

Washita Basin Project Oklahoma

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Washita Basin Project

Located adjacent to America's arid west/humid east division line known as the 100th meridian, western Oklahoma's rolling uplands are susceptible to unpredictable weather cycles. "Erratic" best describes seasonal and annual rainfall patterns, with periods of profound drought spelled by bursts of intense rainfall. These roller-coaster patterns shaped the environmental history of the area's Washita River Basin. Over time, frequent serious floods within this narrow, 8,000 square mile basin, most notably the April 1934 Hammon Flood in Roger Mills County, caused loss of property and life to the point that local, state, and Federal governments sought solutions to mitigate excessive dryness, moisture, and other unpredictable climactic phenomena.

In the wake of the harsh "dust bowl" that decimated the Great Plains during the 1930s—and the Hammon Flood—in the late 1930s the Bureau of Reclamation and the water resources division of the Oklahoma Planning and Resources Board began formal reconnaissance studies of the Washita River Basin. Although Reclamation examined the basin as early as 1902, these new investigations, fueled by recent memories of killer droughts and floods, were more meticulous. The goal was straightforward: formulate a comprehensive plan for efficient utilization of the basin's water resources. Coordinated with input from other Federal agencies, these studies concluded that the Washita River Basin had three pressing needs: provide a more reliable municipal and industrial water supply, regulate the river's flows to check destructive flood cycles, and increase the availability of irrigation water to stabilize crop and livestock production. Much like other

natural disasters providing impetus for improvement, so began Reclamation's Washita Basin Project, one of only six Reclamation projects located within the Sooner State.¹

Physical Setting

The headwaters of the roughly 650 mile long Washita River lie in northeastern Texas's panhandle at the eastern edge of the high plains. Beginning at an elevation of 3,000 feet above mean sea level (amsl), the Washita crosses the 100th meridian at the Texas/Oklahoma border, then meanders southeasterly through drier western and moister southern Oklahoma, where it empties into the main stem of the Red River near Denison, Texas, at elevation 600 feet amsl. The upper Washita River Basin investigated by governmental entities in the 1930s and 1940s is 270 miles long, and lies entirely within western Oklahoma. Most lands surrounding the river are gently rolling and well-suited for grazing. Generally, the river's terraces and alluvial flood plain, and within the lower reaches of larger tributaries, contain the best agricultural lands.²

Geographically, the upper Washita Basin lies within three geographic regions, from west to east:: High Plains, Gypsum Hills, and Red Bed Plains, with the semi-arid High Plains region seeing the thinnest population densities and largest farms. All three regions are generally level, although all have topographic variations caused by wind and water erosion.³ Geologically, the upper river basin lies on top of what geologists call Permian Age "Whitehorse sandstone" and "red beds," with only minor folding and faulting over the millennia. Preliminary reports by Reclamation geologists on potential

1. The other five are Arbuckle, W.C. Austin, McGee Creek, Norman, and Mountain Park.

2. Senate Committee on Interior and Insular Affairs, Subcommittee on Irrigation and Reclamation, *A Bill to Authorize the Secretary of the Interior to Construct, Operate, and Maintain the Washita River Basin Reclamation Project, Oklahoma: Hearing on S.180*, 84th Cong., 1st Sess., April 25, 1955.

3. John Morris, et. al., *Historical Atlas of Oklahoma* (2nd ed. rev.). Norman: University of Oklahoma Press, 1976, 3.

dam sites within the basin assigned the area a favorable grade, and mentioned that as long as engineers followed normal grouting and cut-off procedures, they considered dam and reservoir construction in the area as “geologically feasible.”⁴

Prehistoric and Historic Setting

The Washita River Basin and its major tributaries have been home to four major Plains Indian groups: the “high plains” Kiowa and Plains Apache (also known as the Kiowa Apache), and the “prairie plains” Wichita and Caddo. Paleontological evidence suggests that Wichita and Caddo Indians shared western Oklahoma’s lands with Kiowas and Plains Apaches. Additionally, before the Wichita tribe signed their first treaty with the United States in 1835, then consolidated, they were a collection of culturally similar subgroups that included the Taovaya, Iscani, Wichita, Waco, and Kitsai, and claimed territory ranging from southern Kansas into central Texas. These groups spoke Wichita, a Northern Caddoan language, which contained several sub-dialects.⁵

Unlike the native Caddo and Wichita, the Kiowas and Plains Apaches migrated south from the northern plains in the nineteenth century in retreat from hostile Cheyenne and Sioux tribes. Yet the Spanish, who established contact with the Wichita and other prairie plains tribes as early as 1541, mention in their sources that Kiowas lived on the southern plains as early as 1732; whether this is true is still debated. By 1748 the horse, introduced into the area by the Spanish (then obtained by Kiowa and Plains Apaches through Caddos and Wichitas) reshaped their cultures, most notably changes in wealth,

4. D. H. Jepsen, et. al., “Preliminary Geological Report, Fort Cobb Dam Site,” and “Preliminary Geological Report, Foss Dam Site—Washita River Basin,” November and December 1946, both in RG 115, Records of the Bureau of Reclamation, Box 861, National Archives and Records Administration, Rocky Mountain Region, Denver, Colorado. (Hereafter RG 115, Box #, NARA Denver.)

5. William Newcomb, Jr., “Wichita,” in Raymond J. DeMallie, ed., *Handbook of North American Indians, Plains* (Volume 13, Part 1 of 2), Washington, D.C.: Smithsonian Institution, 2001, 548.

status, and leadership hierarchies. Also, the horse's introduction allowed Kiowa and Plains Apaches to become skilled mounted bison hunters; eventually the Kiowa, in 1806, allied with the Comanches of Texas and eastern New Mexico, and expanded their hunting territory.⁶

Because what would become Oklahoma fell under their claimed area, Spanish explorers had profound impact upon the area's history. In 1540, Francisco Vásquez de Coronado, fresh from failing to locate the Seven Golden Cities of Cíbola, wandered east and north into Oklahoma and in 1541 reached Quivara (near present-day Wichita) on the Arkansas River. Ancient ancestors of the Caddo tribe, Quivarians shared many of the same cultural traits as the Wichita collective, including cone-shaped huts and cultivated gardens. In the late sixteenth century, Juan de Oñate, from his Santa Fé headquarters, branched out extensively and found his way to Quivara. The Spanish also established a major trade route from New Mexico to where the Washita River meets the Red River. Starting in Santa Fé, this trail crossed the high plains of northeastern New Mexico and the Texas panhandle, entered Oklahoma near the North Fork of the Red River, then followed this river's course to the Washita/Red confluence.⁷

As with the Spanish, France also claimed a large area of North America including Oklahoma, mostly to block westward expansion of the burgeoning English colonies. The first French explorers to reach the Mississippi River were Father Jacques Marquette and Louis Joliet in 1673. Nine years later, in 1682, Robert Cavalier Sieur de la Salle explored the Mississippi River from the Illinois River south to the Gulf of Mexico. Sieur de la

6. Jerrold Levy, "Kiowa," and Morris Foster and Martha McCollough, "Plains Apache," in Raymond J. DeMallie, ed., *Handbook of North American Indians, Plains* (Volume 13, Part 2 of 2), Washington, D.C.: Smithsonian Institution, 2001, 907-8, 926-7.

