

The Wichita Project

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The Wichita Project

In the late 1950s and early 1960s, in response to changing public needs, the Bureau of Reclamation built several municipal and industrial (M&I) projects. These projects did not have an irrigation component—a hallmark of most Reclamation projects—but rather provided water for growing urban needs. The Wichita Project in south central Kansas was one such project. Reclamation and the city of Wichita, Kansas, closely coordinated the design and construction of a pumping plant, Cheney Dam, and a pipeline that delivered water to serve the needs of Kansas's largest city. More than a major water supply, this project is part of a larger legacy in that it helped to usher in a new purpose and chapter of Federal water management in the West.

Project Location

The ninety-eighth meridian, the point on the Great Plains where rainfall is generally twenty inches or less, divides Kansas in two. The division is noticeable on the landscape. In the more arid western part of the state Buffalo grass grows on the short-grass prairie, while in the eastern section the tall-grass prairie grasses are taller and lusher. Yet, east or west, the state is subsumed by the expansive Great Plains, a distinct bioregion characterized by grasslands, caliche soil, and the Ogallala Aquifer.¹ The state's principal river—the Arkansas—originates in Colorado and flows east and southeast through four states to its destination: the Mississippi River. Cheney Dam spans the North Fork of the Ninnescah River, a tributary of the Arkansas River, about six miles north of the town of Cheney and twenty-four miles west of the town of Wichita, Kansas, at the common intersection between Kingman, Reno, and Sedgwick Counties.²

¹ Lamar, Howard R., ed., *The New Encyclopedia of the American West* (New Haven, Connecticut: Yale University Press, 1998), s.v. "Physiography of the United States."

² United States Department of Interior, Water and Power Resources Service, *Project Data* (Denver: Government Printing Office, 1981), 1333; U.S. Department of the Interior, Bureau of Reclamation, "Annual Project History,"

There are few large cities on the Great Plains; Kansas's built environment is predominantly rural, small towns surrounded by flat and treeless farmland. Wichita, situated on the north bank of the Arkansas River in south central Kansas, is one exception. The state's largest city, it boasted a population of over 344,000 at the turn of the twenty-first century.

Historic Setting

Prior to European contact, only a few thousand Indians divided among five tribes occupied present Kansas. Kansa, or Kaw, lived near the confluence of the Kansas and Missouri Rivers; Osage lived south of the Kansa. These tribes were transplants from the east and depended on farming, gathering, and hunting for sustenance; the Wichita and more numerous and powerful Pawnee Indians, who lived south in the Arkansas River Basin, also farmed and hunted. The Comanche, on the other hand, were nomadic and relied almost entirely on buffalo for survival.³

Francisco Vázquez de Coronado and his men made contact with the Wichita (Quivira) Indians on his ill-fated, southwest expedition in 1540-41. Disappointed at never having located the fabled seven cities of gold, Coronado and his men pressed on to the Great Plains in search of the riches of Quivira. There he found no riches, only scattered, sparsely inhabited Indian villages. However, Coronado and, later, Don Juan de Oñate Salazar (1601) had been impressed by the fertility of the land and possibility of agriculture in the region.⁴

The plains of Kansas were not settled for another several hundred years. In the settlement of the West, Kansas was a place to pass through as quickly as possible. It was flat

Wichita Project—Cheney Division, Kansas,” Volume I, 1961, 4, box 155, Accession 8NN-115-88-053, Record Group 115, National Archives and Records Administration, Denver, Colorado. Hereafter referred to as “Project History” followed by the volume.

³ Kenneth S. Davis, *Kansas: A Bicentennial History* (New York: Norton, 1976), 12.

and treeless, endowed with no great body of water or sufficient rainfall to entice men to settle it.

The Santa Fe Trail ran from Santa Fe to Independence, Missouri. In 1859, thousands of gold seekers crossed Kansas on their way to the gold rush at Pike's Peak. Still, there were by that time many Kansas settlers; they lived in crude dugouts, ate plain food, worked night and day cutting wood and plowing soil, and suffered the bitter winters of the plains. Kansas became a state in 1859, just prior to the start of the Civil War.⁵

In 1863 Wichita Indians began occupying the site of Wichita, where they constructed grass huts. The first white settler, J. R. Mead, arrived in the area around the same time and opened up a trading post to supply Indians and government agents. He was also instrumental in opening up the famous Chisholm Trail. Platted and incorporated, Wichita soon became the county seat of Sedgwick County.

