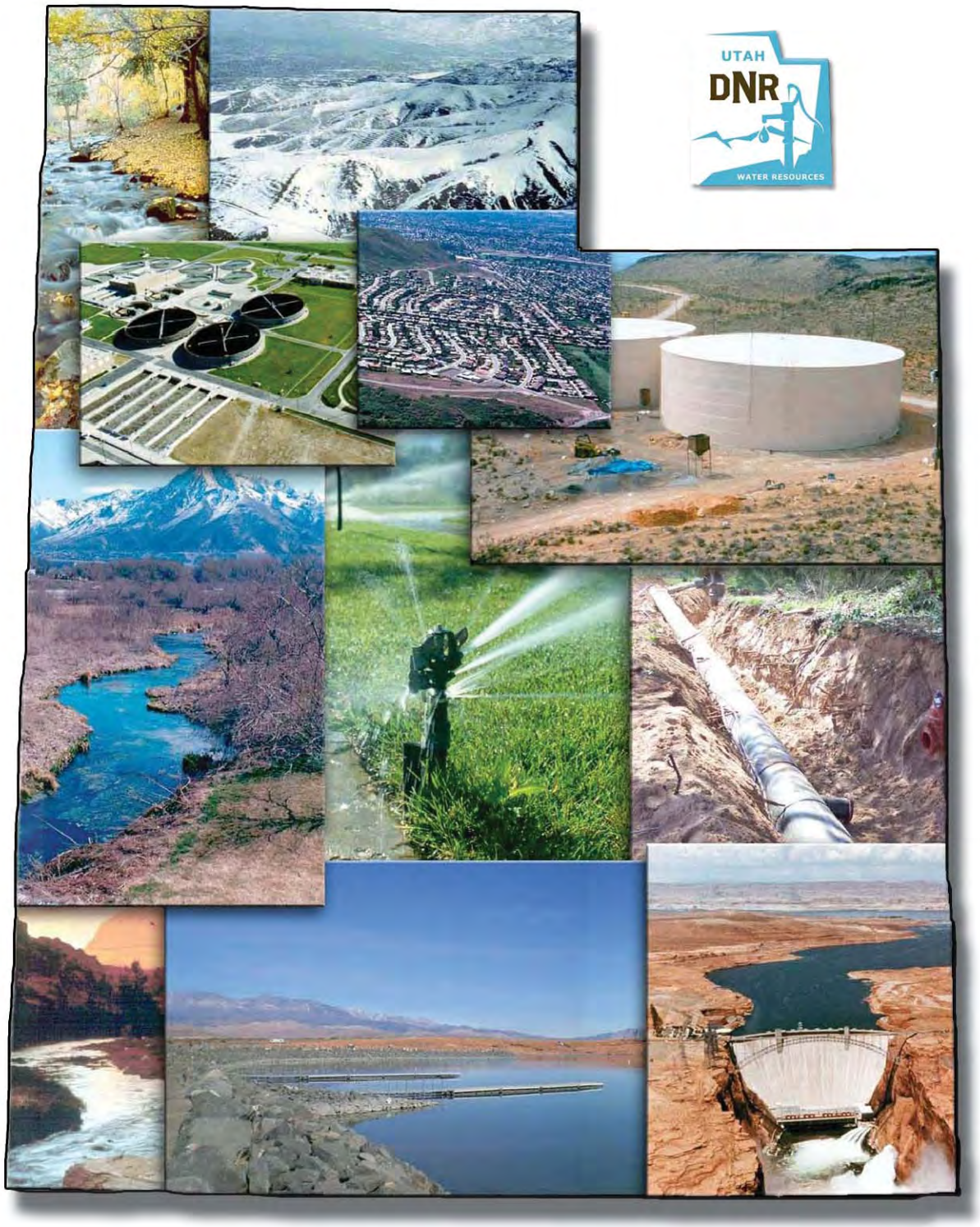
The Cost of Water in Utah

"Why Are Our Water Costs So Low?"



THE COST OF WATER IN UTAH

"Why are our water costs so low?"

Prepared by

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This report was prepared under the direction of Todd Adams, Assistant Director of the Division of Water Resources, by a project team consisting of the following staff members:

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Other staff members provided significant assistance with reviewing, editing and preparing the document for publication.