7. Morris, *Historical Atlas of Oklahoma*, 11.

Salle became the foremost voice for a vast French inland empire, claiming all lands drained by the Mississippi River and its tributaries. In the early eighteenth century, French trappers in search of pelts came to Oklahoma by the hundreds, trading and intermarrying among native groups. In the end, colonial struggles between the French and the English, which culminated in the French and Indian War (1754 to 1763), expelled the French out of interior North America. The Treaty of Paris (1763) that ended the global Seven Years' War awarded to Spain (as part of the Louisiana Territory) North America west of the Mississippi River, while England received all lands to the east.⁸

As with most colonial societies, all would not remain stable. The Treaty of San Ildefonso (1800) transferred Louisiana Territory from Spanish control to **Napoleonic France**. The decades following the American Revolution and the establishment of the United States of America witnessed increased pressure by American investors and politicians to explore the trans-Mississippi West for expansion and settlement purposes. This included gaining full control of the Mississippi River as a commercial outlet, and securing lands to the West. While President Thomas Jefferson originally wished to purchase the diminutive Island of New Orleans, he was astonished when Napoleon's diplomatic representative offered to sell him all of Louisiana Territory to keep Great Britain from capturing the territory in case of war, viewed by the French as imminent. On April 30, 1803, in what is historically known as the Louisiana Purchase, France sold Louisiana Territory—which included Oklahoma—to the United States for \$11,250,000; two weeks later, on May 15, Great Britain declared war on France. Further adjustments followed; the Adams-Onís Treaty (1819) not only established a new international border

8. Ibid., 12-13. The French and Indian War was the North American theatre of the larger global conflict known as the Seven Years' War, viewed by military historians as the first "world war." For more on the Seven Years' War, see <http://www.tax.org/museum/1756-1776.htm>

with Spain, but set into stone present-day Oklahoma's southern (Red River) and western (100th meridian) borders, minus the "No Man's Land" panhandle.⁹

Early American explorers considered Oklahoma's lands unsuitable for Anglo settlement. Thus, the early nineteenth century witnessed one of the largest forced human relocations in American history. In this process of removal, President Andrew Jackson forcibly ordered the "Five Civilized Tribes," whose lands in North Carolina, Georgia, Florida, Alabama, and Mississippi were deemed more valuable for white settlement, to relocate to lands in Oklahoma, then known as "Indian Territory." Known as the "Trail of Tears," over the course of two decades the Chickasaw, Choctaw, Creek, Cherokee, and Seminole tribes marched west to resettle on lands claimed by Osage, Comanche, Kiowa, and other plains tribes. While these Five Civilized Tribes attempted to eke out new lives on new lands, they found themselves ostracized and harassed by plains tribes, especially in western Oklahoma's Canadian, Cimarron, and Washita River basins. Most of the five Civilized Tribes used these lands as their hunting grounds.¹⁰

This pressure on native settlements increased after the Civil War, in which most of the Five Civilized Tribes sided with the Confederacy—but not all did. Despite those who stayed neutral or sympathized with the north, the Federal government imposed harsh punishments upon these tribes, forcing them to cede their western lands for railroad construction and establishment of reservations for plains tribes being consolidated and moved from other sections of the Great Plains. Southern Cheyenne, Kiowa, Caddo,

9. Howard R. Lamar, ed., *The New Encyclopedia of the American West*, New Haven, Yale University Press, 1998, s.v. "Louisiana Purchase" and "Adams-Onís Treaty."

10. Morris, *Historical Atlas of Oklahoma*, 20.

Wichita, and Arapaho tribes eventually received large holdings of land for reservation purposes, lands the Five Civilized Tribes used for subsistence.¹¹

The upper Washita River Basin was also the scene of one of the more notable Indian battles in American military history. On November 27, 1868, Lt. Colonel George Armstrong Custer and his Seventh Cavalry, responding to reports of Indian depredations in Kansas territory, fought and defeated Cheyenne Chief Black Kettle at the Battle of the Washita, despite the fact the Chief and many of his followers had peaceful intentions. That this battle occurred on reservation lands—and that the military commander at nearby Fort Cobb guaranteed the Indians' safety—made no difference to the ambitious, mercurial Custer. Although humanitarian critics at the time roundly decried his attack, the Army recovered from Black Kettle's camp property stolen from various Kansas military camps, including government mules, mail, and domestic property.¹²

Fort Cobb, founded in 1859, was among one of the first small, scattered trading and military posts established as the first non-Indian settlements in western Oklahoma. Others included Fort Washita (1842) on the river's east bank 22 miles above its mouth, Fort Arbuckle (1851) near Wildhorse Creek in southern Murray County, and Fort Sill (1869) near Lawton. With the establishment of these forts, after the Civil War the cattle industry became a major factor in the region's settlement patterns. During the war, huge herds of cattle accumulated in Texas, and after the war drovers herded them north on various trails across Oklahoma to railroad shipping points in Kansas. The most famous was the Chisholm Trail, which extended from Anadarko, Oklahoma, to Wichita, Kansas. During these drives, cattle raisers became enamored with western Oklahoma's rolling

11. Lamar, *The New Encyclopedia of the American West*, s.v. "Oklahoma."

12. Paul Andrew Hutton, ed., *The Custer Reader*, Lincoln: University of Nebraska Press, 1992, 95-6. These lands are now part of the Washita Battlefield National Historic Site.

grasslands as potential grazing lands, and worked out leases with local Indian tribes for large areas of land to establish and conduct their businesses. This was also the period of extensive railroad construction in the area, including the Missouri, Kansas, and Texas, and the Atchison, Topeka, and Santa Fe railroads.¹³

As more cattle drovers herded their stock north to Kansas railheads, pressure increased on the Federal government to release more unoccupied Indian lands for Anglo settlement. In 1885, Congress enacted legislation allowing purchase of unclaimed Indian lands, and the Dawes Severalty Act of 1887, also known as the General Allotment Act, codified the 1885 act to discharge Indian Territory's unoccupied lands for settlement by non-Indians. In 1889, President Benjamin Harrison authorized opening of unoccupied lands, and on April 22 of that same year, the first of many historic "runs" took place; it is estimated that 50,000 to 60,000 immigrants participated in this first run alone. Nearly overnight, what would become major Oklahoma cities sprung up: Norman, Oklahoma City, Kingfisher, Edmund, Guthrie, to name a few. While most of the new immigrants settled on town lots, the rest staked out new lives on quarter-section claims covering the approximately 2 million acres of available farm lands. Shortly thereafter, out of these lands and the panhandle, Congress created the Territory of Oklahoma (a combination of the Choctaw words "okla" meaning "people," and "huma" meaning "red") out of Indian Territory's western half, while the eastern half retained its Indian Territory moniker.¹⁴

