

# **WRID, Lyon County and Bowman Protestants**

## **EXHIBIT**

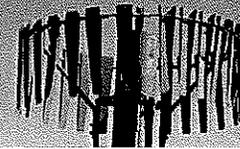
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Excerpt from Walker River Chronology, Nevada Division of Water Resources

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## WALKER RIVER CHRONOLOGY

### A Chronological History of the Walker River and Related Water Issues

The following information in **Part I--Overview** of this *Walker River Chronology* contains general background information and a description of the Walker River Basin and its physical, geologic, and hydrologic characteristics. **Part II--Pre-Twentieth Century** and **Part III--Twentieth Century** contain a detailed chronological listing of some of the more important events associated with the Walker River Basin, the Walker River, the East and West Walker rivers, storage reservoirs, Walker Lake, and related water supply, water use, water rights, and water quality issues.

#### Part I--Overview

##### Introduction

The Walker River Basin encompasses an area of approximately 4,050 square miles (2,591,990 acres)<sup>(1)</sup> and stretches in a generally northeasterly direction from the origins of its waters in the higher elevations of the Sierra Nevada Mountains in the southwest, beginning just north of Mono Lake, to the basin's terminus, Walker Lake, located on the basin's eastern edge. Between the headwaters of the Walker River, located in Mono County, California, and Walker Lake, located in Mineral County, Nevada, the Walker River Basin includes the southern portion of Douglas County, a large portion of Lyon County, and a very small portion of Churchill County, all Nevada counties. [See **Table 1, Nevada Hydrographic Areas in the Walker River Basin**, for a description of the hydrographic areas and sub-areas contained in the Nevada portion of the Walker River Basin.]

As is typical in other hydrographic basins in western Nevada, such as the Truckee and Carson River basins to the north, there exists a considerable imbalance in the Walker River Basin's sources of water and uses of water. While only approximately 25 percent of the Walker River Basin lies within California (approximately 1,002 square miles, or 641,280 acres), this portion of the basin accounts for the vast majority of the precipitation and constitutes the primary source of the basin's surface water flows. Meanwhile, the vast majority of consumptive water use within the basin, including irrigation, evapotranspiration, and evaporation from surface waters, particularly at Walker Lake, takes place within Nevada. The basin's principal agricultural water use occurs in Bridgeport and Antelope valleys in Mono County, California,<sup>(2)</sup> and the Smith and Mason valleys located in Lyon County, Nevada. According to one estimate, in 1969 water withdrawals for irrigation in the Nevada portion of the basin alone accounted for more than 90 percent of this portion of the basin's total consumptive water use (excluding evaporation, seepage, and phreatophyte use).<sup>(3)</sup> While admittedly dated, this figure still depicts the relative importance of agricultural water use in the Walker River Basin.

The Walker River Basin is bordered on the southwest by the Sierra Nevada Mountains, on the west by the Pine Nut Mountains, on the north by the Desert Mountains, on the east by Gabbs Valley and Gillis Mountain ranges, and on the southeast by the Excelsior Mountains. The East and West forks of the Walker River system are separated by the Sweetwater Mountain Range and the Pine Grove Hills. The East Walker River is separated from Walker Lake to the east by the Wassuk Range, which is dominated by Mount Grant and rises over 7,000 feet above the surface of Walker Lake. Within the basin, valley floor elevations range from approximately 4,000-7,000 feet, with mountain ranges rising from 2,000-5,000 feet above the adjacent valleys. The highest peak in the Nevada portion of the basin is Mount Grant (11,239 feet), located in the central part of the Wassuk Range, near the south end of Walker Lake. The highest peak in the California portion of the Walker River Basin is the Matterhorn Peak (12,264 feet), located in the Sierra Nevada Mountains between Robinson and Green creeks, tributaries to the East Walker River. **Table 1, Nevada Hydrographic Areas in the Walker River Basin**, presents a listing of the hydrographic areas and sub-areas contained within the Nevada portion of the Walker River Basin. This basin is designated as Nevada Hydrographic Region [or Basin] 9, one of 14 defined hydrographic basins located within the State of Nevada.<sup>(4)</sup>

Table 1--Nevada Hydrographic Areas in the Walker River Basin **Hydrographic Areas and Sub-Areas by County, Surface Area, and Area Number**

Hydrographic Area/Sub-Area <sup>1</sup> [Nearest Cities]	County(ies)	Surface Area <sup>1</sup> (acres)	Surface Area <sup>1</sup> (sq. mi.)	Nevada Area Number
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#### Subsections