Wichita was a cattle town, established two years before the Texas cattlemen began to drive their cattle northward to be shipped on railroads to eastern markets. Wichita's zenith as a cattle town began when a branch of the Santa Fe Railroad reached the city in 1872. For several years Abilene and Ellsworth were the principal cattle towns in Kansas but they were shortly abandoned because farmers, urban businessmen, and rural reformers worked to end the cattle trade. The construction of new rail lines west of Abilene also accelerated the decline of the cattle industry. By 1876 the cattle business had moved further west to Dodge City.⁶

Wichita started out as a center point for Texas drovers and businessmen seeking to make profits in the meat industry, then evolved into a prosperous milling and trade town. Like the rest of the state, farmers carved out plots of land, planted orchards, and grew crops by irrigation or

⁴ Davis, *Kansas*, 15-17.

⁵ Davis, *Kansas*, 72-73.

⁶ *The New Encyclopedia of the American West*, s.v. "cattle towns."

dry farming. Farmers suffered with the variability of climate and land. The dry years after 1888 and in the 1930s broke many Kansans, but even in wet years farming was uncertain and disappointing.⁷

In 1920 most Kansans still lived on farms and in small towns. The state's population grew slowly, and as it did people gradually migrated to urban areas—the largest of which came to be Wichita. By mid-century Kansas's population had become predominantly urbanized, though most towns were still relatively small with a population of 5,000 or less. As demography shifted to the cities, so, too, did the state's social, economic, and political milieu. As farmers sold their farms and moved to the cities, agricultural land came into the possession of fewer individuals who held larger tracts of land, workers took jobs in non-agricultural and ranching industries, and Kansas politics became predominantly conservative.⁸

Investigations

By 1940 Wichita's water supply reached crisis. While the city obtained its water from groundwater pumping, long range predictions showed that the city could not sustain continued pumping of the aquifer. Other solutions had to be found. The city had developed a series of municipal water supply wells northwest of the city, but cost and distance hampered further development. In 1938 the Federal Government provided funding for the Public Works Administration to tap into new wells for an augmented water supply. The Wichita Water Company distributed to the city the soft water pumped from the aquifer. About seven billion gallons of water were pumped in its fifth year—more water than water officials anticipated for 1965.⁹

⁷ *The New Encyclopedia of the American West*, s.v. "Kansas."

⁸ *The New Encyclopedia of the American West*, s.v. "Kansas."

⁹ D. Brian Hufford, *The eyes have it!: Wichita Water Department, 1882-1982* (Privately printed by Frank Wright,

Federal, state, and city water agencies began to scout around for a close, suitable surface water supply to supplement water from the aquifer. Notably, Federal bureaus either considered water projects or led important water studies in the Wichita area. In the 1930s the Corps of Engineers studied the feasibility of water projects on the White, Missouri, Arkansas, and Red Rivers, but poor water quality ruled out development of the waters of the Arkansas River. The Kansas Geological Survey Bulletin published scientific reports on the surface and ground water resources of the state. The Bureau of Reclamation also began to study the Arkansas River Basin and to explore the possibility of a municipal water project in Kansas. As early as 1949 Bureau officials considered an M&I project at Wichita and even spoke with city officials about the city's future water needs. Area engineer M. G. Barclay recommended the construction of dams at Cheney and Murdock on the Ninnescah River.¹⁰

Reclamation continued its investigations in the Wichita area; it surveyed and collected data on several sites, tested soil and water, and investigated potential sites to obtain impervious material (rock, sand and aggregates) for a dam. Reclamation determined that there was enough impervious material for the dam's construction, though the sites where the material would be gathered were shallow and contained high water tables. For the actual site of the reservoir, Reclamation considered the Cheney and Murdock sites on the North and South Forks of the Ninnescah River as the front runners. The most promising was Cheney, because the site could hold sufficient water and contained no "subsidence basins, sink holes, filled chimneys, or contorted beds." The reservoir site passed all project investigations.¹¹

Jostens, 1982), 41-49, 53

¹⁰ Hufford, *Wichita Water Department*, 40, 55.