More land runs followed in the 1890s. In 1892, the Federal government opened Cheyenne and Arapaho lands surrounding the upper Washita River Basin in Oklahoma Territory for white settlement. While the eastern sections of this land filled up rapidly,

13. Morris, *Historical Atlas of Oklahoma*, 27, 46.

14. Lamar, *The New Encyclopedia of the American West*, s.v. "Oklahoma."

the arid western sections remained prime cattle grazing land for many years afterward. The largest ever recorded run happened in 1893, when 100,000 immigrants stood at the starting line anxious to lay claim to nearly 6 million acres of quarter-section lands in the Cherokee Outlet, located immediately south of the current Kansas border. Similar to the 1892 land rush to Cheyenne and Arapaho lands, the Cherokee Outlet's eastern section filled before the western section, which was still dominated by the cattle industry, and it would be several years before runners claimed these lands. More lotteries and land rushes to various sections of Oklahoma and Indian territories followed in 1895, 1896, 1901, and 1905, when the final rush officially disposed all remaining open lands.¹⁵

Now fully settled, securing statehood became a priority in the minds of territorial politicians. Neither Oklahoma nor Indian territories, however, desired to be combined into one state. In 1906, Congress passed the Oklahoma Enabling Act to provide for election of 112 delegates who would create a new state constitution. After the September 1907 constitutional convention at Guthrie, where electors ratified the proposed state constitution by a vote of 180,333 to 73,059, on November 16, 1907, Oklahoma and Indian territories united to become America's forty-sixth state. Three years later, driven by a powerful Democratic bloc led by Thomas P. Gore and Robert L. Owen, a special election shifted the state capital from Republican stronghold Guthrie to Oklahoma City, where it has remained since.¹⁶

The new state constitutional convention also created counties and their seats, many of which existed before statehood. Five counties comprise lands served by Washita Project: Custer—county seat Arapahoe; Washita—county seat Cordell; Kiowa—county

15. Morris, *Historical Atlas of Oklahoma*, 48; Lamar, *The New Encyclopedia of the American West*, s.v. "Oklahoma."

16. Ibid.

seat Hobart; Caddo—county seat Anadarko; and Grady—county seat Chickasha. Of the five, Custer, Washita, Caddo, and Kiowa existed as Oklahoma Territory counties before statehood, while the future Grady County was Recording District 16 of Indian Territory. It gained county status when Oklahoma gained statehood.¹⁷

Project Investigation and Authorization

In the same decade Oklahoma attained statehood, between 1902 and 1907 the U.S. Reclamation Service commenced field surveys and studies of potential irrigation projects within Oklahoma. Because of the transitional moist-to-semi-arid nature of most lands in the state's western regions, most initial Reclamation studies focused on areas adjacent to the 100th meridian. The mean annual rainfall in this part of Oklahoma varied from sixteen to thirty inches, and while Reclamation acknowledged this level provided for good to fair crop production, local interest existed in a comprehensive reclamation program. Among the first basins investigated included the North Fork of the Red River, on which Reclamation's W.C. Austin Project is located, and the Canadian and Cimarron river basins.¹⁸

In 1903, Reclamation started its first investigation into a possible irrigation project on the upper Washita River Basin. That year, the agency made a brief field inspection in the vicinity of Cheyenne, and in 1905 made a thorough reconnaissance of Roger Mills, Custer, and Washita counties. Reclamation made no further investigations on the basin until 1924, when they released a report on the proposed Saddle Mountain Project on Stinking Creek south of Mountain View. It concluded that since Saddle

17. Morris, *Historical Atlas of Oklahoma*, 57, 59.

18. U.S. Department of the Interior, Bureau of Reclamation, "Report on Proposed Irrigation Projects in Southwestern Oklahoma," October 1924, pp. A-E *passim*, in RG 115, Box 929, NARA Denver.

Mountain Creek had no records of runoff for low and high water cycle years, the project was “not worthy” of further consideration.¹⁹

Environmental events of the 1930s, however, quickly changed perceptions. Heavy, lengthy droughts lingered, causing low crop production and inadequate water supplies for municipal and domestic purposes, and when it rained, it did so with unbridled ferocity. Throughout the basin—and much of the Great Plains—land and stream erosion became a major issue. But perhaps the greatest incentive for some kind of a comprehensive water control project came with the Hammon Flood of April 1934. In this catastrophe, which started as a torrential rainfall (fourteen inches in six hours) upstream from the small town of Hammon in Roger Mills County, the normally docile Washita swelled up to a two-mile-wide swath of devastation that killed seventeen people, including six in one family, washed away miles of railroad track, and swept away thousands of head of livestock. It was a catastrophe Roger Mills County had never before witnessed, and one its residents never wished to witness again.²⁰

As a result of this flood, the State of Oklahoma teamed up with Reclamation and other Federal entities like the Army Corps of Engineers and Department of Agriculture to study the problem, then formulate a plan for not only developing the basin’s water resources, but controlling those resources to prevent another Hammon disaster. Between 1938 and 1943, the state and its partners conducted numerous investigative trips to the upper Washita, talking to receptive locals about the need for a comprehensive multi-purpose water project, one that would address irrigation, flood control, and M&I needs. In 1943, Reclamation released an unpublished report that served as a basis for selecting

19. Ibid., p. E.

20. See <http://www.house.gov/lucas/news/speech2004/hammonflood.html>. Early Reclamation project reports misspelled Hammon as “Hammond.”

projects for detailed investigations; these investigations occurred intermittently until 1949.²¹

As investigative work progressed, Reclamation discussed elements of the plan with local residents and politicians. On the basis of these discussions, Anadarko and the surrounding area expressed interest in Cobb Creek, a Washita River tributary, as a good site for a multi-purpose dam and reservoir, along with another multi-purpose facility on the Washita River a few miles north of Foss in Custer County, several miles southeast of Hammon. In February 1951 Reclamation's Southwest Regional Director submitted the first draft of the Washita River Sub-Basin feasibility study to the State of Oklahoma. This report contained firm proposals for Fort Cobb and Foss dams and reservoirs, and for five other facilities not recommended for immediate authorization. A couple months later, on April 10, the state submitted a letter concurring with Reclamation's findings, calling for immediate authorization of Fort Cobb Dam and Reservoir, Foss Dam and Reservoir, and related appurtenant works including a pair of buried, municipal-feed aqueducts.²²

Once local politicians and Reclamation Commissioner Michael Straus expressed their support for project authorization, in 1951 Anadarko citizens organized the Washita Basin Improvement Association (WBIA). Community leaders from numerous towns including, Clinton, Elk City, Chickasha, and other smaller surrounding communities rallied under the WBIA banner to serve as a collective liaison between local interests and Reclamation. This grassroots support proved valuable as the "long and tedious" project

21. U.S. Department of the Interior, Bureau of Reclamation, *Annual Project History, Washita Basin Project*, Vol. 1, 1958, 1. RG 115, Box 150, NARA Denver. Hereafter *Washita Basin Annual Project History*, Vol., Year, and box number (if different).