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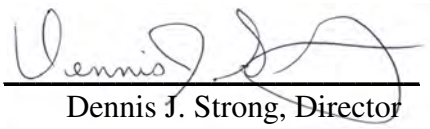

Dennis J. Strong, Director

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INTRODUCTION

The Utah Division of Water Resources (DWRe) has frequently asked and been asked the question, "Why are our water costs so low?" Questions about water costs usually stem from concerns about water conservation, namely that the cost of water is too low to encourage conservation. The cost to consumers of water provided by water suppliers in Utah is well below the national average and regionally one of the lowest. The Utah Division of Drinking Water (DDW) has regulatory authority over water providers and collects water rate data for the State of Utah. The DDW regularly collects this information for the State of Utah and compiles it in an annual report. However, the DWRe felt it would be valuable to evaluate this issue to accomplish its mission of water planning, conservation and education. This report will not address the issues concerning conservation (this subject is comprehensively covered by the DWRe in the "M&I Water Conservation Plan"); however, this report analyzes the cost of water in various communities and the factors that contribute to low water cost.

Salt Lake Valley

COST COMPARISONS

There are few national reports that offer statistics calculating the per capita cost of water. The DDW compiles yearly information regarding Utah's water cost per capita, and Raftelis Financial Consultants, INC. (RFC), in conjunction with the American Water Works Association (AWWA), generates biennial data for the entire nation.

The DDW, in conjunction with the Utah Division of Water Rights (DWRi) and the DWRe, conducts a survey of community drinking water systems within the state. This report utilizes the results of the Billing and Rate Portion of the 2006 Community Water System Survey that was compiled by the DDW. The report indicated that there were 462 registered community water systems in the State of Utah, serving a reported population of 2,510,426 residents. Of the 462 community systems, 322 participated in the most recent survey (2006). These 322 systems serve a reported population of 2,291,825 residents. The majority of the respondents provided satisfactory responses to questions regarding water bill information and consumer costs. From this survey, DDW found that the average monthly consumer water bill in 2006 was $37.11 and the cost of water per 1,000 gallons was $1.34. However, not every state compiles a similar report, making it difficult to compare results.

Child using community drinking water system

A biennial survey has been produced by RFC in cooperation with the AWWA since 1996 to aid water and wastewater utilities in its benchmarking efforts. The RFC/AWWA 2006 Water & Wastewater Rate Survey includes the participation of 256 utilities. Rates, as well as other operational and financial metrics, are organized by size and location. Table 1 on the following page, derived from the RFC/AWWA 2006 database, shows the average cost of water per 1,000 gallons, residential and combined (residential, commercial, institutional and industrial) monthly bills for Utah, other western states and a few eastern states. The table shows average monthly water bills vary greatly from state to state. Based on this data, Utah is shown as having an

average cost of water per 1000 gallons of $1.34, the same cost reported by the DDW. **Based on the numbers shown in the table, the cost of water per 1,000 gallons in Utah is 43% below the national average and 45% below the western states average.** The residential and combined water bills of Utah also illustrate that the state has low water bills when compared to other areas of the country.

Table 1 Cost of water for selected states

AVERAGE MONTHLY WATER BILLS[1,2,3]

State	$/1000gallons	Residential ($)	Combined ($)[4]
Selected Western States			
Idaho	1.26	23.16	30.57
Utah	**1.34**	**23.47**	**31.27**
Arizona	2.48	35.23	48.19
Colorado	2.54	31.43	43.54
Wyoming	2.67	24.30	33.14
Nevada	2.80	44.42	60.78
New Mexico	2.50	27.07	38.63
California	2.92	32.81	57.78
Selected Eastern States			
Georgia	2.51	22.13	24.46
Michigan	2.70	20.70	23.54
New York	3.27	41.92	44.77
Interior Western U.S. Average[5]	2.31	30.23	42.99
Western U. S. Average[6]	2.42	28.58	33.19
Eastern U. S. Average[6]	2.75	22.66	28.15
National Average	2.37	27.61	32.48

NOTES:

1. Data source (unless noted): 2006 American Water Works Association (AWWA) database.
2. Average for each state is based only on the cities included in the AWWA database.
3. All monthly billings are from water sales income only.
4. The combined billing includes all categories: residential, commercial, institutional and industrial usage.
5. The average of the seven listed western states, based on the cities included in the AWWA database.
6. The eastern and western averages include all states east or west of the Mississippi River, respectively.

REASONS FOR CURRENT LOW WATER COSTS

There are several factors that contribute to the cost of water in every state across the country. These are; climate, geography, water quality, types of delivery systems, energy costs and funding from federal, state and private sources.

Utah's climate and geography make it possible for high quality water to be gravity fed into the larger urbanized areas of the state. After Utah was settled, there were several large water development projects funded by the state, as well as the federal government. These, coupled with water use conversion from agricultural irrigation to Municipal and Industrial (M&I) and low energy costs, have all contributed to low water costs in Utah.