¹¹ "Project History, Wichita Project," Volume I, 1961, 2-3. Preliminary reports included "Wichita Project, Kansas, Cheney Dam and Reservoir Site, North Fork of Ninnescah River," Oklahoma City, November 1, 1955;

"Construction Materials Report, Cheney Division, Wichita Project, Kansas," Oklahoma City Area Offices, March 1956; "Wichita Project, Cheney Division, Wichita, Kansas, Construction Materials Report," Supplement No. 1, July

Reclamation outlined the plan and presented it to the city of Wichita in early 1955. In 1957 it completed a feasibility report, and two years after that a reappraisal of the feasibility report, which became the basis of the project's authorization in Congress. Recognizing that a water project of this scale was not going to happen without government assistance, the city of Wichita eagerly endorsed this Federal water project in their backyard. In late 1956 the Wichita electorate approved issuance of revenue bonds to defray the city's share of the cost of the project, and the city's mayor publicly came out in support of a speedy authorization. Later, the Division of Water Resources of the Kansas State Board of Agriculture granted the city rights to sufficient flows of the North Fork Ninnescah River for the project.

Project Authorization

Legislation to authorize the project first went to the chambers of the Congress in June 1957. The project received formal approval from the Secretary of the Interior, Fred Seaton, and the Acting Commissioner of the Bureau of Reclamation, Floyd Dominy, but authorization stalled after members of the Wichita city commission and others objected to it. Three years later, on September 14, 1960, following hearings of the Committee on Interior and Insular Affairs, Congress passed the bill authorizing the Cheney Division of the Wichita Project in the amount of \$18,274,000. Authorization of the Murdock division would have to wait until there was a need for it.¹² In any case, congressional authorization of the Cheney Dam and Reservoir was a relief to city officials who had worked so hard for it. As A. E. Howse said at the groundbreaking ceremony,

1961, box 766, Accession 8NS-115-95-083, Project Reports, 1910-95, Record Group 115, National Archives and Records Administration, Denver, Colorado.

¹² *Project Data*, 1333-1334; House Committee on Interior and Insular Affairs, *Cheney Division, Wichita Project, Kansas: Hearing before the Subcommittee on Irrigation and Reclamation*, 86th Cong., 2nd sess. (June 3, 1960), 28.

The project has been investigated, engineered, reported, approved, authorized, budgeted, appropriated, validated, contracted, and started in the incredibly short time of seven years. This accomplishment could not have been possible without the complete cooperation of the public officials, departments and agencies concerned with water matters at the state and federal levels.¹³

The Plan

Despite the objections of some people in the Wichita area, the project did not generate the same amount of criticism sustained by a contemporary M&I water project in Oklahoma, the Norman Project. The reason for this may have been that Reclamation and the city shared the costs of construction. The city agreed to construct at its own expense the pipeline and pumping facilities, at a projected cost of \$7.6 million. Wichita also agreed to repay with interest over a fifty-year period the costs allocated to municipal and industrial water supply—another seven million dollars.¹⁴

The Wichita Project was a multiple-purpose development that, in addition to municipal water, also provided flood control, recreational opportunities, fish and wildlife protection, and, if the Murdock Division were ever built, irrigation potential. Still, its primary purpose was municipal and industrial water for Wichita and nearby urban areas. This was a new purpose for Reclamation water projects. As Commissioner Floyd Dominy stated before the House Irrigation and Reclamation Sub-committee in February 1959, Reclamation “would construct many of its present reservoirs on a different basis making maximum use of reservoir sites for multiple-purpose development.”¹⁵

Reclamation would construct the dam and reservoir; the city would be responsible for the pumping plant and aqueduct. Reclamation designed the dam as a rolled earthfill structure with a

¹³ Hufford, *Wichita Water Department*, 80.

¹⁴ House Committee, *Wichita Project*, 1, 2, 4, 7, 8.

crest length of 18,500 feet and storage capacity of 235,000 acre feet—145,000 acre-feet to M&I, 80,000 to flood control, and 10,000 to fish and wildlife and sediment deposition. Although the dam would be operated and maintained by Reclamation, municipal water users would bear the cost of O&M, except for expenses associated with flood control and fish and wildlife which would be paid by the government.¹⁶

Construction History

To provide field office and laboratory space during construction of Cheney Dam, Reclamation scheduled construction of a caretaker's residence and warehouse during the initial stages of the project. Bids for the contract to construct these facilities opened on January 4, 1962. The Lloyd Construction Company, Inc., received the contract and began work in early February. Reclamation accepted the contract as substantially complete on June 2, 1962. Project field forces occupied the building several days later.¹⁷

During the first part of the year, companies with facilities within the construction area began to relocate their facilities, so they would not interfere with construction of the dam. Overall, the companies removed seven miles of electrical distribution lines, five miles of telephone lines, two petroleum pipelines, and constructed just over sixteen miles of new petroleum pipeline.¹⁸

The contract for construction of Cheney Dam and Reservoir opened for bids in February 1962. Because of the scarcity of suitable riprap in the area, the contract allowed the construction

¹⁵ House Committee, *Wichita Project*, 23.

