W. C. Austin Project

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1994

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The W. C. Austin Project

Dams begin as concepts, but it takes talent only a few possess to convince others to bring those abstractions to reality. Those who browbeat or begged Washington into watering their little corner of the West were often driven by self-promotion and profit, but one of the more altruistic quests was led by Judge W.C. Austin of Altus, Oklahoma. A sober gaze framed by a pair of rimless glasses masked the intensity he brought to his search for irrigated water for Southwest Oklahoma. During a decade of writing letters, sending telegrams and participating in one-on-one meetings with anyone who would listen, W.C. Austin led the charge to control the waters of the North Fork of the Red River. In the pantheon of the persistent, William Claude Austin stands at the front of the hall.

The Project bearing the name of this small-town jurist carries a roll-call of honors and firsts that reads like the back of an All-Star's baseball card: first federal dam built in Oklahoma, known by three different names during its existence (Lugert-Altus, Altus, and W.C. Austin), the last masonry dam built by Reclamation, and the Bureau's eastern-most dam in a sub-humid zone. Currently, the Project provides, since the late 1940s, municipal water for the City of Altus, recreational facilities, flood control, and irrigation water for 46,777 acres.

Both pioneer and civilizer, the actions of Austin's life mirrored the twentieth century West as it shed the wild and wooly for the safe and stable. A generation after the days of the "Sooners," just as the people of Oklahoma thought they had deeply planted the roots of civilization, nature came undone. In the 1930s, millions of acres of blowing topsoil and endless dry summers forced the migration of thousands of Oklahomans. The situation called for both the persistent and the technical to work together to stop a modern day exodus.

Project Location

Southwestern Oklahoma is on the far western edge of a climatological strip of sub-humid climate extending from the Canadian border to the Gulf of Mexico. However, for farmers this point east of the ninety-seventh meridian sees too few downpours and too many months of

drought. Average annual rainfall is 26 inches; better than the 13 to 20 inches of rain sprinkling the high plains of Colorado and New Mexico to the West, but much less than the 35 to 45 inches falling on Eastern Oklahoma. In most places in the West watered by Reclamation, 26 inches would amount to a few years' worth of rain, but at Altus, storms are haphazard and the heat quickly evaporates any moisture. Often, a seemingly interminable July and August diminishes the yield and limits the quality of the harvest, preventing any diversification of crops. Dark plains soils first supported native vegetation like bluestem and buffalo grasses before the land was converted over to cotton. The lengthy growing season of 225 days is due partly to Southwest Oklahoma's low altitude of 1,250 to 1,500 feet above sea level.[1]

The North Fork of the Red River is a fabled and capricious source of water. Early settlers favored some sort of management of the river to prevent sudden flash floods. In the spring and autumn, peak flows running as high as 30,000 cubic feet per second (cfs) have wiped out adjoining fields and towns. The W.C. Austin Project covers most of the 778 square miles of Jackson County, while touching neighboring Greer and Kiowa Counties. Project lands are bounded on the west by the Red River's Salt Fork and on the east by the North Fork. The Altus Dam sits on the North Fork, 18 miles north of the City of Altus. In addition to the dam, other features include the reservoir, Lake Altus, five earthen dikes surrounding the lake's perimeter, and four canals totaling 52 miles in length teamed with approximately 220 miles of laterals. Scattered throughout the canal system are a number of checks, turnouts, siphons, drops and bridges.[2]

Historic Setting

The wave of humanity that peopled the western half of the continent during the mid-nineteenth century took a little longer to blow into Oklahoma. A buffalo hunter named Frazier was the first white settler in the Project area in the 1870s, however the decimation of the herds

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1. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Altus Project*, Vol. 1, 1940-1, 17; Preston George, "The W. C. Austin Plan – Part 3, Problems of Operating an Irrigation Project in a Sub-Humid Area," in *The Reclamation Era*, (July, 1950): 136.
2. Wayne S. Byrne, "Masonry-Faced Dam – First Stage of Altus Dam Completed," in *Western Construction News*, (May, 1944): 63.

soon put his line of work in jeopardy. Frazier's decision to set up shop on this spot soon grew into a small community along the Bitter Creek. In 1891, floods drove settlers to an elevated location two miles east of the creek. Someone in the group with a knowledge of Latin christened the new town, Altus, commemorating the decision to move to higher ground.[3]

