Section 6 Management

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6 Management

Management of the Kanab Creek/Virgin River Basin water resources is one of the primary concerns of the local water providers and users. This is particularly true because the area is subject to frequent periods of drought. The increasing demand for water further complicates the situation.

6.1 Introduction

This section describes the management of water resources in the basin. Many entities have rights to use and regulate the available water. Demands for water are changing. As new users compete for water, conflicts may arise.

6.2 Setting

The Paiute Indians developed the first water in the area to irrigate crops along the Santa Clara River. Another band of Indians, the Kaibabits, also cultivated crops in the Kanab Creek and Johnson Wash areas.

The first white settlers diverted water in 1855 to raise crops. Continued attempts to establish and maintain irrigation were plagued by floods and other problems.

Since these early efforts, more permanent structures have been installed to develop the water resources for the benefit of the local water users. These include diversion structures, storage reservoirs and delivery systems for irrigation. Systems have also been developed to supply water for domestic, municipal and industrial use. The available water supply is now administered according to state water law by the various entities with rights to use and distribute this resource. These entities include mutual irrigation companies, municipalities, water conservancy districts and individuals.

6.3 Policy Issues and Recommendations

Two policy issues discussed to help improve the management of water resources are a Virgin River minimum flow requirement and water storage reservoirs.

6.3.1 Virgin River Flow Requirements

Issue - Instream flow requirements below La Verkin Springs for protection of the endangered woundfin minnow and Virgin River roundtail chub are competing with future water development alternatives and increasing management problems. Requirements for instream flow need to be resolved.

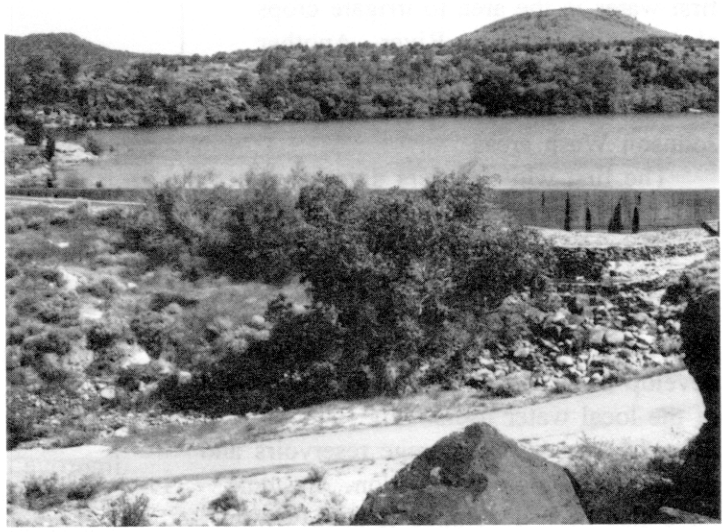
Discussion - There are reaches below diversions in the Virgin River where instream flows are not required. The only current instream flow requirement in the Virgin River is tied to the construction and operation of Quail Creek Reservoir. This requirement states the lessor of either 86 cfs or the natural flow must be in the river below Quail Creek Reservoir down to the St. George and Washington Canal diversion during all months of the year. This is one of the requirements set forth by the U.S. Fish and Wildlife Service (USFWS) to protect the endangered woundfin minnow when the Quail Creek Project was built until studies were made to determine the minimum flow. The 86 cfs was based on the water right at the St. George and Washington Canal Company diversion below Quail Creek Reservoir, not on a minimum flow determination.

Experts disagree about flows required for the protection of the woundfin minnow. Over the years, minimum required flow recommendations have ranged from 30 to 110 cfs. A recent five-year study sponsored by the Washington County Water Conservancy District suggests a minimum of 50 cfs during the winter months and 86 cfs during the irrigation season will adequately protect the woundfin minnow. Additional data may be needed to make a final determination.

Recommendation - The Washington County Water Conservancy District, in conjunction with the Utah Department of Natural Resources and the U. S. Department of Interior, should initiate negotiations or additional studies to resolve the quantity of flow required to allow recovery of the endangered fish.

6.3.2 Storage Reservoirs for Management

Issue - Surface water storage reservoirs can provide dependable water supplies for use during the time of need. Reservoirs can also reduce peak flood flows and trap sediment. Some people maintain that flooding and low flows are needed to preserve the pristine habitat.