Climate and Geography

Utah has a unique climate and geography that allows for low water costs. From Brigham City to Cedar City (the I-15 corridor) the average annual precipitation is 16 inches, although during the summer months the precipitation is limited to 4-7 inches. The majority of Utah's population lives, along this corridor, west of the Wasatch Mountains, in what is considered an arid high desert climate. However, in the Wasatch Mountains the average annual precipitation is 40 – 50 inches. This is from an annual mountain snowfall range of 200 inches to 500 inches. Fifty inches of precipitation is roughly what is received on an annual basis in many of the nation's southeastern states, well known for their high rainfall.

Snowpack in the Wasatch Mountains

This is a very important fact concerning the cost of water in Utah. The snowpack acts as a storage reservoir of billions of gallons of water, storing the water until the summer months. When the snowpack begins to melt in May and June the canyons east of the I-15 corridor fill with water, delivering some to reservoirs and lakes. Much of this water enters ground water aquifers, which flow to springs or can be pumped from the ground and used as needed by communities lining the Wasatch Mountains. Water taken from groundwater aquifers requires

little treatment since a lot of the particulates have been filtered as the water seeped through the underground rock and soil. In the western portion of Utah, including the Wasatch Front, all of the excess water flows into the terminal water bodies of the Great Basin, the most famous being the Great Salt Lake.

When the Mormon Pioneers first settled in Utah, the available mountain snowpack was an important factor as to why they settled where they did. In 1847, the early pioneers began to prepare the Salt Lake Valley for agricultural uses. This involved the construction of ditches and canals that would bring the summer run-off out of the canyons and onto adjacent developed farm lands. In addition to settling at the base of snow covered mountains, the Mormon Pioneers established their communities atop fairly large ground water aquifers. This allowed many communities to utilize ground water when the mountain snowpack was no longer delivering sufficient water (late summer, fall and winter months).

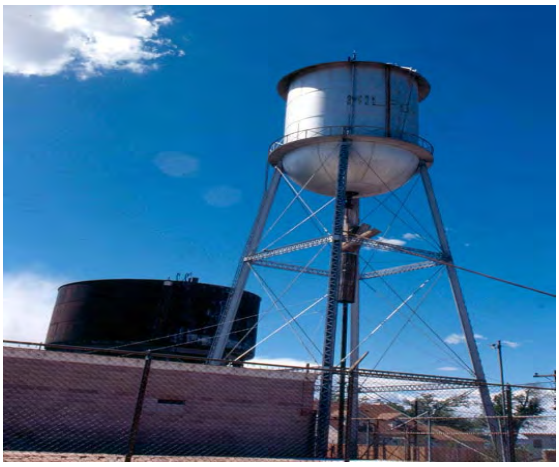
Diamond Fork Pipeline

Of course, Utah is not the only state where communities were established due to geographic convenience. The major early settlements in California were established near ocean ports, beaches and producible agricultural lands. However, many of these communities grew rapidly and now have a greater water demand than the local supply; therefore, they are required to convey water over hundreds of miles from other watersheds. Transporting their water over these long distances increases the cost of water. Other western cities having similar arid climate to Utah's, such as Denver, Boise and other more arid cities such as Las Vegas and Phoenix, established their communities close to good water supplies. However, due to population increase, the local water demands are now greater than the capacities of those original water supplies. Thus, these communities must also convey water from other sources outside of their watershed, increasing the cost to provide water for their communities. In comparison, many of Utah's communities are located at the mouths of canyons,

near their water sources and their demand doesn't yet exceed supply. It requires less energy and less infrastructure to transport and treat their water supply. In turn, it is less expensive to deliver higher quantities of water to the residents of many communities in Utah.

Water Quality and Water Delivery Systems

As discussed previously, a large portion of Utah's water is obtained from the snowpack that acts like a large storage reservoir. The snowpack is made up of relatively clean water that is usually gravity fed into actual reservoirs and then gravity fed to area treatment plants. The snowpack is considered clean because it is not exposed to pollution for extended periods of time. Every year there is a new snowpack that covers the mountain tops. Whereas, in many other parts of the country, major cities have water sources that have to be heavily treated prior to entering the drinking water system. Also communities that use snowpack as a water source are usually the first users of the water. In other parts of the country, many communities are downstream from other major communities and therefore are utilizing a degraded water source. A degraded water supply requires more frequent and extensive treatment of the water source, translating into higher cost for the users.



Traditional Water Tower vs. Typical Utah Water Tanks

Almost half of the treated water in Utah is gravity fed; this greatly reduces the necessity of additional energy to transport the water. In addition, some of the surface water conveyance systems are used to generate electricity, further lowering costs. Gravity fed systems eliminate the need for elevated water storage tanks in the system. The storage tanks that are required, in Utah,

Through these programs, Utah leaders were able to direct the planning and development of large-scale water storage and development projects. These projects provided water to irrigate the agricultural lands and for M&I needs. Utahns could then homestead and live in the arid state. Many of those early federal projects have been completely repaid to the federal government and are still in use. The only costs now are for operation and maintenance. Thus, many Utah communities are the beneficiaries of large, federally-financed water projects that are mostly paid for and still operational. This is yet another factor why many Utah communities can provide low cost water to their customers.