As more settlers entered this region, they found themselves geographically and politically in the middle of a land dispute between the State of Texas and Oklahoma Territory. The Texas legislature in 1886 established the North Fork of the Red River as the border between Texas and Oklahoma. The contested area, known as Greer County, was a part of Texas for the next ten years. The feud went all the way to the United States Supreme Court before the justices determined Greer County to be Oklahoma's. The present-day Oklahoma counties of Jackson, Greer, and Harmon were formed from this one-time chunk of Texas.

In 1897, Congress opened Jackson County to homesteaders after passing a special act protecting the rights of earlier settlers. Before the measure, over population was not a problem, as the region's grasslands mainly fed passing herds of cattle. By the turn of the century, fifty-one percent of future project lands were settled in farms averaging 160 acres. Settlement continued over the next twenty years until almost all the arable land in the county was under cultivation. W.C. Austin and his wife, Lillie, were part of this migration, arriving in neighboring Greer County by wagon in 1901. As Southwest Oklahoma's only good sized town, turn-of-the-century Altus had not yet been touched by rail lines, telephones, and electricity. The nearest connection to the outside world was the railstop at Vernon, Texas, – 55 miles by wagon.[4]

Born in Arkansas in 1880, W. C. Austin was the fourth child in a family of six. As a young man, Austin worked in the cotton fields and molasses mills of northeast Texas for sixty-five cents a day while studying the law. Eventually moving to Altus in 1926, he held office as a state senator, member of the state planning and resources board, and president of the Oklahoma

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3. Francis L., and Roberta B. Fugate, *Roadside History of Oklahoma*, (Missoula, Montana.: Mountain Press Publishing Co., 1991), 417.
4. U.S., Department of Interior, Bureau of Reclamation, *Effect of the Introduction of Irrigation on the Rural and Urban Economy of a Subhumid Area W.C. Austin Project, Oklahoma*, (June, 1953), 13; *Altus Times-Democrat*, 7 October 1946, p. 1.

Reclamation Association. Almost a third of the last ten years of his life were dedicated to completing the project. He received no money for the daily telephone calls and letters, and he often paid his own way for trips to Washington, D.C., speaking with anyone who would listen about bringing irrigation to Altus.[5]

In 1902, the seed of irrigation was planted by two Altus merchants, J. A. Walker and Robert Dunlap, and a local pioneer irrigator, W. L. Fullerton. Fullerton and Dunlap went to an irrigation congress in Seattle hosted by the recently minted United States Reclamation Service (USRS), where "so loud was the noise" made by the duo, the Bureau quickly sent a man to check irrigation possibilities in the Altus region.[6]

A USRS engineer, J. G. Camp, came to Altus loaded down with equipment to test the flow of the North Fork. A few days into his survey, he believed a cut in the Wichita Mountain range in northeast Jackson County held the greatest potential for a damsite. The weather that spring eventually dampened Camp's opinion, as often he would set up his instruments to test the stream only to have a flood wash his tools, and once, one of his surveyors, downstream. In disgust, he told locals "what this ---- country needs is a little flood control, not irrigation."[7]

The Reclamation Service conducted two surveys of the area during the first five years of its existence. Those with a financial state in selling land opposed both the 1902 and 1904 USRS studies. Many Oklahoma land agent believed those areas far away from irrigation sources would not be as valuable as those nearest to canals and laterals. For anyone serious enough to make a go of it, farming was a difficult life in turn-of-the-century Altus. A farmer's life was filled with "days of prairie fires, drought, and flood -- days when we met at the community church to pray for rain, or perhaps, to pray for it to cease raining." In the face of those conditions, three federal authorities -- the USRS/Bureau of Reclamation, the U.S. Army Corps of Engineers, and the War Department – all managed studies over the next three decades, but with no tangible results.[8]

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5. Monroe Billington, "W. C. Austin: Pioneer and Public Servant," in *The Chronicles of Oklahoma*, (Spring, 1953): 66, 75.
6. Altus Chamber of Commerce, *Altus, The Irrigation Pioneer of Oklahoma*, (September, 1947), 8.
7. *Altus, The Irrigation Pioneer of Oklahoma*, 10.
8. *Altus, The Irrigation Pioneer of Oklahoma*, 7; Joe Zinn, "The W. C. Austin Plan -- Part 4, Experiences of a Dry-Land Farmer Turned Irrigationist," in *The Reclamation Era*, (August, 1950): 158.

