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11 SECTION

Drinking Water

UTAH STATE WATER PLAN - WEBER RIVER BASIN PLAN

All public water systems complying with state and federal safe drinking water regulations supply safe drinking water to their customers.

11.1 Introduction

This section of the *Weber River Basin Plan* provides information and data associated with the treatment, distribution and regulation of public drinking water supplies.

11.2 Setting

Currently, 76 community and 95 non-community public culinary water distribution systems operate in the basin, and all are monitored by the Division of Drinking Water for adherence to state and federal drinking water regulations. These systems produce culinary water from an estimated 350 wells and six surface water treatment plants. The Division of Drinking Water maintains a current record of all public water system ratings.

The basin's annual M&I culinary water use in 1992 was 92,000 acre-feet. The projected increase in culinary water demand is expected to parallel population growth rates. A summary of public community water supply and use by supplier in 1992 is given in Table 11-1.

11.3 Organizations and Regulations

Regulations pertaining to public drinking water sources are enforced and/or administered by public agencies at the local, state and federal levels. These agencies have a regulatory responsibility to insure that the general public is provided with safe and reliable sources of drinking water.

11.3.1 Local Facility Owners and Operators

Federal, state, and local agencies are responsible for establishing and administering safe drinking water regulations and programs. Owners and operators of individual treatment and distribution systems are directly responsible for the quality of water delivered to the public within their respective service areas. The day-to- day operation of drinking water treatment facilities must assure compliance with state and federal water quality standards.

Verification that a treatment facility is operating within state and federal drinking water standards is through various monitoring programs established by state and federal regulations.

The *State of Utah Rules for Public Drinking Water Systems* specifically outlines the procedures plant operators must adhere to regarding the taking of water samples and the documentation of subsequent water quality analyses for submission to the Division of Drinking Water. Table 11-2 is a summary of currently operating water treatment plants. Weber Basin Water Conservancy District plans to upgrade plants 3 and 4 to nearly double current capacity.

Public water systems that, for any reason, pose a threat to public health must be reported to the Division of Drinking Water. This report generally includes the scope and nature of the threat with all necessary improvements to restore adequate water service. Follow up evaluations are conducted and used to revise system operational policies aimed at minimizing the likelihood of similar situations in the future.

11.3.2 State Drinking Water Regulations and Programs

Title 19, Chapter 4, of the Utah Code Annotated is referred to as the Utah Safe Drinking Water Act (USDWA). The act created the Drinking Water Board

Table 11-1
PUBLIC CULINARY WATER SUPPLY AND USE (1992)

Water Supplier	Population Served	Total Connections	Source	M&I Water Use (acre-feet)	Per Capita Use (GPCD)
WEBER COUNTY					
WASATCH FRONT AREA					
Bonta Vista W.I.D.	14,875	3,481	Spring/Wells/Wholesale	3,038	182
Hooper W.I.D.	8,106	1,700	Wells/Wholesale	1,596	176
North Ogden	12,766	1,375	Spring/Wells	1,574	110
Ogden	59,879	19,985	Surface/Wells/Wholesale	18,426	175
Pleasant View	4,062	820	Spring/Wells	835	184
Riverdale	6,630	1,476	Wells/Wholesale	2,563	345
Roy	24,216	6,849	Wells/Wholesale	3,144	116
South Ogden	10,229	3,962	Exchange/Wholesale	1,615	141
Taylor West Weber	6,630	1,123	Wells/Wholesale	2,525	340
Uintah	888	288	Spring/Wholesale	300	302
Uintah Highland	4,219	691	Springs/Wells/Wholesale	349	74
Washington Terrace	8,192	2,433	Well/Wholesale	1,164	127
OGDEN VALLEY					
Casey Acres	36	9	Well	2	42
Cole Canyon Water Co.	160	27	Spring	24	133
Eden Water Works Co.	1,215	292	Springs/Well	135	99
Green Hill Water & Sewer	126	35	Well	17	123
Huntsville Municipal Water Sys.	561	226	Springs	91	144
Lakeview Corp.	110	44	Well	16	132
Liberty Pipeline Co.	650	158	Spring/Well	102	140
Nordic Valley Water Co.	550	162	Wells	154	250
Pineview West Water Co.	40	13	Wells	2	54
Spring Mountain	100	30	Spring	18	158
Willow Creek Subdivision	45	9	Well	8	163
Wolf Creek County Club	478	231	Spring/Well	60	112
DAVIS COUNTY					
Bountiful	36,404	9,030	Spring/Wells/Surface/Wholesale	4,633	114
Centerville	13,310	3,000	Wells/Wholesale	1,837	123
Clearfield	13,961	6,068	Wells/Wholesale	4,754	304
Clinton	7,952	2,000	Well/Wholesale	1,693	190
Farmington	10,851	2,500	Wells/Wholesale	1,173	96
Fruit Heights	4,854	968	Springs/Well/Wholesale	491	90
Hill Air Force Base	5,148	1,814	Wells/Exchange/Wholesale	5,154	894
Kaysville	13,541	3,500	Exchange/Wholesale	1,719	113
Layton	46,758	10,882	Spring/Wells/Wholesale	8,760	167
North Salt Lake	8,667	1,303	Spring/Wells/Wholesale	2,650	273
South Davis W.I.D.	4,825	1,944	Springs/Wells/Wholesale	626	97
South Weber	3,788	781	Well/Wholesale	788	186
Sunset	5,816	1,590	Well/Wholesale	1,684	258
Syracuse	8,168	1,315	Wells/Wholesale	832	91
West Bountiful	4,588	1,090	Well/Wholesale	1,080	210
West Point	3,830	882	Wells/Wholesale	1,198	279
Woods Cross	6,182	1,369	Wells/Wholesale	1,600	231
SUMMIT COUNTY					
COALVILLE AREA					
Cluff Ward Pipeline Co.	148	52	Springs	21	128