22. U.S. Department of the Interior, "Plan of Improvement for Washita River Sub-Basin, Red River Basin, Oklahoma and Texas." Project Planning Report no. 5-13.02-0 (February 1951), 31-32.

authorization process, as one Reclamation official called it, continued throughout the early to mid 1950s.²³

And a long, tedious process it was. Legislative action was not achieved on the project in the 82nd Congress' second session in 1952. In 1953, despite making it to committee discussion levels in the House and the Senate, the first session of the 83rd Congress failed to move the authorization bill out of committee. Despite a detailed report and recommendations by Reclamation's Southwest Regional Director H. E. Robbins to authorize and construct Foss and Fort Cobb facilities, the bill died in both committees.²⁴

This legislative lethargy continued into the 84th Congress. In 1954, in the first session, the Senate passed a modified version of the bill as S.118, but the bill failed to pass the House and expired in committee. Despite unexplained House misgivings, the Senate persisted. In the same session, the Senate again passed a modified bill S.180 authorizing the project's construction—but again the Senate bill ran into yet another House barricade. This time, however, instead of referring the bill to a committee and risking its expiration, the House carried the bill over to the second session, where it passed in early February 1956. A couple weeks later, on February 25, 1956, President Dwight D. Eisenhower signed the Bill authorizing Washita Basin Project as Public Law 419, 84th Congress, Second Session.²⁵

Immediately after the project's authorization, local Master Conservancy Districts (MCD) were organized to contract with Reclamation for repayment of project costs. At

23. *Washita Basin Annual Project History*, Vol. 1, 1958, 2.

24. *Ibid.*, 2; U.S. Department of Interior, Office of the Secretary, *A Report on a Plan of Improvement for Washita River Subbasin, Red River Basin, Okla. and Tex., Pursuant to Section 9(a) of the Reclamation Project Act of 1939 (53 Stat. 1187)*. 83th Congress, 1st Session, House Document no. 219, July 30, 1953. RG 115, Box 929, NARA Denver.

25. *Washita Basin Annual Project History*, Vol. 1, 1958, 2-3.

that time, it was decided two separate MCD's should exist, one for each facility. On December 21, 1956, the Fort Cobb Reservoir MCD was organized, and included the towns of Fort Cobb and Anadarko, along with the potential Anadarko-Verden and Fort Cobb Irrigation Districts. One day later, on December 22, the Foss Reservoir MCD was organized and included the towns of Corn, Clinton, Bessie, Cordell, and Rocky, with the Foss Irrigation District established two months later. Reclamation and the Fort Cobb MCD signed their repayment contract on July 23, 1957, while the Foss Reservoir MCD finalized their negotiations with Reclamation on February 14, 1958. That same year, preliminary construction started, Fort Cobb Division in February, Foss Division in October.²⁶

As authorized, the Washita Basin Project consists of two divisions: Fort Cobb and Foss. Fort Cobb Dam is on Pond (Cobb) Creek five miles north of Fort Cobb, and about five miles above the confluence of Cobb Creek and the Washita River. The dam is a zoned earthfill structure containing 3,569,185 cubic yards of embankment, with a crest length of 9,900 feet, a crest width of 30 feet, and a structural height of 122 feet. Fort Cobb Reservoir has a total capacity of 143,740 acre-feet and covers an area of 5,956 acres. The uncontrolled morning glory spillway in the dam's left abutment consist of a concrete intake structure, concrete conduit, and concrete chute and stilling basin.²⁷

Foss Dam is on the Washita River approximately 15 miles west of Clinton. A slightly larger version of Fort Cobb Dam, it is a zoned earthfill structure with a crest length of 18,120 feet, a crest width of 30 feet, and a structural height of 140 feet. It contains 10,638,430 cubic yards of embankment. Foss Reservoir has an area of 13,141

26. Ibid., 4-5.

27. Bureau of Reclamation *Dataweb* <http://www.usbr.gov/dataweb/html/washita.html>

acres. Total reservoir capacity is 436,812 acre-feet. High flow water releases are made through an uncontrolled morning glory spillway on the dam's right abutment. Since repayment negotiations between Reclamation, the Foss MCD, and the Foss Irrigation District for irrigation development downstream of both facilities were never successful, no irrigation facilities were built. However, two buried aqueducts totaling 71.7 miles, the Anadarko and Foss, were constructed in 1959-1961 and 1960-1962, respectively, to deliver municipal and industrial water to their respective MCD cities and towns.²⁸

Project Construction

Once negotiations finalized, construction commenced on both facilities. On August 14, 1957, Reclamation opened the Washita Basin Project Office in Anadarko, with a force of about 100 employees. The first project facility to begin construction was Fort Cobb Dam, whose main features included the dam, spillway, outlet works, municipal outlet, and access roads. On November 25, 1957, Reclamation opened bid invitations under Specifications No. DC-4988. The project office received sixteen bids, with Hyde Construction Company and Cook Construction Company (a joint venture, hereafter Hyde-Cook) of Jackson, Mississippi, submitting the low bid of \$3,318,431.75, a little over \$1 million below engineering estimates. On February 3, 1958, Reclamation awarded contract No. 14-06-D-2714 to Hyde-Cook, with notice to proceed received by the primary contractor eight days later. Specifications allowed 700 days for completion of work, which set January 12, 1960, as Fort Cobb's tentative completion date. At the same time, Reclamation awarded several minor construction and relocation contracts to various low bidders, including field office construction at the damsite, the relocations of

28. Ibid.

various utility lines and roads, and relocation of five graves at a private cemetery located near the damsite.²⁹

On the wet morning of March 15, 1958, a groundbreaking ceremony was held at the damsite, with many dignitaries attending, including Reclamation Southwest Regional Director Robert Jennings, WBIA President Albert Connel, and guest of honor Oklahoma Senior Senator Robert S. Kerr, who arrived in time to help turn the first spade of earth. Despite the inclement weather, nearly 400 people attended the ceremony, with over 1,000 attending a celebratory barbeque at Randlett Park in Anadarko that afternoon.³⁰

The second major project construction effort initiated by Reclamation was Foss Dam, whose principal features included the dam, spillway, river outlet works, canal outlet works (for the irrigation system that was never built) and a municipal outlet. On August 26, 1958, Reclamation issued bid invitations under Specifications No. DC-5100. Wunderlich Contracting Company of Palo Alto, California, (hereafter Wunderlich), submitted a low bid of \$7,351,557, \$628,670 below the engineer's estimate. On October 17, Reclamation awarded Contract No. 14-06-D-3090 to Wunderlich, with notice to proceed acknowledged by Wunderlich on October 31. Specifications allowed 1,100 days to complete the work, with an established completion date of November 4, 1961. Wunderlich quickly erected a field office and repair shop on site, and on November 12 started work. Additionally, Reclamation awarded six minor contracts to various companies for utility and road relocations, and to build a temporary water system at the damsite. On November 18, much like Fort Cobb Dam, officials held a groundbreaking ceremony under cold, dreary skies where dignitaries like Reclamation Commissioner

29. *Washita Basin Annual Project History*, Vol. 1, 1958, 18-20.