¹⁶ House Committee, *Wichita Project*, 4; U.S. Department of the Interior, *Wichita Project, Cheney Division, Kansas: letter from the Secretary of the Interior transmitting a report on the Wichita Project, Cheney Division, Kansas, pursuant to section 9(a) of the Reclamation Project Act of 1939 (53 stat. 1187)*, H. Doc. 198, 86th Cong., 1st sess. (Washington, DC: Government Printing Office, 1960), 26, 49.

¹⁷ "Project History, Wichita Project," Volume II, 1962, 3-4.

¹⁸ "Project History, Wichita Project," Volume I, 1961, 5-6; Volume II, 1962, 6.

company to use either riprap or soil-cement facing on the upstream slope of the dam. The bids received indicated that about \$700,000 would be saved with the use of soil-cement. On April 12 the \$6,661,961.35 contract for construction of Cheney Dam went to the low bidder, a joint venture of Cimarron Construction Company and Williams Brothers Construction Company, of Edmond and Tulsa, Oklahoma, respectively.¹⁹

Soon after receiving the contract, the contractor established office and construction yard facilities in the vicinity of the dam site. In early May the contractor moved in heavy construction equipment and began to clear the dam and borrow sites. By June 11 the contractor had sufficient equipment and manpower to begin full-scale construction activities, including embankment placement which began June 13. However, rainfall during the summer months—nearly double the normal precipitation—kept the contractor from making significant progress. Construction progressed—on a two ten-hour shift per day, five days a week schedule—until December when freezing conditions forced the contractor to halt earthwork activities for the year.²⁰

Foundation excavation in 1962 uncovered a spring in the soil that was unknown before the companies received the contract for the work. According to the contractor, “This condition has forced us to revise our original method of dewatering the core trench, and method of excavation.” After the dam was completed, the government gave the contractors an additional \$560,364.10 for the increased costs in the excavation and refill of the cutoff trench, as well as gravel bedding and riprap materials.²¹

During the year, the contractor excavated 2,615,897 cubic yards of material and placed 1,627,435 cubic yards of material in the dam embankment. Only the final two feet of shale cover

¹⁹ “Project History, Wichita Project,” Volume II, 1962, 4.

²⁰ “Project History, Wichita Project,” Volume II, 1962, 4-6.

²¹ “Final Construction Report on Cheney Dam, Wichita Project—Kansas,” 1965, 29, 33, box 767, Accession 8NS-

in the conduit sections remained to be excavated. Prior to the winter shutdown, the contractor completed the majority of the excavation and backfill in the cutoff trench east of the river; work progressed from the left abutment toward the river.²²

On September 18, 1962, despite the wet weather, work crews began placing the concrete on a one-shift per day basis. By the end of the year, they completed the floors of the outlet works, spillway chutes, and the stilling basins. The contractor also made significant progress on concrete placement in the outlet channel bridge and measuring flume. Additional concrete placement during 1962 included 2,546 cubic yards in the river outlet and spillway structures, 226 cubic yards in the outlet channel bridge, and 91 cubic yards in the measuring flume.²³

In late February 1963 the weather cleared enough to allow work on the cutoff trench excavation and Zone 1 embankment placement. The contractor completed the cutoff trench excavation and backfill on July 9. The initial river diversion took place March 14. A cofferdam about 7,600 feet upstream of the dam site forced the water into a pilot channel, carrying the water to a point 2,200 feet east of the river channel.

In 1963 the contractor made excellent progress, excavating approximately 5,665,000 cubic yards of material, moving 4,496,000 cubic yards of embankment, and placing 9,100 cubic yards of concrete. By the end of the year, the spillway, roadway bridge, and the gauging station had been completed. The river outlet works lacked only the shaft house, while the municipal outlet works lacked the roof for its access house and the walkway bridge piers. The river control gates in the municipal and river outlet structures were installed. The reservoir area was cleared for a distance of two miles upstream. In addition, the contractor completed the major structure

115-95-083, RG 115, NARA.