The State of Utah also has several state water funding programs which are seen as an investment in the local infrastructure and are designed to promote water development, conservation and safe drinking water. These programs are valuable in promoting Utah's economic growth. Most of the funding assistance from state agencies is provided to smaller cities, towns, special districts and irrigation companies. Collectively, the state programs have been effective in providing between 15 to 20 percent of the annual M&I water infrastructure funding. Of course, while the cost benefit is substantially greater to the individual community receiving the funds, overall, these programs have helped to keep water costs low in Utah.

State funded water project, Quail Creek Reservoir

Effect of State and Federal Funding Programs

The Utah Board of Water Resources works closely with water districts, irrigation companies, cities and towns statewide to develop new water sources and upgrade irrigation and community M&I water systems so that water usage can be carried out in a more efficient manner. Since the establishment of the Board of Water Resources in 1947 it has contributed more than $300 million for M&I projects. In addition, the state's Drinking Water Board has

Water Conservation

In a period of ten years (1995 – 2005) Utahns have reduced their overall water use from 320 gallons per capita per day (gpcd) to 260 gpcd (a 19% decrease). Shown in Figure 1 is the water use for public community systems since 1970. These systems serve 98% of all Utah residents. From 1980 to 1990 the increase in water use followed the same trend as the population. However since that time water use has decreased while population continues to increase. This decrease in per capita water use helps keep water costs low. The DWRe has set a goal to reduce per capita use further by 25% from the year 2000 to 2050. With this water conservation goal, the development of new sources will be delayed, saving millions of dollars. These saving are passed on to the end water user. Conserving water not only helps with monthly water costs for an individual user; it also helps mitigate costs increases incurred from new water developments. Thus, the recent reductions in per capita use, mainly the result of major statewide water conservation efforts, have also helped keep water costs low.

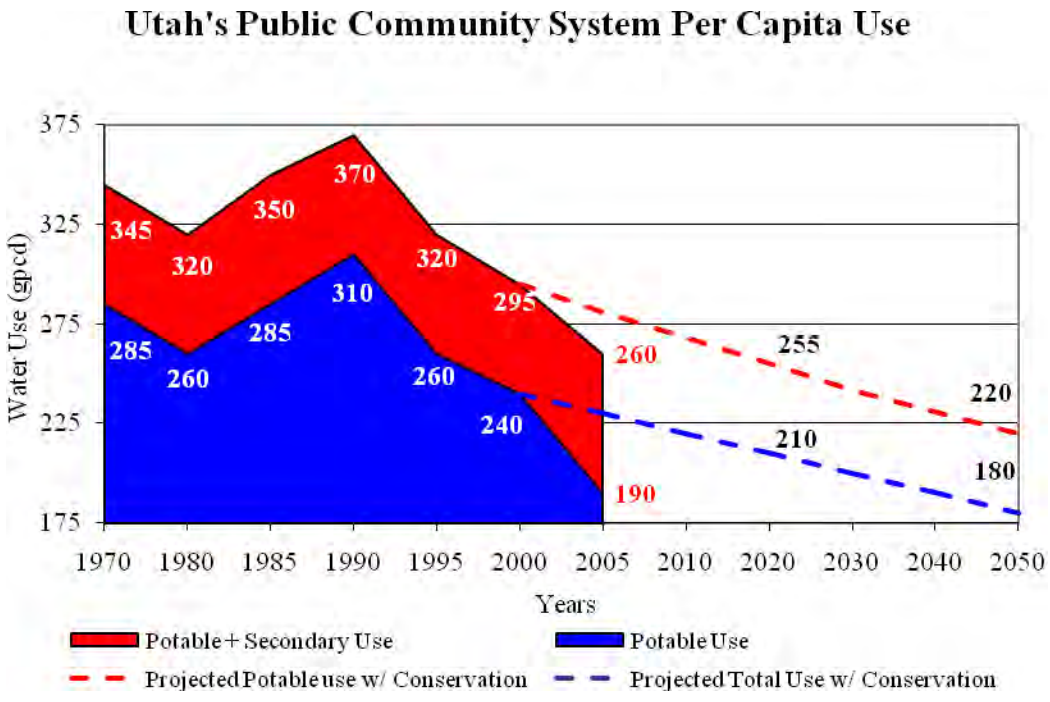


Figure 1 Utah's GPCD since 1970 with the projected goals for future GPCD
Source: DWRe *Municipal and Industrial Water Supply and Use Studies Summary*, 2009