Table 11-1 (Continued)
PUBLIC CULINARY WATER SUPPLY AND USE (1992)

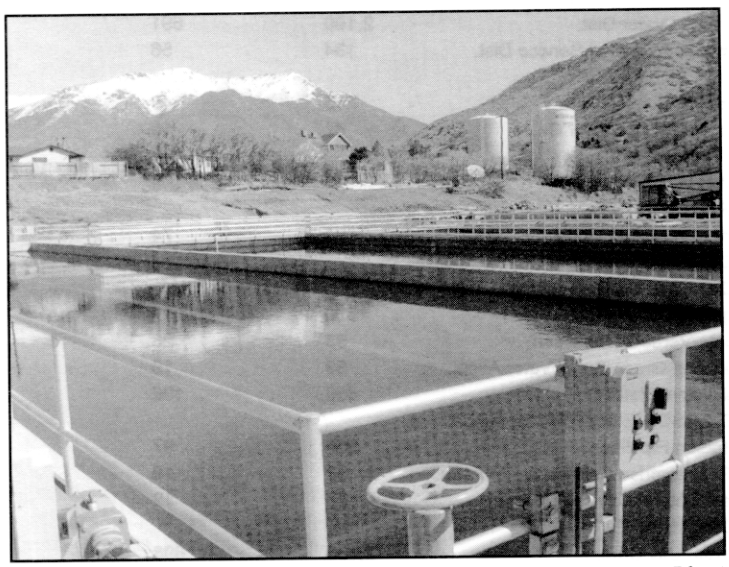
Water Supplier	Population Served	Total Connections	Source	M&I Water Use (acre-feet)	Per Capita Use (GPCD)
Coalville Culinary Water	1,065	450	Spring/Wells	309	259
Hoytsville Culinary Water	345	132	Well	73	189
Wanship Cottage Sites	28	25	Well	2	57
Questar Pipeline Co.	17	6	Wells	4	202
ECHO					
Echo Mutual Water Co.	52	32	Springs	8	135
HENEFER					
Henefer Pipeline Co.	570	205	Spring	73	114
KAMAS					
Kamas Culinary Water System	1,061	426	Spring/Wells	699	588
MARION					
Marion Waterworks Co.	350	76	Springs	63	160
OAKLEY					
Oakley Culinary Water	550	220	Springs	194	315
PARK CITY AREA					
Atkinson Special Improvement Dist.	350	86	Well	54	137
Community Water Co.	1,000	185	Surface/Wells	224	200
Gorgoza Mutual Water Co.	2,420	605	Spring/Wells	335	124
High Valley Water Co.	520	130	Spring	128	220
Park City Culinary Water	5,500	3,112	Springs/Wells/Tunnel	2,657	431
Silver Springs Water, Inc.	1,388	475	Springs	251	162
Spring Creek Water Co.	120	31	Well	14	106
Summit County Service Area #3	108	43	Well	20	167
Summit Park Special Service Dist.	1,500	368	Wells	144	86
Summit Water Dist.	2,100	691	Wells	658	280
Timberline Special Service Dist.	134	56	Wells	12	77
PEOA AREA					
Peoa Pipeline Co.	215	48	Springs	25	102
Wooden Shoe Water Co.	42	16	Spring	5	110
UPTON					
Upton Water Works	10	5	Springs	1	121
WANSHIP					
Wanship Mutual Water Co.	184	74	Springs/Well	41	198
MORGAN COUNTY					
MOUNTAIN GREEN AREA					
Highlands Water Co.	550	122	Springs/Well	58	95
Monte Verde Water Assn.	93	28	Wells	34	324
Mountain Green Sub. Water Assn.	59	19	Wells	15	233
Wilkinson Water Co.	450	136	Wells	119	236
PETERSON/ENTERPRISE AREA					
Peterson Pipeline Co.	350	97	Wells	85	217
V.P. Enterprise Estates Water Assn.	82	19	Wells	12	130
West Enterprise Water Assoc.	27	12	Wells	4	116
MORGAN AREA					
Morgan City Corp.	2,100	698	Spring/Wells	740	315
Richville Pipeline co.	100	33	Well	33	292
South Littleton Water Co.	36	12	Well	7	167
South Robinson Spring Water Users	30	12	Springs	16	485
CROYDON AREA					
Croydon Pipeline Co.	56	15	Spring/Well	13	201