- Credits, Notes, and Acknowledgements
- Introduction
- Part I – Overview
- Part II – Chronology: Pre-Twentieth Century
- Part III – Chronology: Twentieth Century
- Part IV – References
- Walker River Flow Schematic

#### Other Chronologies

- Carson River
- Truckee River
- Walker River
- Humboldt River

**Table 6, Walker River Basin Selected Gaging Station Flow Rates**, presents Walker River Basin stream flow measures for selected gaging stations for an "Average Water Year," a "Low Water Year," and a "High Water Year." [See table note with respect to breaks in the period of record for these gaging stations as noted in Table 5, presented previously.]

### Walker River Basin Issues

Similar to many other hydrographic basins in arid regions of the West, the Walker River Basin faces a number of crucial water-related issues pertaining to both growing and evolving demands for finite water resources. Such issues along the Walker River system center primarily on the full appropriation of surface water resources within the basin, extensive groundwater pumping to augment surface water diversions during low-water years, resultant lowered water tables from groundwater pumping, reduced flows along the river's lower reach and particularly into Walker Lake, concurrent river and lake water quality issues, and conflicting water demands for varied uses. The most prominent of these issues are described below.

[1] ***Decline in Walker Lake's Level, Volume, and Water Quality***--Since initial readings were taken in 1882,<sup>(49)</sup> Walker Lake's surface elevation has declined by over 134 feet from 4,080 feet above mean sea level (MSL) recorded by Russell in 1882 (resulting in a lake depth of 224 feet) to a more recent peak surface elevation of 3,945.9 feet MSL (resulting in a lake depth of only 90 feet) recorded by the USGS on August 3, 1995.<sup>(50)</sup> This change in surface elevation reflects a dramatic change in Walker Lake's total volume, declining from an estimated nine million acre-feet in 1882 to just over two million acre-feet presently. The deterioration of Walker Lake's water quality has followed closely the decline in surface water levels and lake volume. Because Walker Lake is a terminal lake, there exists a natural build-up of total dissolved solids (TDS), particularly salts. As a result of the decline in Walker Lake's surface elevation, and an even more pronounced decline in its volume,<sup>(51)</sup> the TDS concentrations have increased dramatically. In addition, reduced lake volumes have also increased water temperatures and lowered the lake's levels of dissolved oxygen, severely stressing the lake's wildlife and seriously jeopardizing its viability as a fishery. Initial recordings taken in 1882 by Russell reported Walker Lake's TDS concentrations at approximately 2,560 milligrams per liter (mg/l), whereas more recent readings show TDS concentrations of approximately 13,000 mg/l at the present time (1996). Studies have shown that TDS concentrations approaching 16,000 mg/l will cause a 100 percent mortality rate on the lake's Lahontan cutthroat trout population.<sup>(52)</sup> The trout population in this lake is already totally dependent on restocking from hatchery stock; there is no natural reproduction of trout within Walker Lake or in the lower reach of the Walker River.

[2] ***Preservation of a Viable Agricultural Industry***--Agriculture (including farming and ranching) represents a primary industry sector in Lyon County and particularly in its Smith and Mason valley agricultural areas. In 1992, for example, cash receipts from farm marketings in Lyon County totaled \$65.817 million and comprised almost 22 percent of the State of Nevada's total cash receipts from farm marketings, making Lyon County the most important agricultural-producing county in the state.<sup>(53)</sup> In addition, incomes from farming in Lyon County totaled \$23.812 million in 1992, and comprised 34.7 percent of the Nevada's total farming-related incomes and 12.9 percent of the total amount of personal income of \$184.671 million earned within the county during that year.<sup>(54)</sup> And finally, farm-related employment in Lyon County in 1992 totaled 566 workers, or 7.5 percent of the county's total employment.<sup>(55)</sup> Even so, this figure tends to understate total jobs in agriculture as it does not include farm proprietorships. Lyon County has nearly 350 farming units. Agricultural water rights date back to the late-1800s when settlement in these valleys was encouraged by the federal government's various Homestead Acts (beginning in 1862), the Desert Land Entry Act (1877), and the 1894 Carey Act. Increased demands on finite and frequently unreliable Walker River flows have forced agricultural interests to begin extensive groundwater pumping operations as a backup to limited surface water supplies. This has increased the cost of farm production and dramatically lowered groundwater levels in certain areas. In addition, any dramatic shift in the uses of water resources in this basin (e.g., increased Indian water rights for the Walker River Indian Reservation, increased flows to Walker Lake, greater instream flows for fish and wildlife, etc.) are destined to have far-reaching socioeconomic impacts within the basin, principally in the agricultural areas of Bridgeport, Antelope, Smith and Mason valleys, as well as dramatically alter a way of life that has existed for generations.