Eventually, federal inertia exasperated the citizens of Altus so much they went and built their own dam. The City of Altus completed a 46-foot high Ambursen dam for municipal use in 1927. The Ambursen Dam Co. of New York City held the patent on a concrete and buttress design found mainly in the Eastern United States. Soon after Altus Dam went into service, a group of farmers met with city officials seeking to divert water from the city's main pipeline for irrigation. Their success sparked discussion of creating an irrigation district, but service from the city was as far as they got. In the 1920s, few dams in the West could boast of an Ambursen design, but the city neglected to note the quantity of silt carried by the North Fork into the reservoir. Seventeen years later as the dam was torn down to make way for a new facility, Lake Altus had been "rendered practically useless" by mounds of silt which reduced its storage capacity from 13,000 to 700 acre feet.[9]

Jackson County was the biggest cotton-producing county in the world in the 1920s. An average of 92,000 bales were produced and ginned annually over a five year period from 1924 to 1929. Three-fourths of its arable land was covered in white bolls, as cotton production accounted for 80 percent of the county's total agriculture revenue. Almost everyone in the county depended on a bumper crop. Growers, ginners, compressors, cotton seed oil mill operators, and marketers all had a stake in its success. A few farsighted growers wanted to ensure and expand cotton's profitability with irrigation. Believers cited cotton's success in New Mexico on Reclamation's Rio Grande and Carlsbad Projects. Unfortunately, the conversion from dry land farming to irrigation did not come soon enough to avoid the onset of the dry, "dirty thirties."[10]

Oklahoma was neither doing fine nor "OK" in the 1930s. Ironically, the dust storms blowing through the state cast the national spotlight on a group possessing "not quite the twang of the Midwest nor the drawl of the Deep South, but a composite of both" -- the rural poor of the Southwest United States. Foreclosure and bankruptcy, over-dependency on cotton production,

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9. "Masonry-Faced Dam – First Stage of Altus Dam Completed," 64; *Altus, The Irrigation Pioneer of Oklahoma*, 10-1.
10. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Altus Project*, Vol. 2, 1942, 15; U.S., Department of Agriculture, *Report on the Altus Project - Oklahoma*, March, 1939, 1, 14, 16-7.

jobs lost to farm mechanization, mounting disillusionment pushed 440,000 people out of Oklahoma; almost 18.4 percent of its population in 1930. It was the greatest out-migration of any state during the depression. The population of Jackson County alone decreased by 6,000 during the decade. By the mid-thirties, even the most orthodox dry land farmer began to see irrigation as the county's last hope.[11]

On a hot summer day in 1935, a quartet of Altus' leading citizens met with W. C. Austin in the lobby of the National Bank of Commerce to explore how to entice the federal government into constructing a dam and reservoir. Austin listened and agreed to organize local support and make contacts with state and Federal officials. For the next decade, Austin politely and persistently stated his region's case to the federal government. Able to couch his concern in courteous language in late 1938, Austin wrote to Reclamation's Chief Engineer R. F. Walter about Jackson County's desperation: "The drought conditions here are continuing and the people feel that upon this project rests the substantial future of this community."[12]

Project Authorization

At Oklahoma Senator Elmer Thomas' suggestion, Judge Austin visited Washington, D.C., in February, 1937, attempting to sway the federal government to start another survey. Austin's efforts paid off later that month, when as President Franklin D. Roosevelt directed $30,000 from the Reclamation fund be made available toward a study of the North Fork. This report, incorporating information from both Reclamation and the Army Corps of Engineers, was published a year later as Senate Document No. 153 of the 75th Session. Lobbying by Oklahoma's representatives in Congress resulted in the inclusion of the "Lugert-Altus Project" in the Rivers and Harbors Act of June 28, 1938 (52 Stat. 1215, 1219). In March 1940, a vote by land owners who had previously pledged to join any future project, created the Lugert-Altus Irrigation District. Voters also ejected dry land farmer Joe Zinn president of the irrigation