Table 11-2
SUMMARY OF WATER TREATMENT PLANTS

Water Treatment Facility	Operating Agency	Location	Hydraulic Capacity (cfs)	Current Deliveries (acre-feet)
Water Treatment Plant No. 1	Ogden City Corp.	Ogden Canyon at Pineview Res.	23.2	4,700
Water Treatment Plant No. 2	Weber Basin WCD	Ogden East of Harrison Blvd-Old Post Rd.	40.0	11,300
Water Treatment Plant No. 3	Weber Basin WCD	Layton at District Headquarters	40.0	13,700
Water Treatment Plant No. 4	Weber Basin WCD	Bountiful at Davis Blvd.	10.0	4,200
Bountiful Package Plant	Bountiful City	Bountiful/Mill Creek	2.0	1,000
Park City	Park City	West Park City	2.2	1,000
Totals			117.4	35,900

with power and authority to regulate and protect the quality of all public drinking water supplies in the state. The USDWA authorized the Drinking Water Board to 1) establish standards for drinking water quality; 2) establish standards and regulations for the design and construction of new and expanded water treatment and conveyance facilities; 3) protect watersheds and other sources of raw public water supplies; 4) provide technical and financial assistance to local water provider agencies to promote clean water programs, train treatment plant and/or system operators, construct new treatment and distribution facilities to meet expanding drinking water demands, and/or renovate existing treatment and distribution facilities to improve on existing treatment processes; 5) administer federal programs that provide technical and financial assistance to local water provider agencies; 6) implement emergency plans in the event of natural disasters resulting in the contamination of public drinking water supplies; and 7) provide enforcement of state and federal drinking water regulations.

The Division of Drinking Water acts as the staff of the Drinking Water Board. In general, state drinking water regulations are consistent with comparable federal regulations. State regulations can be more stringent than federal regulations where the Board and Division of Drinking Water feel federal regulations do not adequately protect the health and well-being of the state's populace. Public drinking water systems are categorized as "community," "non-transient, non-community" and "non-community" systems. "Community" water systems are treatment and/or distribution facilities which serve a minimum of 15 connections or regularly serve 25 or more residents on a year-round basis. "Non-transient, non-community" are systems that are not community systems and that regularly serve at least 25 of the same persons over six months of the year. "Non-community" systems are not community systems or non-transient, non-community systems.



Weber Basin Water Conservancy District Plant

"Primary" maximum contaminant levels (MCLs) have been established for a number of contaminants. These primary standards are designed to establish treatment requirements to protect public health and safety. In addition, "secondary" standards exist which deal with aesthetics such as taste, odor and the staining of plumbing fixtures. "Secondary" standards are considered recommendations and not requirements.

The Division of Drinking Water takes an active role in promoting the quality and quantity of drinking water supplies. For example, the division 1) previews and approves engineering plans for drinking water systems prior to construction, 2) administers a loan program for drinking water projects, 3) conducts inspections of drinking water systems, 4) maintains a water system rating system, 5) issues administrative orders to non-complying systems, 6) issues variances and exemptions when federal rules are inappropriate, and 7) administers a source protection program to safeguard the state's drinking water sources.