30. *Ibid.*, 19.

Wilbur Dexheimer and Senator Robert Kerr addressed the crowd. And like Fort Cobb Dam's kickoff party, locals held yet another barbeque with over 1,000 in attendance.³¹

Reclamation proceeded rapidly with land rights-of-way acquisitions. For the project, 170 contracts were negotiated for the acquisition of property required to build the project, either by contract negotiation or condemnation. Appraisals included rights-of-way for leasehold interests, flowage easements, aqueduct right-of-way-easements, and fee title. Land acquisitions for the Foss Division, however, did not proceed as smoothly as for Fort Cobb Division, due to farmers near Lawton organizing to halt right-of-way acquisitions for the proposed expansion of Fort Sill Military Base. Although organizers in the Foss Division did not try to block the facility's construction, they knew of the Fort Sill issue, and attempted to secure inflated prices for their lands. Another factor was the highly publicized construction of a major State and Federal Highway in the vicinity of Foss Division. Several tracts of land were condemned, with high deficiency judgments awarded to land owners.³²

Although not much work was done on the Foss facility in 1958, despite frequent rainy weather Hyde-Cook proceeded to get some initial work underway on Fort Cobb. In March, Hyde-Cook completed the temporary diversion channel for Cobb Creek, and began the dewatering process around the damsite with assistance from sub-contractor Subgrade Engineering. Total excavation at this time amounted to 110,000 cubic yards, mostly for foundation strippings, and cutoff trench and spillway structure excavation. Over the next few months, Hyde-Cook proceeded efficiently on preliminary earthwork,

31. Ibid., 46.

32. Ibid., 52-53. No mention was made of which highway was being built, but since this was the late 1950s, it is a safe bet the condemnations revolved around expansion of U.S. Highway 66's right-of-way into the future Interstate 40, since the Washita crosses this highway near Clinton.

and made preparations for concrete placement, which included erecting a batching and mixing plant, fabricating forms, and obtaining reinforcement steel. On May 2 the first concrete was placed for the terminal well and outlet works conduit, and by August 735 cubic yards of concrete had been placed in the outlet works and the spillway structure.³³

And despite losing a few shifts to rain and other inclement weather, Fort Cobb Dam's embankment was beginning to take shape. By year's end, Reclamation reported that 2,169,158 cubic yards had been set into the dam's embankment. Concrete placement continued at the same pace as in previous months, approximately 700 cubic yards per month. The project history reported that, as of December, based on Hyde-Cook's earnings to date, 65 percent of contract items had been completed. On Foss Dam, workers rapidly began spillway, river outlet, and river diversion foundation excavation, and started clearing and burning vegetation in the dam's vicinity. In the first full month of the dam's construction, workers placed 205,000 cubic yards of embankment. Work on both facilities proceeded very well, with only a few shifts lost due to inclement weather.³⁴

Construction on Fort Cobb's facilities proceeded smoothly throughout 1959. The primary contractor, Hyde-Cook, completed all major concrete placement before the end of March. Once finished, Hyde-Cook started closure of the dam's embankment section shortly afterward, completing this on August 7, 1959, allowing the reservoir to continue begin the filling process that began a few months earlier. By mid-November, other major contract items such as electrical installations, bedding and rip-rap placement on the upstream slope, topsoil placement on the downstream slope, grading and surfacing of all access roads, and excavation of surface drainage ditches were completed with model

33. Ibid., 43-65.

34. Ibid., 86-87.

efficiency. On November 16, 1959, the government formally accepted Fort Cobb Dam as complete, at a total cost of \$3,155,572.07—almost \$163,000 under budget—with Hyde-Cook and other subcontractors completing the work in 92 percent of allowable time.³⁵

As Fort Cobb Dam and reservoir neared completion, work commenced on the 20.9 mile long Anadarko Aqueduct. On December 3, 1958, Reclamation opened bids for the aqueduct's construction, and the shorter Western Farmers Electric Cooperative and Fort Cobb laterals under Specifications No. DC-5126. A month later, Reclamation opened bids at the Washita Basin Project Office in Anadarko. The office received twenty-five bids, with a low bid of \$1,372,551.00 submitted by B&M Construction Corporation of Oklahoma City (hereafter B&M), about \$150,000 below engineering estimates. Reclamation awarded contract No. 14-06-D-3127 to B&M on February 9, with the contractor acknowledging the notice to proceed two days later. Specifications allowed 500 days for construction; this established June 25, 1960, as the aqueduct's completion date.³⁶

Almost immediately, B&M issued purchase orders for the gravity flow aqueduct's 30-inch prestressed concrete pipe to the Lock Joint Pipe Company and Thomas Concrete Pipe Company, both of Oklahoma City. Using spinning machines of the Rocla and Cen-Vi-Ro processes, in May 1959 these two companies began manufacturing the aqueduct's pipe. Beginning construction on May 4, 1959, a couple weeks later B&M started trench excavation, pipe installation, and dewatering at intersecting river and stream points; by year's end—and despite rainy, cold weather conditions and excessive groundwater—40

35. *Washita Basin Annual Project History*, Vol. 2, 1959, 15.

36. *Ibid.*, 30.

percent of the aqueduct's contract requirements had been completed in 65 percent of the elapsed time.³⁷

Unlike Fort Cobb Division, where construction proceeded smoothly, all did not proceed so smoothly with Foss Division. Although Wunderlich, the dam's primary contractor, started construction on Foss Dam in late 1958, and made decent progress the first four months of 1959, once late spring arrived so did seasonal deluges. A series of rainstorms in May 1959, including one downpour that delivered over six inches of rain in a single day, hampered construction progress, as did more storms in November and December. Yet when the weather cooperated in the first four months and September and October, Wunderlich excavated ground and poured concrete for the dam's piezometer terminal wells, spillway, river outlet works, municipal outlet works, and canal outlet works (for irrigation facilities that were never constructed). And, when weather allowed, Wunderlich proceeded with placing the dam's embankment. By the soggy year's end, Wunderlich had placed 3,389,228 cubic yards of materials into the dam's embankment.³⁸

Project land acquisition activities also proceeded smoothly in most instances. Reclamation appraised 192 tracts of land and successfully negotiated 138 contracts for the purchase of real property, mostly within the Foss Division, and acquired thirty easement tracts through condemnation. Average cost for fee title lands was \$218 per acre, and \$57.50 per acre for easement condemnations. When it came to acquiring restricted Indian reservation lands, however, Reclamation ran into a roadblock erected by the Anadarko Bureau of Indian Affairs (BIA) office. BIA officials refused to approve, disapprove, or even review Reclamation's land appraisals of these Indian lands, unless