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11. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, W. C. Austin Project*, Vol. 1, 1940-1, 17; U.S., House of Representatives, *Interstate Migration*, House Report 369, 77th Congress, (Washington, D.C., 1941), 320-1; James N. Gregory, *American Exodus: The Dust Bowl Migration and Okie Culture in California*, (New York: Oxford University Press, 1989), 3.
12. U.S., Department of Interior, Bureau of Reclamation, Record Group 115, Box 45, letter from W. C. Austin to R. F. Walter, November 1, 1938; *Altus, Irrigation Pioneer of Oklahoma*, 10-1.

district. Zinn, and two other elected board members, now had the legal power to make contracts with the Bureau. Seed money was planted two months later with an initial allocation of $500,000 included in the Interior Department Appropriation Act of 1940.[13]

Although the project had yet to be signed into law by the President, work began on a number of pre-construction tasks. Assigned as the Construction Engineer for Lugert-Altus, Russell S. Lieurance arrived in the town of Altus on May 31, 1940, to coordinate preliminary construction. This included the building of a sand processing plant, field laboratory, and test drilling of the bedrock at the existing Altus Dam. These first months went smoothly according to Lieurance, thanks to the lack of a "holier than thou attitude" by officials of the Works Progress Administration (WPA) responsible for supplying the labor. By October, there were approximately 300 WPA hires working on the project.[14]

A January 21, 1941 letter from Secretary of the Interior Harold Ickes to President Roosevelt illustrates Ickes favorable attitude toward the Altus Project. Ickes believed few newcomers would homestead Altus, but "Any advantage to be derived would come through increased production." After three years of incessant studies and a slowly-paced pre-construction period, Lugert-Altus was finally deemed official by President Roosevelt on February 13, 1941. Later that spring, Lieurance entered the Armed Forces, and Howard E. Robbins assumed the duties of Construction Engineer on August 1, a job he would hold over the next six years. The work began in earnest on April 21, 1941, with the excavation of a dike and the relocation of Oklahoma State Highway 44. Both operations were necessary in order to increase the existing reservoir's capacity.[15]

Construction History

In abstract terms, the 110 foot high Altus Dam looks like a block of concrete sandwiched

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13. U.S., Department of Interior, Bureau of Reclamation, *Report on Altus Project of the Bureau of Reclamation*, (1942), 1; Monroe Billington, "W. C. Austin Irrigation Project," in *The Chronicles of Oklahoma*, (Summer 1952): 208. Lugert is a small town on the southeast corner of Lake Altus.
14. U.S., Department of Interior, Bureau of Reclamation, Record Group 115, (hereafter referred to as RG 115), *Engineering Correspondence*, Box 53, October 12, 1940 letter from R. S. Lieurance to S. O. Harper; Billington, "W. C. Austin Irrigation Project," 208.
15. *Report on Altus Project of the Bureau of Reclamation*, 2; U.S., Department of Interior, Bureau of Reclamation, *The W. C. Austin Irrigation Project Historic Inventory Report*, (Denver: June, 1993), 10; *Altus, The Irrigation Pioneer*, 11.

by two slabs of rock. However, its unique face is a monument to surmounting the scarcities and sacrifices of the manpower and material-short war years. Built on the foundation of the old Altus Dam, the new concrete gravity, partially curved dam is 1,104 feet long with a 10 foot wide crest. Incorporated within the structure works are controlled and uncontrolled spillways and a canal outlet works. The uncontrolled spillway section is 114.5 feet wide while the controlled portion is regulated by nine radial gates 21 feet wide by 15 feet high. The canal outlet works is made up of three conduits, 72 inches in diameter, each controlled by one 5-by-5-foot hydraulically operated high-pressure slide gate.[16]