11.3.3 Federal Drinking Water Programs

With the passage of the federal Safe Drinking Water Act (SDWA) in 1974, the federal government established national drinking water regulations to protect the public from water borne diseases. Congress expanded and strengthened the SDWA in 1986. Amendments to the Act (in 1986 and 1996) significantly increased the responsibility of the Environmental Protection Agency (EPA) to:

- Establish maximum levels of contamination for established pollutants;
- set compliance deadlines for owners/operators of treatment facilities that violate federal regulations;
- regulate surface water treatment associated with lead removal and wellhead disinfection;
- strengthen the enforcement of all regulations in the initial act;
- create federal funding for state revolving loans;
- expand the universe of water systems required to have certified operators;
- require public water systems to annually provide consumers a consumer confidence report;
- grant states authority to examine the financial, technical and managerial capabilities of water systems.

Chemical, physical, radiological and bacteriological substances in drinking water which pose a health risk to the public are regulated by the EPA under provisions given in the SDWA. The EPA has established an extensive list of maximum contaminant levels (MCLs) for most common organic and inorganic contaminants.

The SDWA has also established a strict schedule to determine reasonable MCLs for a number of additional contaminants. As a result, additional contaminants are identified on a regular basis by the EPA and subject to new regulations.

To control and improve the aesthetic quality of drinking water supplies, the SDWA also includes a list of secondary maximum contamination levels (SMCLs) for water aesthetics such as taste, odor and color. Although the evaluation of these qualities is subjective, the measurement of SMCLs has allowed for a reasonable level of consistency in water aesthetics determinations from one supply to another.

The SDWA also requires state and local water provider agencies to monitor a specified list of both regulated and unregulated contaminants. The selection of contaminants is dependant on the number of people served, the water supply source and contaminants likely to be found. The standardized monitoring frame work is administered over three, three-year compliance cycles for a nine-year total monitoring period beginning in 1992. The completion of the first nine-year monitoring period shall be followed by a second nine-year period.

The SDWA reauthorization has granted the EPA to change the standardized monitoring framework to cover a longer period of time. EPA and state officials will have a proposed new framework prepared in late 1997.

The 1986 amendments to the SDWA require all states to develop wellhead protection programs. The Division of Drinking Water has created the Drinking Water Source Protection Rule (DWSPR) outlining the general requirements to protect wellheads from outside surface contamination. Requirements of the DWSPR include the preparation of a Drinking Water Source Protection Plan for each groundwater source and providing proof of ownership and maintenance of all land in and around wellheads where surface water contamination may occur.

The 1996 amendments to the Safe Drinking Water Act provided more than $12 billion of federal funds to implement a number of new drinking water programs for the fiscal years of 1997 through 2003. The Division of Drinking Water expects to receive about $ 12.5 million annually from these federal funds.

New capacity development provisions are added to the Act. The EPA must complete a review of existing state capacity development efforts and publish information to assist states and public water suppliers.

11.4 Drinking Water Problems

Water-related problems in the Weber River Basin are generally associated with the contamination of both surface and groundwater supplies because of poor watershed planning/management, growing urbanization, leaking underground storage tanks, and poor management of hazardous waste land fills.

11.4.1 Surface Water

Water quality in the upper Weber River is generally considered good to excellent. However, problems exist in isolated reaches of drainages of the upper Weber and Ogden rivers. The rapid urbanization of the Snyderville Basin and Park City Area has, in turn, increased the rate of secondary wastewater effluent discharged to both East Canyon and Silver Creek drainages. In recent years, this increase in effluent discharge has resulted in additional nutrient loadings to East Canyon Reservoir and, to a lesser degree, the lower Weber River system.

The Summit Water Distribution Company has proposed the construction of a surface water treatment facility on East Canyon Creek immediately upstream of an existing wastewater treatment facility. The wastewater treatment plant owned and operated by the Snyderville Basin Sewer Improvement District is currently discharging treated effluent to East Canyon Creek within existing federal NPDES permit regulations. But construction of the water treatment plant would effectively reduce flow in East Canyon Creek and increase the concentration of regulated contaminants currently discharged from the wastewater treatment plant. Both agencies are currently in litigation to resolve the issue.