Discussion - Water storage is needed to meet the increasing municipal and industrial demands of a fast-growing population. Winter flows and snowmelt runoff can be captured and saved for use when natural streamflows are inadequate to supply all the needs. Instream flows can be enhanced in designated river sections by timing the release from reservoirs to meet consumptive and non-consumptive needs. Riparian vegetation can be improved by preventing destruction from high flood flows. Even with some reservoir construction, flood flows will still carry sediment. This will maintain a semblance of historic flow regimes and still provide development opportunities to meet future demands.

Recommendation - Several potential storage reservoir sites are located on the tributary streams of the Virgin River and on Kanab Creek and Johnson Wash. The Division of Water Resources should continue to assist local entities in their investigation to identify water storage projects that are feasible.

6.4 Irrigation Systems

Incorporated mutual irrigation companies serve the majority of the irrigated land in the basin. Private irrigation systems serve about one-third of the irrigated area. Thirty-three irrigation companies are in the Virgin River drainage and two in the Kanab Creek drainage. These irrigation companies and systems are responsible for managing nearly 70 percent of the total water supply. Table 6-1 lists these irrigation companies and the areas they serve.

6.5 Municipal and Industrial Systems

The basin has 78 drinking water systems. Thirty-five are classified as "Public Community" suppliers. All of the systems use groundwater as their sole supply source, except Virgin, St. George and Springdale. These three cities treat surface water as well as use groundwater from springs and wells. The major public water suppliers are listed in Table 5-8 along with the per capita day use.

Some light industries use minor amounts of water that are delivered through the public water supply systems. Heavy industries have not been established in the basin. There are, however, two mining operations; one is located in the Beaver Dam Wash drainage and the other is in the Santa Clara River drainage. These operations use self-supplied water (See Section 18).

Water used for municipal and industrial purposes is usually well-managed. Most of the public water suppliers continue to upgrade their systems and strive to maintain an approved rating from the Department of Environmental Quality.

6.6 Problems and Needs

One of the biggest problems is delivering the water needed to the right place at the right time. Another problem is providing water for all needs and uses.

In order to properly manage the water supplies for various uses, facilities need to be maintained or replaced. This can also improve water use efficiencies. Concrete structures deteriorate with time and eventually need to be replaced. Reservoirs fill with sediment, reducing conservation pools and active storage capacity. Eventually, replacement capacity may be

TABLE 6-1
IRRIGATION COMPANIES[1]

Central Virgin River	Acres Served
Bench Lake	1,100
High Line Ditch	60
Hurricane Canal	1,220
Kanarraville	990
La Verkin Bench and Canal	270
Lee - Spendlove	110
Leeds Water Company	280
New Harmony Reservoir and Irrigation	90
Pintura	120
South Fields	30
St. George and Washington Canal	3,410
St. George and Washington Canal & Wells	360
St. George Valley	330
Tanner Ditch	130
Toquerville	260
Virgin Canal	120
Virgin	80
Total	8,960
East Fork Virgin River	
Glendale	400
Mt. Carmel	380
Orderville	240
Muddy	170
Total	1,190

TABLE 6-1 (continued)
IRRIGATION COMPANIES

North Fork Virgin River	Acres Served
Hall-Grafton	170
Rockville	60
Springdale	120
Total	350
Santa Clara River	
Bloomington Canal	200
Central Canal and Irrigation	620
Gunlock	190
Ivins	560
New Santa Clara Fields	330
Pine Valley	590
St. George - Clara Fields Canal, Seep Ditch	690
Town Ditch	50
Veyo	400
Total	3,630
Kanab Creek	
Alton Farmers Association	580
Kanab	1,500
Total	2,080
Private Irrigation Systems	9,390
Total	25,600

needed. Dredging existing reservoirs is expensive and can be environmentally offensive. New reservoirs may be required.

6.6.1 Irrigation Companies

Irrigation companies have experienced many problems over the years with diversion facilities and delivery systems. From the days of early settlement, floods have been a particular problem, often washing out diversion structures two or three times a year. Canals and ditches still wash out occasionally. In some smaller systems, seepage rates may reduce deliveries to less than half of the water diverted. Delivery system efficiencies for selected systems are shown in Table 6-2.