37. Ibid., 30, 119.

38. Ibid., 43-119 *passim*.

the appraisal was accompanied by a land purchase contract executed by all owners. After a conference between Reclamation's Regional Director and commissioners from both agencies, they resolved that BIA would review appraisals prior to negotiations with property owners, and could either approve or disapprove the appraisal, indicating any deficiencies, before contact with property owners.³⁹

1960 witnessed further administration and construction progress, to the point that the annual project history called it a "peak" year. Notable highlights were the shifting of the project office from Anadarko to Clinton, establishment of the Aqueduct Structure Division that contained branches for Foss and Fort Cobb Divisions, and the establishment of a Dam Division, containing the Laboratory and Survey and Inspection branches. Additionally, Reclamation mentioned that as project construction proceeded towards completion, this necessitated closer coordination between the bureau and the two MCDs over water deliverance and usage, along with more coordination between the bureau the National Park Service regarding long-term recreational development and usage at both facilities, and the Oklahoma Wildlife Conservation Commission concerning fish and wildlife protection measures immediately around and upstream from both facilities.⁴⁰

Beyond the first few sodden months of 1960, construction proceeded well on Foss Dam. By May's end, Wunderlich completed concrete placements in the municipal and canal outlet works, as well as the river outlet works except the shaft house intake structure plug, and tested the high pressure gates for the river outlet works. But the big day came on July 19 when the contractor commenced diverting the Washita River through the river outlet works. By year's end, the only work remaining to complete on

39. Ibid., 60-61.

40. *Washita Basin Annual Project History*, Vol. 3, 1960, 3-10. RG 115, Box 187, NARA Denver.

Foss Dam consisted of topping out the earth embankment with riprap and topsoil, shaft house construction, placement of the second stage concrete in the river outlet works intake plug, and related mechanical and electrical installations at this structure. At year's end, contractor earnings tallied to \$7,328,608.20—\$23,000 under budget—which amounted to Wunderlich finishing 93 percent of the work in 72 percent of the allotted contract time.⁴¹

All that remained to construct on Foss Division was the 50-mile-long Foss Aqueduct, a pump-feed conveyance intended to deliver municipal and industrial water from Foss Dam southward to its Hobart terminus, along with three small laterals, the Bessie, Clinton, and Cordell. On June 1, Reclamation opened bids for the buried aqueduct's construction under Specifications No. DC-5300. Vinson Construction Company (hereafter Vinson) of Phoenix, Arizona, submitted a low bid of \$3,826,244.90, almost \$283,000 under original engineering estimates. On June 23, Reclamation awarded Vinson the contract, with notice to proceed received by the contractor on August 1. Although the manufacturing of pipe began eighteen days later, Vinson did not start actual construction on the aqueduct and its laterals until October 20. This was due to the desire by Vinson to stockpile enough pipe to expedite laying and connecting. Because of the late start, little work was accomplished on the aqueduct; however, Reclamation held high hopes the aqueduct's construction would accelerate once sufficient prestressed concrete pipe had been stockpiled.⁴²

Unlike the gravity-feed Anadarko Aqueduct, water delivery with Foss Aqueduct depended on three pumping plants. On September 13 Reclamation opened bids under

41. Ibid., 14.

42. Ibid., 26.

Specification No. DC-5379 for construction of Foss Aqueduct Pumping Plants 1, 2, and 3. Universal Engineers and Constructors, Inc. (hereafter Universal) of Tulsa submitted the low bid of \$299,405, which was \$22,321 above original engineering estimates. On September 30, Reclamation awarded the contract, and Universal received the notice to proceed on October 18. Although little work was performed that year, Reclamation expected construction to reach full steam in during calendar year 1961. Furthermore, Reclamation awarded another contract for construction of the aqueduct's steel water storage tanks to Bering Company (hereafter Bering) of Dallas, Texas. Since Bering did not get notice to proceed until around Thanksgiving, little work other than preparation of shop drawings was accomplished in 1960.⁴³

On the nearly-completed Fort Cobb Division, workers responsible for the laying of Anadarko Aqueduct experienced many weather related difficulties. Similar to what crews experienced in the early 1960 delays on Foss Dam, B&M could not get around the extreme cold and excessive precipitation that hampered construction progress the first three months. Heavy rainfall was especially vexing. Since the aqueduct's placement required several crossings under the Washita River, excess precipitation caused the river to run high, delaying completion of all river crossings. Additionally, high groundwater levels delayed excavation and laying of pipe. By summer, however, work accelerated, resulting in the aqueduct's near-completion by the end of September.⁴⁴ All that remained was construction of a concrete terminal reservoir in Anadarko, slated to begin in 1961.

Foss Reservoir clearing activities also gained steam in 1960. Although this work consisted of routine clearing of trees and brush under standard contracts, one cleanup of

43. Ibid., 28.

44. Ibid., 29.

note regarded the relocation of the Edwardsville Cemetery to a new site in Canute, 14 miles west of Clinton. Since the old cemetery was located on Federal lands, it was Reclamation's responsibility to relocate this cemetery. On June 25, 1960, Reclamation awarded a \$19,492 contract to E.L. Colburn (hereafter Colburn) of Westville, Oklahoma, under Specifications No. 500C-75, with notice to proceed received by Colburn fifteen days later. After preparing the new site, Colburn began disinterment of known graves on July 11, 1960, using a backhoe. When remains were reached, the mortician and Government Inspector oversaw the removal of these remains to new containers, with the inspector completing an individual report and "staking" each container for gravestone identification purposes. A total of 306 known burials were recovered from the old cemetery. A separate crew of two workers using a backhoe took care of reinternments at the new site, then using the stake identification system replaced the old gravestones in new concrete footings. By July 22 all known Edwardsville graves were relocated to the new Canute site.⁴⁵

One day later, Colburn began the arduous, morbid process of searching and removing unmarked and unknown graves, made more complicated by the accumulation of windblown dirt and soil over the previous five decades. Since hand-digging proved futile, workers accomplished this via a series of backhoe trenches three feet wide and four feet deep running from the cemetery's north to south boundaries. The first north-south trench revealed six unmarked and unknown graves, whose remains were disinterred for removal and relocation. This method proved successful, and by July 27 Colburn had identified, removed, and relocated thirty-eight additional unmarked and unknown

45. "Final Construction Report: Edwardsville Cemetery Relocation, Foss Reservoir Area, Washita Basin Project, Oklahoma, Foss Division, Clinton, Oklahoma, April 1961," in RG 115, Box 753, NARA Denver, 2-6.

remains to the Canute site. After workers reset the old gravestones—some which weighed more than 300 pounds—they removed, re-erected, and repainted the original cemetery’s ornamental iron gateway, raked the site, and installed fencing, completing contract work barely six weeks after receiving formal notice to proceed. The final construction report, however, made no mention as to how the unknown and unmarked remains were reinterred.⁴⁶