In recent years, the Weber River Basin Water Conservancy District has experienced excessive organic loadings to their Layton and Ogden water treatment facilities from the upper Weber River. The problem is created by seasonal fluctuations in the natural river channel that allows cycles of algae growth and deterioration. As a result, the treatment plant at Layton is subject to considerable levels of seasonal organic loading resulting in the periodic plugging of standard filtration treatment processes.

Water quality in the upper Ogden River is currently rated as good to excellent. However, the recent rate of urban growth in Ogden Valley threatens to contaminate groundwater aquifers that feed the reservoir and Ogden City's culinary water treatment plant.

A recently completed *EPA 314 Clean Lakes Study* determined current water quality in Pineview Reservoir conforms with state and federal regulations for culinary and recreational uses. Although there is not a current threat to public safety, continued use of septic tanks in lieu of sanitary sewers may ultimately degrade water quality in the reservoir to levels violating state and federal drinking water standards.

11.4.2 Groundwater

Six basic groundwater areas are within the basin, including the East Shore Area, Central Weber Valley, Park City, Rhodes Valley, Weber Valley above Oakley and Ogden Valley. Water quality in these aquifers varies depending on location. In general, the groundwater quality in the upper Weber and Ogden rivers drainages is good to excellent. Groundwater quality in the lower basin declines as groundwater flows to the Great Salt Lake due to salt and mineral contamination. A detailed discussion of groundwater characteristics, including water quality, is given in Section 19 Groundwater.

The long-established practice of dumping hazardous waste into open trenches and pits at Hill Air Force Base has contaminated groundwater within and outside existing base boundaries. Base officials have addressed the problem in a number of reports and studies that have determined the extent of contamination in terms of water quality and the geographic spread of contaminated groundwater plumes. These reports and studies have also identified a number of remedial actions to effectively confine the further spread of contaminated plumes and treat existing portions of localized contaminated aquifers.

Culinary water in the Ogden Valley is derived entirely from local groundwater aquifers. Well pumpage and spring diversions in 1992 account for an estimated 630 acre-feet of annual diversions for culinary water. Although not as pronounced as in the Snyderville Basin and Park City Area, the Ogden Valley is currently experiencing a moderate 2 percent growth rate that may approach the 4 percent rate currently estimated for southwestern Summit County.

Annual groundwater diversions are made primarily from the existing shallow aquifers up gradient from Pineview Reservoir. As the demand for culinary water increases, the number of wells and spring diversions will also increase. A relatively high percentage of existing wells are privately owned and operated. These wells are not monitored by local health agencies and may be subject to contamination by surrounding septic tanks and drain fields as the number of residential developments increase. The Weber County Health District needs to

actively educate the owners and operators of these private wells and spring diversions regarding the need and procedures for monitoring water quality.

To address the growing demand for culinary water, Weber County, with assistance from the Division of Drinking Water, and local water districts and companies has begun the process of preparing the Ogden Valley Water Management Plan. The plan will attempt to quantify the short and long-term demand for culinary water. The hydraulic limitations of the existing aquifer must be assessed to determine when and if the development of supplemental surface water sources is needed. The assessment of the existing aquifer should also include the impact on groundwater quality by the continued use of septic tanks and drain fields to dispose of domestic wastewater.

11.5 Culinary Water Use and Projected Demand

The Weber River Basin has an overall population growth rate estimated at approximately 2.1 percent. Summit County is expected to grow at a rate of nearly 4.0 percent, and Davis, Weber and Morgan counties are expected to grow at 2.1, 1.9 and 2.0 percentages respectively. The demand for drinking water is also expected to grow in roughly the same proportion as the population growth rate. The projection of drinking water demand for major water suppliers is summarized in Table 11-3.

11.6 Alternative Solutions

Local, state and federal agencies are actively engaged in a number of studies to identify feasible and practical solutions to the various drinking water problems previously mentioned. The most prominent of these problems include the continued contamination of surface water sources by organic and domestic wastes within the upper Weber and Ogden River drainages, the steady decline in groundwater levels within highly populated areas of the basin, and the potential spread of contaminated groundwater from the Hill Air Force Base area.

The Weber Basin Water Conservancy District has, in recent years, modified the filtration process at its Layton and Ogden water treatment plants to more effectively remove suspended organic contaminants generated from upper Weber River flows. To solve the long-term problem, the district has developed a watershed management practices plan to minimize the generation of organic loads in the upper Weber River system.