Considerable improvement has been made over the years in delivery systems and onfarm application, but additional work is needed to improve water use. This is especially true as increased demands for water accelerate. Most of the irrigation companies shown in Table 6-2 with a delivery efficiency over 90 percent have an improved system such as a lined-canal or pipeline. Remaining systems need to be upgraded where it is economically and technically feasible.

Most of the major irrigation company diversion structures are in good condition. Some need better maintenance to avoid more costly repairs or replacement later. Some structures could be improved with minor construction or renovation.

In general, irrigation water needs exceed the supply. In areas where agricultural land is converted to residential development, the irrigation water could become available for other uses.

Even if considerable progress is made toward improving irrigation systems, there will not be enough water to meet the agriculture needs. This accents the need for wise management and conservation of water used by the agricultural industry.

Improved onfarm water application efficiencies are needed in some areas. Improvements could reduce required diversions or reduce late season shortages. Much has been done to increase onfarm efficiencies of water use, including implementing best management practices. Refer to Section 17.2 for additional water savings information.

6.6.2 Municipal and Industrial Water Concerns

Two concerns regarding municipal and industrial water are water quantity and water quality. Most public water suppliers have adequate quantities of water to meet current needs, except during extended periods of extreme drought. Suppliers using groundwater from wells generally have good quality water.

Municipal and industrial water for future demands could be developed by using surface water flows or groundwater. Developing additional wells could increase the use of groundwater in some areas, particularly where the Navajo sandstone aquifer exists at feasible depths. Monitoring of groundwater storage would be imperative to prevent mining or infringement on other rights. Additional surface water could be developed or converted from agricultural uses and treated in conventional water treatment plants. Protection of aquifer recharge zones and conservation and wise water use would also be beneficial to maintain quality and stretch existing supplies.

TABLE 6-2 IRRIGATION DELIVERY EFFICIENCIES[1]	
Irrigation Companies	Efficiency (percent)
Bench Lake Canal	70
Hurricane Canal	70
St. George and Washington Canal	70
La Verkin Bench Canal	97
Virgin	88
Glendale	90
Mt. Carmel	50
Orderville	75
Bloomington	90
Central Canal	96
Gunlock	96
Ivins	94
New Santa Clara Fields	75
Pine Valley Irrigation	85
St. George/Clara Fields	95
Veyo Irrigation	96
Kanab	80

6.7 Colorado River Salinity Control Program

Congress enacted the Colorado River Basin Salinity Control Act in 1974, (Public Law 93-320). This act directed the Secretary of the Interior to enhance and protect the quality of water available in the Colorado River system for use in the U.S. and the Republic of Mexico. Public Law 96-375 further authorized the Bureau of Reclamation to conduct a feasibility study of the Lower Virgin River unit. Later amendments to the act (Public Law 98-569) gave the Secretary of Agriculture the authority to identify other areas with salt loading resulting from irrigation and watershed practices, and to develop and implement practices to reduce salt loading.

The planning report on the La Verkin Springs salinity control unit (authorized by the 1974 act) was completed in December 1981. Although a salinity control project based on membrane desalting and solar evaporation ponds was technically and environmentally feasible, the Bureau of Reclamation concluded efforts to remove salt contributed by La Verkin Springs would not be cost effective, and might well be negated by the hydrogeology of Virgin River canyon. Alternative methods of brine disposal were examined later and determined to be economically infeasible.

Studies for the Allen-Warner Valley Energy System were carried out to determine the feasibility of using water in the Kanab Creek drainage to slurry coal in a pipeline from the Alton coal fields to southern Utah and Nevada. Studies were terminated because of uncertainties associated with scheduling construction of a proposed power plant near Las Vegas. The Bureau of Reclamation is presently working with the Las Vegas Valley Water District on a feasibility study of a 70,000 acre-foot joint salinity control/water supply project on the lower Virgin River. The study is scheduled for completion in 1995.

The U.S. Department of Agriculture has investigated the potential for agricultural-related salinity control in the lower Virgin River Basin. The department released a draft environmental impact statement in July 1992 on the Moapa Valley Unit in Nevada. Preliminary estimates indicate good cost-effectiveness. ■

6.8 References

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2. Utah Division of Water Resources. *Hydrologic Inventory of the Virgin and Kanab Study Units*. Salt Lake City, Utah, 1983.

3. Utah Division of Water Rights. *Water Companies in Utah*. Salt Lake City, Utah, 1990.

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