²² "Project History, Wichita Project," Volume II, 1962, 5.

²³ "Project History, Wichita Project," Volume II, 1962, 5.

excavation, coated and installed the nine-inch steel outlet pipe, and installed and stockpiled a major portion of the riprap and bedding.²⁴

The next year the contractors virtually completed all remaining work on the dam and reservoir. They placed concrete on the outlet works shaft house, the room for the municipal outlet works access house, and the two walkway bridge piers. They completed the earth work operations, placed soil-cement, and laid embankment from borrow and stockpile areas.²⁵

In addition to the contract for construction of the dam, other smaller contracts rounded out construction of the project. On November 7, 1963, the bid to clear the Cheney Reservoir site was awarded to Humphrey Contracting Corporation of Grand Rapids, Minnesota, the low bidder. The contract specified that clearing operations were to take place below elevation 1,422, with the exception of some small preserved areas and a few sites above the designated elevation. All work on this contract was completed by mid-1964. In December 1963 the city of Wichita opened bids for construction of the pumping plant and water transmission pipeline. In 1964 Reclamation awarded a contract to the Ritchie Brothers Construction Co. for the construction of recreational facilities.²⁶

Post-Construction History

Commissioner Floyd Dominy and city officials dedicated Cheney Dam on May 29, 1965, exactly three years after the groundbreaking ceremony. That summer water began to be pumped from the reservoir for use in Wichita, which used on average 370,032,000 gallons per month in 1965 and on average 311,410,000 gallons in 1966. Wichita had sufficient water to meet its immediate demands, but in the coming decades the demand would almost certainly outstrip the

²⁴ "Project History, Wichita Project," Volume III, 1963, 3-4.

²⁵ "Project History, Wichita Project," Volume IV, 1964, 3-4.

supply. In July 1974, ten years after completion of the dam, Wichita set a record of 2.064 billion gallons of water used in one month. High municipal and industrial water usage, combined with periodic droughts and high rates of evaporation and transpiration at Cheney reservoir during the hot summer months, made alternative water supplies a pressing concern in the Wichita area.²⁷

In 1965 Eldon Means of Means Laboratory, Inc., proposed construction of a desalinization plant to make potable the salty subflow of the Arkansas River, but no action was taken. The next year, Director of Water Robert Hess identified five alternative water supplies being considered by the Water Department. By 1970 there were eight potential water sources on the table: 1) the Arkansas River, 2) Corbin Reservoir, 3) wells in the Equus Beds, 4) Kanopolis Reservoir, 5) the South Fork of the Ninnescah River, 6) reservoirs on the Grand (Neosho) River or the Verdigris River in southeast Kansas, 7) the subflow of the Arkansas River, and 8) recycling of wastewater.²⁸

No plan was more seriously considered than the proposed dam at Corbin on the Chikaskia River. For many years, Federal, state, and local water agencies had considered a dam on the Chikaskia River because, unlike the tributaries of the Ninnescah River, it had a clean water supply. Reclamation studied its potential during the same time it investigated Cheney dam. It produced a reconnaissance report in 1955, prompting the formation of the Corbin Reservoir Development Association. For over ten years, water interests collected more information on Corbin Dam, leading to the completion and distribution of the report, *Plan of Development for Chikaskia Project*. Although the feasibility study recommended the Federal

26 "Project History, Wichita Project," Volume III, 1963, 1, 4; Volume IV, 1964, 5.

27 Project History, Wichita Project, Volume V, 1965-66, 7; Hufford, *Wichita Water Department*, 111-12.

28 Hufford, *Wichita Water Department*, 111-12.

water project, Reclamation temporarily set the project aside when it determined that construction costs and interest rates were too high to justify the project.²⁹

In October 1973, at the prodding of city officials and the Kansas Water Resources Board, Congress authorized Reclamation to resume studies on the feasibility of the dam for municipal water supply and flood control. Meanwhile, a report released by the City-County Planning Department concluded that Wichita's future water supply depended on construction of Corbin Dam. Yet the dam had its critics. The Chikaskia Landowners Association pointed out that a reservoir would displace more than fifty families; farmers in Oklahoma favored a dam site at Hunnewell, Oklahoma; environmentalists worried about the loss of free-flowing rivers, loss of wildlife habitat, and reduction of fish and wildlife populations; and still others worried about the cost of the project. For several years the debate over construction of the Corbin Dam intensified. When in 1980 Reclamation released the latest cost figures in the revised *Feasibility Report and Draft Environmental Statement on the Chikaskia Project*, putting the cost at \$237 million—more than double the previous estimate—city officials decided not to proceed with the project.³⁰