Before the dam took shape, enlarging the existing reservoir was first on the schedule. Creating extra room required relocation of highways, a railroad line, and bridges that would have been washed out if they had not been moved. A portion of Oklahoma State Highway 44 south of the reservoir was redirected along with a section of the Atchinson, Topeka & Santa Fe (A.T.& S.F.) rail line. Bridges along State Highway 9, and the Chicago, Rock Island & Pacific track (C.R.I. & P.) along the north of the reservoir, were raised 13 feet to make way for a higher water level and the construction of five dikes surrounding the edge of the reservoir. The relocation of Highway 44 took 11 months to finish. Work on Highway 9 and the C.R.I.& P. was curtailed in 1941 by America's entry into World War II. It took four years before both jobs were totally completed in November 1945.[17]

The remodeled Lake Altus can hold 152,482 acre feet of water. Of that amount, 132,886 acre feet goes to conservation storage; 19,596 acre feet is for flood control storage, 10,000 acre feet is reserved for municipal water, and the remaining 1,663 acre feet is dead storage. Five earthfill dikes equipped with toe drains were constructed along the lake's perimeter in low lying areas. Each was finished with either riprap or gravel.[18] All of the following embankment dimensions are in feet:

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16. U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Altus Dam*, (Denver: 1982), 1.
17. "Masonry-Faced Dam – First Stage of Altus Completed," 63; *Altus Project, Annual Project History*, Vol. 2, 1942, 25.
18. George, "The W. C. Austin Plan – Part 3, Problems of Operating an Irrigation Project in a Sub-Humid Area," 136; *SEED Report on Altus Dam*, 1.

	Lugert Dike	East Dike	South Dike	North Dike	Auxiliary Dike
Height	47	27	35	27	23
Crest length	6,000	10,344	330	1,027	1,180
Crest width	24	24	34	24	20-24
Maximum base width	223.75	126	199	138.75	----

(Source: U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Altus Dam*, Denver: 1982, 26).

Originally built for, and occupied by Civilian Conservation Corps (CCC) enrollees, the workers camp had been abandoned for over a year before it was released to Reclamation on September 13, 1940. A WPA crew repaired and reconditioned the camp in anticipation of the arrival of hundreds of project workers. Reclamation predicted there would be an average of 500 jobs with a possible 900 to 1,000 openings during full construction. The expectation that Altus would require 2.5 million man hours of work never materialized, as the largest number of workers hired during the four year construction period was 365 in 1941-2.[19]

Many of those men in 1941-42 removed the old dam's downstream apron and buttress as part of the reservoir's expansion. The new dam's upstream face was designed 24 inches downstream from and parallel to the spillway crest of the original Altus Dam. Demolition began with line drilling and placement of shots of dynamite and black powder, but these methods proved to be too slow and costly. Drop hammers and other heavy steel objects attached to a crane were tried, but the machine slid off the apron's slope endangering the crane's boom. A worn granite rock attached to the crane's drop cable finally cracked the concrete. The "stone hammer" was so precise in its method of destruction that over 40,000 lbs. of precious reinforcing steel in the apron slabs were reused in the new dam.

As the old dam began to crumble, a new difficulty arose over what to do with 14,000 cubic yards of silt. When the dam's sluice gates were opened, the area downstream was soon covered in silt 50 feet deep in some places. Silt removal began with the use of draglines followed by a pumper mounted on a barge pushing the trapped mud, sand and water into the river. Finally, blasts from high pressure air-water jets dispersed the remaining sediment. As

19. RG 115, *Photo Album, Altus Project*, Box 7; RG 115, General Correspondence File, Box 53, File 1025; U.S., Department of Interior, Bureau of Reclamation, The W. C. Austin Irrigation Project Historic Inventory Report, 66.

these operations progressed, the river was diverted through a channel in the canal outlet works located in the dam's left abutment to a point 500 feet downstream. The old dam served as the upstream cofferdam, while the downstream cofferdam was formed of earth and rockfill.[20]

The last masonry dam built by the Bureau began as rock blasted from the base of Rattlesnake Mountain. Reclamation's decision to build an all-masonry dam was meant to have created jobs for out-of-work Oklahomans and decrease the amount local district water users would have to pay back to the federal government. Masonry as the dam material of preference had been superseded by concrete some 25 years earlier. On the last dam built by Reclamation, Arizona's Theodore Roosevelt, craftsmen were imported from Italy to fashion its striking facade. However at Altus, WPA employees from Oklahoma used hand sets and chisels to cut and shape the granite. The process began with large stones weighing up to 100 tons fractured by jackhammers into smaller boulders. Drilling further reduced the stones, as any remaining granite too small for squaring into blocks was crushed for later use as concrete. The blocks -- averaging two to four cubic yards each -- were loaded on to trailers and shipped to a storage yard at the bottom of the hillside. From there, a total of 300,000 cubic yards of masonry were hauled to the damsite.[21]