[3] ***Walker River Paiute Indian Reservation Water Claims***--In 1906, after considerable pressure from state and federal officials, and particularly mining interests, the Walker River Paiute Indian Tribe ceded back to the federal government 268,000 acres of their original 318,810 acres (granted in 1864) of reservation land, including all their rights to the land surrounding and underlying Walker Lake. Subsequently, various land grants<sup>(56)</sup> were made to the Tribe from public domain lands, restoring much of the area previously ceded. Even so, the lands granted to the tribe did not include any portion of Walker Lake or any lands adjoining Walker Lake. Based upon these subsequent land grants, the Tribe is now pursuing a study, based on the reservation (Winters) doctrine, to determine the practicably irrigable acreage (PIA) within the land grants so that new Indian water rights may be assessed and, possibly, additional water rights sought. Any subsequent change in the allocation of existing waters to the Tribe, which now has the most senior priority on the Walker River system, is destined to further diminish upstream uses and particularly the water rights of existing agricultural water users in Smith and Mason valleys. The Walker Lake Paiute Indian Tribe recently filed a lawsuit for a Motion to Intervene with the intent to open Decree C-125, which represents the current adjudication of Walker Basin water rights, to reassess water rights for the reservation. In addition, water rights for storage in Weber Reservoir, constructed in 1934 and located on the reservation, have never been established. Such rights were included in the California-Nevada Interstate Compact, which was signed by California in September 1970 and by Nevada in March 1971; however, this compact was never ratified by Congress.

[4] ***Recreational Water Use***--Increasingly, the importance of the recreational and environmental aspects of the waters within this basin is becoming evident. In the summer of 1988, after a particularly dry year, with only 40 percent of normal snow water content in the upper basin, and at the request of desperate downstream farmers for additional irrigation waters, WRID drained Bridgeport Reservoir on the East Walker River. This action flushed warm, silt-laden waters into the river below the dam and led to a massive fish kill. Subsequent litigation, still not fully resolved, has dramatized the interrelationships of various users along this river system and the growing importance of environmental and recreational considerations in water use and allocation. The importance of recreational use of Walker Lake, Topaz Lake, Bridgeport Reservoir, and other lakes and reservoirs in the upper reaches of the Walker River system, is currently being studied by the University of Nevada, Reno, Department of Applied Economics and Statistics. It is hoped that through such studies the costs, benefits, and trade-offs may be better quantified as to the alternative uses of the Walker River system's limited water resources.

[5] *Interstate Water Allocation*--In September 1970, the California Legislature ratified the California-Nevada Interstate Compact, which was subsequently ratified by the Nevada Legislature in March 1971. This compact was intended to: (a) provide for the equitable apportionment of water between the two states; (b) promote interstate harmony and to further intergovernmental cooperation; (c) protect and enhance existing economies; (d) remove causes of present and future controversies over shared (interstate) waters; and (e) permit the orderly integrated and comprehensive development, use, conservation and control of the waters within the Lake Tahoe, Truckee River, Carson River, and Walker River Basins.<sup>(57)</sup> However, this compact has never received Congressional approval. Consequently, since 1971, Nevada and California have been living under the terms of individual state legislation pertaining to the shared use of the waters of the Walker River system.<sup>(58)</sup> Whether or not this compact, or a new one, is ever ratified by Congress, and in what form, will affect the primary distribution of the waters in the Walker River Basin. The uncertainty with respect to a binding law on the interstate allocation of the waters of the Walker River tends to foreshadow the ultimate resolution of other important water issues within this basin. While many of the provisions of this interstate compact with respect to Lake Tahoe and the Truckee and Carson rivers have been incorporated into the 1990 Negotiated Settlement Act (Public Law 101-618), any reference to the interstate apportionment of the waters of the Walker River was omitted. This only further clouds the eventual settlement of apportioned waters between California and Nevada within the Walker River Basin.