In recent years, the Weber Basin Water Quality Management Council, in cooperation with the Bureau of Reclamation and the Utah State Water Research Laboratory, has developed a river management model to help determine criteria to operate the entire river system. The model's objective is to determine the impact of differing river operational schemes and projected organic loads on existing treatment facilities.

The Division of Water Rights has recently completed a management plan for the East Shore Area Groundwater Aquifer (ES-GWA) in two basic areas: the Weber Delta and the Bountiful Subareas. Although the ES-GWA is extremely large in terms of gross water storage, pumping activities within the aquifer have reached levels resulting in excessive decreases in groundwater elevations in the northern to central portions of the overall groundwater basin. To address the issue, the Division of Water Rights and the U.S. Geological Survey (USGS) have created and executed a computer model of the overall aquifer system (including both groundwater subareas) to predict future groundwater level changes for a number of pumping and aquifer management scenarios.

Based on the aquifer's hydraulic characteristics and a continuation of historic pumping rates, the model has predicted significant declines in groundwater levels. Although this scenario will not pose a problem in regard to aquifer storage capacities, the projected decline in groundwater levels will create additional pumping lifts and may dry up some local wetlands and other water-related ecosystems.

To control, or better manage, the possible decline of groundwater levels in these areas, the completed groundwater management plan for the East Shore Area includes two objectives. One is to establish a policy for all new water appropriations and change applications for existing water rights. The other is to protect existing groundwater resources from over-utilization. A copy of the plan can be obtained from the Division of Water Rights in its Salt Lake City offices.

Within the Snyderville Basin and Park City Area, the Division of Water Rights, in cooperation with the U.S. Geological Survey and Utah Geological Survey, has begun a groundwater study with the objective of determining the impact on groundwater levels and storage created by increased pumping. The study was initiated as a response to the growing need for M&I water sources within the Snyderville Basin. The study is in its early stages with basic geologic and hydrological data being collected.

11.7 Issues and Recommendations

Drinking water issues within the Weber River Basin generally revolve around water quality and the contamination of existing streams, reservoirs and groundwater aquifers by domestic wastewater effluent and poor land use practices. These issues, although important to drinking water supplies, are discussed in other sections. Water quality issues dealing directly with streams and reservoirs are discussed in Section 12, Water Quality, while groundwater quality issues are discussed in Section 19, Groundwater. ❖

Table 11-3
CURRENT AND PROJECTED CULINARY WATER DEMAND FOR MAJOR WATER SUPPLIERS

Water Supplier	1992 M&I Use (Acre-feet)	2020 M&I Use (Acre-feet)
WEBER COUNTY		
Bona Vista W.I.D.	3,040	4,200
Hooper W.I.D.	1,600	4,400
North Ogden	1,570	2,400
Ogden	18,430	1,990
Pleasant View	840	1,300
Riverdale	2,560	4,700
Roy	3,140	4,400
South Ogden	1,620	2,800
Taylor West Weber	2,530	7,700
Uintah	300	500
Uintah Highland	350	600
Washington Terrace	1,160	1,300
Ogden Valley Suppliers	630	2,800
WEBER COUNTY TOTAL	**37,770**	**54,460**
DAVIS COUNTY		
Bountiful	4,630	5,400
Centerville	1,840	3,300
Clearfield	4,750	8,000
Clinton	1,690	4,400
Farmington	1,170	2,900
Fruit Heights	490	1,500
Hill Air Force Base	5,150	5,150
Kaysville	1,720	3,000
Layton	8,760	13,200
North Salt Lake	2,650	4,300
South Davis W.I.D.	530	900
South Weber	790	1,500
Sunset	1,680	2,100
Syracuse	830	1,200
West Bountiful	1,080	1,700
West Point	1,200	1,900
Woods Cross	1,600	2,600
DAVIS COUNTY TOTAL	**40,560**	**60,050**
SUMMIT COUNTY		
Coalville Culinary Water	310	770
Kamas Culinary Water System	700	1,780
Park City Culinary Water	2,660	7,230
Summit Water District	660	2,760
Other Summit County Supplies	1,690	2,360
SUMMIT COUNTY TOTAL	**6,020**	**14,900**
MORGAN COUNTY		
Morgan City Corp.	740	930
Other Morgan County Suppliers	400	1,970
MORGAN COUNTY TOTAL	**1,140**	**2,900**
WEBER BASIN TOTAL	**85,490**	**132,310**