By the time 1961 arrived, most of Washita Basin Project was completed, with most work remaining in Foss Division. On March 10, Wunderlich finished construction of Foss Dam eight months ahead of schedule, using only 78 percent of the allotted contract time. Final work consisted of completing riprap and topsoil placement on embankments in Zones 1 and 3, and final concrete placement in the river outlet works control house. And on March 28, force account workers placed concrete in the 3 foot-by-3-foot opening in the river outlet works intake structure, and began storing water in Foss Reservoir. Additionally, work began on the construction of recreational facilities around Foss Reservoir, including access roads, boat ramps, fabrication and installation of picnic tables, fireplaces, toilets, and garbage receptacles, followed by the paving of roads, the installation of signs, and other finishing touches. The contractor, Ray Lynch of Oklahoma City, completed all work by October 15.⁴⁷

Progress on Foss Aqueduct and its related appurtenant features also gained steam. On January 4, Vinson began installing the aqueduct’s 10-to-42-inch prestressed concrete piping. Throughout the year, Reclamation lauded Vinson for their “exceptional” progress

46. Ibid., 7-9. According to a project overview by the cultural resource staff at Reclamation’s Oklahoma City Area Office, this was not the first attempt to relocate the graves. From 1959-1960 74 graves from Edwardsville Cemetery were relocated to various area cemeteries.

47. *Washita Basin Annual Project History*, Vol. 4, 1961, 14, 37.

with “adequate” equipment and personnel, and pointed to good coordination between the manufacturing and delivery of equipment to the jobsite, and the efficiency with which workers placed and connected these materials. This efficiency was due to Vinson using two pipe-laying crews, one of which worked behind a Paron 310 trenchliner in drier areas, and the other working from station to station behind a dragline or backhoe used at river crossings or other areas where excess groundwater or unstable banks existed. The placement of compacted bedding, backfill, and earthfill immediately followed the pipe laying crews, while other crews installed corrugated metal pipe casings for highway crossings, erected forms, and placed structural concrete. The only factors that slowed construction were difficulties encountered in stabilizing foundations for underground pipe installation at river crossings. Due to high precipitation and runoff, one Washita River crossing was so waterlogged that after three bank cave-ins and pipe movements, Vinson abandoned all hope to complete the crossing until they finished the rest of the aqueduct.⁴⁸

Construction also accelerated on the three Foss Aqueduct pumping plants. By the end of May Universal had placed the concrete for the floors in plants 2 and 3, and one month later began erecting these pumping plants’ superstructures. Plant 1 lagged behind, not being excavated until June. By July Universal had installed roofs and decking on plants 2 and 3, with both of these plants getting their pumping units installed less than a month later. By October both plants 2 and 3 were essentially finished, only lacking final touches, while plant 1’s pumping apparatus was installed in December. By year’s end, Universal completed just over 72 percent of the work in 48 percent of the allotted time—

48. Ibid., 22.

despite not beginning construction until March 25, five months after official notice to proceed.⁴⁹

Unlike other major Washita Basin Project facilities, affairs did not proceed so smoothly with construction of the Anadarko Aqueduct's concrete terminal reservoir and telemetering system. The contractor, Paramount Construction (hereafter Paramount) of Oklahoma City, started slow then consistently lagged behind schedule. While Paramount acknowledged Reclamation's notice to proceed of December 2, 1960, no field work was performed until late February 1961, with half of the allotted time already expired. After various Orders for Changes and timeline extensions, and after completing 75 percent of the work under Part 1 of the specifications, which included a concrete holding reservoir, concrete and steel piping, and the Anadarko Bifurcation and Western Farmers' Electric Cooperative terminal structures—on August 7 Paramount notified Reclamation of default and their inability to complete the job. Eight days later, Reclamation, through the Surety Standard Accident Insurance Co., brought on a new contractor, Guy James (hereafter Guy James) construction of Oklahoma City to complete Paramount's work. By October 17, Guy James finished all work under Part 1 of the specifications in 132 percent of the allowable time, and by year's end part 2, James installed and tested the 24-by-6-foot compound meter and indicators in the control house. A month later, Reclamation began operational tests of Anadarko Aqueduct and the Western Farmers' Electric Cooperative lateral, and on December 4 the aqueduct began delivering water to the City of Anadarko. Eight days later, on December 12, Western Farmers' Electric Cooperative started receiving Fort Cobb Reservoir water.⁵⁰ So despite contractor default and setbacks—an

49. Ibid., 33.

50. Ibid., 38, 38A.

anomaly in the Washita Basin Project's construction history—the new aqueduct finally delivered.

By December 1962, most of the Washita Basin Project was finished. Now that Fort Cobb Division was complete—and recreationists from Oklahoma and surrounding states were flocking to southwest Oklahoma's latest water-born recreation facility in Fort Cobb Reservoir—the remaining major construction project was Foss Aqueduct. Vinson made excellent progress throughout 1962, completing all work by July 6, 94 days ahead of schedule, and a mere \$7,607 above their bid. Vinson, however, made additional claims for work done on Washita River crossings 1 and 3, claims denied by Reclamation through a finding of fact dated December 3, 1962. In August the first operational tests of Foss Aqueduct and its smaller laterals commenced, and completed by December.⁵¹ However, there were delays in the contractor's required modifications of the electrical, mechanical, and telemetering systems in the aqueduct's three pumping plants; by year's end, while Reclamation reported that 99 percent of the work on these plants had been finished, the agency remained optimistic that the contractor could finish this work in early 1963.⁵²

By 1963's end, Reclamation and the MCDs considered Washita Basin Project completed, save for finishing touches and a minor repairs to both aqueducts' piping and joints. While the project's authorizing act included provisions for storage, regulation, and distribution of irrigation water to 26,000 acres of land downstream from the Foss facility, Reclamation never constructed any project irrigation facilities. This is because the bureau, Foss MCD, and Foss Irrigation District failed to agree on repayment terms to

51. *Washita Basin Annual Project History*, Vol. 5, 1962, 7, 23-4. RG 115, Box 151, NARA Denver.

52. *Ibid.*, 50-51.

build the system slated to irrigate those 26,000 acres. Therefore, the only irrigation features constructed for Washita Basin Project were irrigation outlet works installed at Foss Dam during construction.⁵³

Uses of Project Water

Despite no irrigation facilities, Washita Basin Project water serves many needs, mostly for municipalities and industry, recreation and wildlife management, and flood control. Foss Reservoir water provides municipal and industrial (M&I) water to the communities of Clinton, Bessie, Cordell, and Hobart via the Foss Aqueduct, and Fort Cobb Reservoir provides M&I water to the Cities of Anadarko (the City of Chickasha withdrew from project participation to construct and operate their private Chickasaw Aqueduct), along with the Western Farmers Electric Cooperative and the Public Service Company of Oklahoma, via Anadarko Aqueduct. However, there is discussion about the possibility of expanding Anadarko Aqueduct's capacity in order to meet increasing M&I demands. Additionally, project communities in the Foss Division, through a cooperative effort with the Foss MCD, helped construct a water treatment plant at Foss Reservoir, where the treated water supply is then conveyed to each project town via the aqueduct.⁵⁴ This M&I water delivery is a very important factor in the history of project-sponsored cities and towns, for before the project was built, dependable water supplies, both for industrial and potable use, were virtually non-existent.