Eight months into quarrying, by November 1941, Reclamation realized mounting costs, and scarcity of men skilled enough to cut rock, meant a switch from an all-masonry design to a dam with a concrete core. Fourteen-thousand cubic yards of cut granite blocks stored at the quarry would be now used in the facing and parapet walls. The addition of a concrete core did not mean the dam would be solid concrete. The dam's center is comprised of a lean mixture made of 30 percent pumicite, a lighter material with a similar texture to cement. The pumicite was mined from a pit 17 miles from the dam.[22]

The first full year of World War II brought the world to Altus, and shortages of men and material would plague the project for the duration. In May, 1942, the War Department

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20. "Masonry-Faced Dam – First Stage of Altus Dam Completed," 64-5; *SEED Report on Altus Dam*, 28.
21. Annual Project History, Vol. 1, 1940-1, 35.
22. "Masonry-Faced Dam – First Stage of Altus Dam Completed," 64.

announced its intention to build a twin-engine plane flying school (later known as the Altus Army Air Field) northeast of the city. The school's arrival prompted the Bureau, at the request of the city, to apply for a priority rating on materials to complete the reservoir. By August, the War Production Board (WPB) assigned an A-1-C priority rating allowing partial construction of the dam in order to serve the city and the air field.[23]

Receiving a priority rating did not ensure everything and everybody involved in keeping the project running would be readily available. A shortage of tires and repair parts meant costlier replacement equipment and a greater reliance on substitutes for metal spare parts. By the early summer of 1942, truck tires were so rare, an average of only two dump trucks were in use. Tires and parts were not the only commodity in demand, as people were needed to work in the cotton fields and on construction at the nearby air field. Both demands drained the remaining WPA forces to a handful. On October 15, the long anticipated federal liquidation of the WPA was announced, leaving those hired by the Bureau to continue. During September and October, the possibility of bringing Japanese-Americans from the West Coast to supplement the loss of WPA laborers was discussed. The arrival of these "Japanese labor battalions" was supported by many in Jackson County, but their transportation from the West Coast was eventually seen by the federal government as impractical. Months of concern over where to find laborers came to a head on December 12, when the War Production Board (WPB) in Washington issued a "Stop Construction Order" limiting the dam's future purpose to providing water for the city and the Altus Army Air Field.[24]

When the stop order went into effect, 50 percent of the dams and dikes were complete; all the earth dikes were done, and the relocation of the A.T.& S.F. railway and State Highway 9 had been accomplished. The WPB's "low-stage development" schedule meant the dam's height would be 20 feet below the initial design, eliminating the use of materials for the war effort. Those closely involved with the project saw the WPB order as a set-back that revised their main

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23. *Ibid*., 64.
24. *Annual Project History, Altus Project*, Vol. 2, 1942, 40; RG 115, *General Correspondence*, letter from Walker R. Young to H. E. Robbins, October 20, 1942, Box 46.

objective – water for farmer's fields. A year-and-a-half long sales job by Reclamation Commissioner Harry W. Bashore, Construction Engineer Robbins, Director of the State Division of Water Resources Don McBride and Judge Austin inevitably wore down the WPB. In April of 1944, the WPB was won over, classifying Altus Dam as a War Food Project. This classification meant completion of Altus was vital for war-time production of food and fiber. Despite the sense of renewed importance resultant from the classification, for the rest of construction engineers and laborers still had to have to make due with equipment breakdowns, spotty delivery of lumber and reinforcing steel and a lack of spare parts.[25]

The last cubic yard of concrete was poured to complete the spillway crest in the summer of 1945. The project was finished except for installation of the radial gates and permanent spillway bridge. Reclamation entered into a series of contacts with private firms to dig the laterals and complete reconstruction of State Highway 9. Much of the delivery system remained to be finished, but construction of "Oklahoma's first irrigation project" was far enough along that a tour of the facilities was conducted on January 30, 1946. Judge Austin and Howard Robbins hosted several hundred people as they viewed the dam and dikes and were told about irrigation and its importance to Oklahoma in the future. The first section of canal was achieved April 30, 1946. Austin was back again six months later on June 19, as the first delivery made its way to the northern end of the project. The beginning of operations would be the last aspect of the Altus Project Austin would be involved with as a prolonged illness took his life on October 5, 1946.