From time to time Cheney Dam required repair. The reservoir level gauge installed in January 1965 had to be replaced later in the year. In 1966 city workers repaired the protective riprap around the spillway intake tower that had been damaged by high gusts of wind. The wind also damaged some areas of soil cement on the dam but not enough to warrant immediate repair. Wind gusts of 85 miles per hour did extensive damage in 1971, and the repair work was contracted out to Mid-States Construction Company, Inc., of Wichita. Moreover, strong waves

²⁹ Hufford, *Wichita Water Department*, 112-13.

³⁰ Hufford, *Wichita Water Department*, 113-22.

contributed to the soil-cement damage on the dam. The Engineering and Research Center in Denver recommended repairs be made to the soil-cement every five to ten years.³¹

Uses of Project Water

The Wichita Project provides storage and delivery of supplemental municipal and industrial water to Wichita, Kansas. Cheney Reservoir serves as the forebay for the city's pumping plant and pipeline, which transfers water to the water treatment facilities. In 2003 the project provided 33,838 acre-feet of water to an estimated population of 344,000.³²

Cheney Dam and Reservoir also provide flood control benefits to towns and farms located downstream of the project. The U.S. Army Corps of Engineers, the city of Wichita, and Reclamation jointly coordinate flood control operations. In an effort to protect downstream areas from flooding, water has been released from the reservoir periodically since October of 1968, when it reached conservation storage. The flood control benefits of the project permitted irrigation of about 3,700 acres of farmland below the dam, although the project is not designed to provide water for irrigation.³³

Construction of the dam and reservoir provided an otherwise arid region of Kansas with a variety of recreational and fish and wildlife benefits. The Kansas State Park and Resources Authority manages Cheney State Park at the reservoir. The park includes approximately 1,900 acres of land and over 5,400 acres of water. The Kansas Forestry, Fish, and Game Commission manages an additional 5,200 acres of land and 4,100 acres of water for fish and wildlife conservation and management.

³¹ "Project History, Wichita Project," Volume VI, 1967-69, 4; Volume VII, 1970-76, 2-3; Volume IX, 1981-83, 37.

³² Oklahoma-Texas Area Office, Great Plains Region, <http://www.usbr.gov/gp/otao/>.

³³ *Project Data*, 1333.

The reservoir boasts a variety of sport fish common to Kansas including white bass and walleye—favorites of anglers—crappie, channel catfish, striped bass, and largemouth bass. In addition, the recreation area provides excellent camping, boating, swimming, and picnicking facilities; trailer park facilities include electric, water, and sewer hookups. A million visitors per year used the recreation facilities at the reservoir between 1967 and 1969.³⁴

Conclusion

At the founding of the United States, Kansas was, in the words of historian Kenneth S. Davis, “a vast windswept slab of prairie whose size and shape were as yet undetermined, bearing upon its bosom no large body of water, no dependably navigable stream, no hill more than a few hundred feet high.”³⁵ By the end of the twentieth century, Kansas had been transformed. Still flat and arid, it could now support larger populations thanks to the large bodies of water the Bureau of Reclamation propped up behind dams. Cheney Reservoir was one of these, without which Wichita’s water supply would have been severally strained, if not entirely depleted. With a secure water supply, Wichita has become the largest city in the state.

The Wichita Project was important because it was a model for cooperation between the Federal Government and a city. Each assumed its share of the costs, construction, and risks inherent in a large-scale water project. Designed primarily for municipal and industrial use, the water project helped usher in a new era of Reclamation water management in supplying water to urban areas. Between 1970 and 2000 Reclamation doubled its delivery of water to urban populations, and that percentage may continue to rise as the West grows in population.³⁶

³⁴ U.S. Department of the Interior, Bureau of Reclamation, *1992 Summary Statistics* (Denver, [1995]), 71, 113; *Project Data*, 1334-1335.

³⁵ Davis, *Kansas*, 7.

³⁶ Marca Wineberg, *Water Use Conflicts in the West: Implications of Reforming the Bureau of Reclamation’s Water*

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