53. U.S. Bureau of Reclamation, Southwest Region, *Revised Draft Environmental Assessment, Safety of Dams - Foss Dam, Foss Division, Washita Basin Project, Oklahoma*. December 1986, p. I-2.

54. Bureau of Reclamation, Oklahoma-Texas Area Office, *Concluding Appraisal Report: Conveyance System Expansion, Fort Cobb Division, Washita Basin Project, Oklahoma*. December 2006, 2. Although Reclamation investigated the possibility of replacing Anadarko Aqueduct to meet increasing M&I demands, this was rejected because the aqueduct is in very good condition for its age.

Recreation and fish and wildlife conservation serve important purposes for both facilities. Fort Cobb Reservoir provides over 2,000 acres of land and 2,300 acres of water surface area for recreation, and includes 1,800 acres of land and 1,800 acres of water surface area for fish and wildlife management. The Oklahoma Tourism and Recreation Department administers the recreation areas, while the Oklahoma Department of Wildlife Conservation oversees wildlife and fish management. Since Fort Cobb Reservoir releases are primarily to address M&I demands and flood control, the reservoir does not normally experience drastic drawdowns. Same is true with Foss Reservoir, which provides 1,500 acres of land and over 5,000 acres of water surface for recreation purposes, and nearly 4,500 acres of land and over 3,700 acres of water surface for management within the Washita National Wildlife Refuge. Like Fort Cobb, recreation at Foss is managed by the Oklahoma Tourism and Recreation Department, while the refuge is administered by the U.S. Fish and Wildlife Service. Additionally, the State of Oklahoma established Foss State Park and Fort Cobb State Park to enhance outdoor recreation possibilities at both facilities.⁵⁵

Yet it is the flood control aspect that provides the greatest benefit. The long, narrow Washita River Basin flows from northwest to southeast, perpendicular to the axis of most major storm fronts. The basin's shape and orientation results in the generation of damaging water flows, and it is not unusual for several consecutive flood crests to follow each other within a short period; the 1934 Hammon flood is a good example. Flood control operations at Foss and Fort Cobb provide invaluable flood control benefits to downstream areas previously subjected to flood damage. These operations rely on close coordination among Reclamation, the MCDs, and the Army Corps of Engineers. It is

55. Bureau of Reclamation *Dataweb* <http://www.usbr.gov/dataweb/html/washita.html>

calculated that from 1950 to 1999 the project provided an accumulated \$11,572,000 in flood control benefits.⁵⁶

Conclusion

Like other Federally-sponsored water projects in the American West—Reclamation's Palmetto Bend Project in southeastern Texas is a good example—the Washita Basin Project arose out of basic human needs exacerbated by two natural disasters.⁵⁷ Although shelved as a possible project by Reclamation in the early years of the twentieth century, then ignored for three decades, it took an extended intense drought and a catastrophic flash flood to set a sequence of events into motion that resulted in the project's investigation, authorization, construction, and operation. That the Washita Basin Project has provided an abundance of benefits for area residents and businesses over the last five decades is obvious. The flood control benefits, however, are especially cherished by residents who not only live and/or work next to the river, but by those who have experienced the fury of a uncontrolled high plains river as it wreaked horrific havoc upon lives and property.

56. Ibid.

57. Palmetto Bend Project, near Edna, Texas, came about as a result of Hurricane Carla causing millions of dollars in property damage in 1961, although no lives were lost. See Bureau of Reclamation *Dataweb* <http://www.usbr.gov/dataweb/html/palmetto.html>

Bibliography

Manuscript and Archival

Record Group 115, Records of the Bureau of Reclamation, National Archives and Records Administration, Denver, Colorado. *Annual Project History, Washita Basin Project*, Vols. 1-13, 1958-1983. Engineering and Research Center Project Histories.

_____. "Final Construction Report: Edwardsville Cemetery Relocation, Foss Reservoir Area, Washita Basin Project, Oklahoma, Foss Division." April 1961. Project Reports 1910-1995.

Government Documents

United States Department of the Interior, Bureau of Reclamation. "Preliminary Geological Report: Foss Dam Site." November 1946.

_____. "Preliminary Geological Report: Fort Cobb Dam Site." December 1946.

_____. *Rough Preliminary Design and Estimates for a Composite Earth and Concrete Dam at Fort Cobb Damsite, Washita Project, Oklahoma*. Denver: Branch of Design and Construction, Dams Division Report No. 49-43, July 11, 1949.

_____. *Plan of Improvement for Washita River Sub-Basin, Red River Basin, Oklahoma and Texas*. Project Planning Report No. 5-13.02.0. February 1951.

_____. *Fort Cobb Dam: Technical Record of Design and Construction*. Denver: USDOI Bureau of Reclamation, August 1963.

_____. *Foss Aqueduct: Technical Record of Design and Construction*. Denver: USDOI Bureau of Reclamation, March 1965.

_____. *Seed Report on Fort Cobb Dam, Washita Basin Project, Oklahoma*. Denver: Division of Dam Safety, July 1985.

_____. *Revised Draft Environmental Assessment, Safety of Dams—Foss Dam, Foss Division—Washita Basin Project, Oklahoma*. Amarillo, Southwest Regional Office, September 1986.

_____. *Concluding Appraisal Report: Conveyance System Expansion, Fort Cobb Division, Washita Basin Project, Oklahoma*. Austin: Oklahoma-Texas Area Office, December 2006.

U.S. Department of the Interior, Water and Power Resources Services, *Project Data*. Washington, D.C.: GPO, 1981.

U.S. House of Representatives. *A Report on a Plan of Improvement for Washita River Subbasin, Red River Basin, Okla. and Tex., Pursuant to Section 9(a) of the Reclamation Project Act of 1939 (53 stat. 1187)*. 83rd Cong., 1st Sess., 1965. H. Doc. 219.

U. S. Senate, Committee on Interior and Insular Affairs, Subcommittee on Irrigation and Reclamation. *A Bill to Authorize the Secretary of the Interior to Construct, Operate, and Maintain the Washita River Basin Reclamation Project, Oklahoma, Hearings on S.180.* 84th Cong., 1st Sess., April 25, 1955.

Secondary

DeMallie, Raymond J. vol. ed., *The Handbook of North American Indians, Volume 13, Great Plains.* Washington, D.C., Smithsonian Institution, 2001.

Hutton, Paul Andrew, ed., *The Custer Reader.* Lincoln: University. of Nebraska Press, 1992.

Lamar, Howard R., ed., *The New Encyclopedia of the American West.* New Haven: Yale University. Press, 1998.

Morris, John, et. al., *Historical Atlas of Oklahoma,* (2nd ed. rev.) Norman: University. of Oklahoma Press, 1976.

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