Life and the project went on, and a year later the City of Altus threw itself a party in honor of the new dam. Three days of parades and celebrations culminated in Dedication Day, Friday, September 5, 1947. It was a 110 degrees in the shade that afternoon with the only relief provided by "parasols and newspapers." Secretary of the Interior Julius "Cap" Krug, and Oklahoma Governor Roy Turner, were not much better off sitting for two hours of speech

25. Billington, "W. C. Austin Irrigation Project," 210; *SEED Report on Altus Dam*, 28.

making under the grandstand's sheet-iron roof.[26]

Construction of the distribution systems was done by 1949, while open surface and subsurface drains were in operation four years later. The Main Canal has a capacity of 1,000 cubic feet per second (cfs) and transports water 4.2 miles from Altus Dam to the project's northern boundary. The canal crosses the North Fork by means of a 10-foot, 3-inch-diameter siphon, 1,920 feet long. The lower end of the Main Canal delivers water to the principal canals of the project's 270 mile distribution system. These channels vary in capacity from 710 cfs at the head of the Altus Canal down to a few cfs in the smallest lateral. Only a few sections of canal are concrete, as the majority remains unlined. The terminus of the Main Canal branches off into the 21.7 mile Altus Canal and the 11 mile long West Canal, both serving the main delivery system. The 14.8-mile Ozark Canal branches off from the Altus Canal. The canals and laterals can be used for drainage if rainfall is too plentiful or a flash flood occurs. A contract between the federal government and the City of Altus provides water from the reservoir for the municipality.[27]

The final tribute to the man who redirected the agricultural fortunes of Southwest Oklahoma originated when Senator Thomas and Congressman Preston Peden introduced legislation in Congress to name the Altus Project after W.C. Austin. The Eightieth Congress passed Public Law 69 and President Harry S. Truman signed the measure on May 16, 1947. The W.C. Austin Project's final price tag was $12.8 million, of which $8 million came from the WPA and other non-reimbursable funding. The water users' repayment obligation barely topped $3 million, with irrigable owing $2 million, and the city of Altus paying $1 million for the upgrading of their municipal water supply. Project water users were charged slightly more than $1.00 per acre per year over a forty year repayment period. By 1990, rural water users retired the $2 million debt. Enduring longer than a repayment schedule, a plaque set into a block of granite at the damsite remembers Austin's endeavors as an individual, "who asked as his reward

26. "Short Grass Salvation," in *Time*, (September 15, 1947): 24; *Altus Times-Democrat*, 6 October 1946, p. 1.
27. *Effect of the Introduction of Irrigation on the Rural and Urban Economy of a Subhumid Area W.C. Austin Project, Oklahoma*, 8; U.S., Department of Interior, Bureau of Reclamation, *Project Data*, (Denver: 1981), 1299; "W. C. Austin Irrigation Project", 212.

for accomplishment only another chance to serve."[28]

Post Construction History

World War II had just ended, but the cotton country surrounding Altus looked much as it did when it was first settled. A characteristic Jackson County homestead was a ramshackle two-room frame house and a barn with the siding and roof missing. With a little lumber and a paint job, this piece of farm property would soon serve as a testing ground to illustrate the benefits irrigation would bring to the region. The Bureau's 58-acre demonstration farm was co-sponsored by the Soil Conservation Service and Oklahoma State College to help introduce irrigation practices to farmers experienced only in dry land methods.