### **Agriculture and the Economic Foundations of Lyon County**

Controversy will no doubt continue to surround the Walker River's waters used for irrigation in Bridgeport, Antelope, Smith, and Mason valleys, and the subsequent effects these diversions from the Walker River system are having on the lower Walker River Basin, particularly with respect to maintaining Walker Lake as a viable fishery. Even so, few could deny the extensive and pervasive economic benefits that this industry has provided to the Lyon County economy in Smith and Mason valleys since the mid-1800s. In terms of economic importance, farm marketings from the sale of the Lyon County's agricultural products provide revenues of between \$40-50 million per year, making it the most important agricultural-producing county in the State of Nevada.<sup>(59)</sup> Furthermore, due to the typical export nature of many of these sales from Nevada's farms, a significant portion of the revenues from Lyon County's farm marketings provide a healthy infusion of new capital and local spending for the county's local economy.<sup>(60)</sup>

Correlation analysis studies undertaken by the Nevada Division of Water Planning<sup>(61)</sup> of a typical agricultural-based economy in Nevada have shown relatively high degrees of "insulation" for such economies from external economic influences, thereby attesting to the profound and pervasive stabilizing influences afforded by a county's farming sector. While Lyon County's total population comprises only about 1.7 percent of Nevada's total population, and the population of Smith and Mason valleys is only 0.8 percent of the state's total population,<sup>(62)</sup> Lyon County's nearly 350 farms account for approximately 12 percent of all farming units in the State of Nevada. Also, while containing only 1.8 percent of the state's total land area and 2.1 percent of its total land in farms, Lyon County's over 90,000 acres of irrigated farmland accounts for approximately 12 percent of all irrigated farmland in the state. More importantly, Lyon County's 12 percent share of the state's total irrigated farmland produces a disproportionate 18.3 percent of the state's total farm marketings, attesting to the high agricultural productivity of this region and its inherent suitability for agricultural pursuits.<sup>(63)</sup>

While agriculture remains the dominant industry in the Smith and Mason valley portion of Lyon County, there is now a shifting of the county's population away from these valleys. In 1995, only about 45 percent of Lyon County's total population actually resided in the agriculture-producing areas of Smith and Mason valleys. In fact, an increasing majority of Lyon County's new population growth is taking place outside the Walker River Basin altogether, specifically in the Carson River Basin to the north. Since the late 1980s, the communities of Fernley and Dayton have evidenced significant growth as "bedroom communities" for the Truckee Meadows (the Reno-Sparks Metropolitan Area) and Carson City, respectively. These shifting demographic patterns will, no doubt, force county planners to increasingly concentrate resources on these new, generally non-agricultural centers of growth.

Throughout this century, farming, ranching, and agriculture have been an integral part of the Lyon County economy and a fundamental way of life for the residents of Smith and Mason valleys. It has been the crucial importance of this industry, as well as the rural lifestyle it has fostered, that has made issues pertaining to the protection of existing water rights and the maintenance of a healthy agricultural sector, so sensitive to the local population in these areas.

To some degree, this area has become the victim of vastly changing federal priorities. In the late 1800s and early 1900s, federal homestead and land grant acts were passed to encourage western settlement. In the arid western states, such actions met with limited success except in those areas where water was readily available and the farmers and ranchers developed the storage and irrigation systems necessary to bring life to the desert, thereby increasing the economic productivity and social benefits of the resources of these areas. In the Walker River Basin, these national incentives, combined with determined local efforts to develop the resources of the land, have largely been a success, particularly in California's Bridgeport and Antelope valleys and Nevada's Smith and Mason valleys. By the late 1960s and early 1970s, however, federal legislation with respect to environmental priorities (National Environmental Policy Act), the plight of endangered and threatened species (Endangered Species Act), and a new emphasis on securing the rights of native-Americans, have come to reflect a new mandate for national policies.

More recently, agriculture has come under growing criticism in this and other areas of Nevada for its seemingly disproportionate use of limited water supplies and its adverse affects on habitat. Less well known and recognized is that in addition to its contributions to the Lyon County economy, waters diverted for agriculture in Smith and Mason valleys have, in fact, made important contributions towards habitat creation and preservation in those areas. Nonetheless, since the first white settlements were established in the Walker River Basin, agriculture, more than any other economic pursuit, has insured the economic viability and sustainability of this region. Only time will tell if a lasting solution can be reached whereby environmental, habitat, recreation, native American, and agricultural interests can co-exist and share the limited waters of the Walker River Basin.

### **Walker Lake and the Drought Period of 1987-1994**

During the eight-year period of 1987-1994, the major water basins of Northern Nevada experienced the worse drought period on record. Within the Walker River Basin, the snow water content averaged only 65 percent of normal, as compared to 149 percent of