As soon as the first gate was lifted, irrigation took off like a prairie wind storm within the next two years. Eleven farmers watered 510 acres in the northern end of the project in 1946. That year, an average return on an acre of irrigated land was $130, versus $22 an acre for non-irrigated land. A year later, 3,200 acres on 60 farms were watered. The difference managed water made was visible at harvest-time, as cotton stood five feet high and was loaded with bolls. On non-irrigated land, plants grew only to two feet and was "barely worth picking." A half decade after Altus' completion, yields of alfalfa and cotton doubled and trebled on some farms.[29]

The operation and maintenance responsibilities for the project distribution system were transferred from Reclamation to the Lugert-Altus Irrigation District on October 1, 1952. Reclamation retains ownership of the dam, reservoir and main canals. The Lugert-Altus District built an additional 34 miles of open drains in the nearby Bitter and Stinking Creeks. The only notable maintenance has been weed control, replacement of the turnout gates and grouting program to combat seepage along the dikes in the 1980s. An examination by the Bureau in the early 1980s found the dam and reservoir to be in satisfactory shape.[30]

Settlement of the Project

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28. "W. C. Austin Irrigation Project," 211; U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, W.C. Austin Project*, Vol. 7, 1947, ii; U.S., Department of Interior, Bureau of Reclamation, *Effect of the Introduction of Irrigation on the Rural and Urban Economy of a Subhumid Area W. C. Austin Project, Oklahoma*, (June, 1953), 12.
29. *Altus, The Irrigation Pioneer of Oklahoma*, 9; "Short Grass Salvation, 24.
30. *SEED Report on Altus Dam*, 29-30.

Bryce Henderson was a hand-picked pioneer. The returning Navy pilot's homecoming was capped off when Reclamation awarded him the demonstration farm. The farm was designed to be a working symbol of what irrigation could bring to the farmers of Jackson County. In Henderson's first season of 1946, he grew oats, alfalfa, corn and winter wheat and 14 varieties of cotton. The demonstration farm was a beachhead against the County's economic and social status quo. Before and immediately after the war, 75 percent of project landowners were not living on, or personally operating their farms. Fifty percent of those absentee owners were businessmen living in town while their property was operated by tenants or sharecroppers. Twenty-five percent of those absentee owners lived outside Jackson County. The money to be made from cotton had produced a class division between those who picked and those who profited.[31]

Both the opportunities in Jackson County to own land, and its overall value, have improved slightly at the century's close. According to the 1990 census, the median value of a home in the county was $43,800, a little below the statewide median of $48,100. An individual owning his own piece of land still was not universal, as renters make up almost 40 percent of the county's 10,455 occupied housing units. In 1947, the population of Altus stood at 12,000, and some predicted that number would increase to 20,000 by the early 1950s. The number of inhabitants peaked at 23,302 in 1970, before creeping downward to 21,910 in 1990. However, by mid-decade the farmland surrounding the city of Altus underwent a transformation similar to places where urban and rural meet across the West. A recent spate of residential and commercial development on former farm acreage has shown to be the only force strong enough to encroach onto cotton's domain.[32]

Uses of Project Water

Much of the credit for the rapid success of irrigation in Altus belongs to the United States

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31. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Altus Project*, Vol. 6, 1946, 60; Drue Dunn, "The W. C. Austin, Part 2, Crop Development Under Irrigation," in *The Reclamation Era*, (June, 1950): 120; *Annual Project History, Altus Project*, Vol. 1, 1940-1, 56.
32. U.S., Department of Commerce, Bureau of Census, *1990 Census of Population and Housing, West South Central Division, Vol. 1*, Summary Tape File 1A, (Washington, D.C.: 1991); *Altus, The Irrigation Pioneer*, 22.

Soil Conservation Service. They assisted the Bureau in providing technical assistance to project farmers to ready their land for delivered water. The Soil Conservation Service helped prepare more than 15,000 acres of land for irrigation paving the way for the 46,777 acres now serviced by the Lugert-Altus Irrigation District. Dry land farmers' "inexperience and inadequate land preparation" did not portend for phenomenal success after the first deliveries were made, but the project's first five years did show "distinct success," according to most everyone involved with its operation.[33]

Since the first seedlings were planted a century earlier, cotton was still king in Altus in the early 1990s. Except for three years during the war when more acres were in wheat, no other crop has mounted a challenge to its throne. Immediately after irrigation's introduction in 1946, farmers were averaging half a bale of cotton more per acre. In 1991, 32,654 acres of lint cotton produced $18.3 million in revenue. Following cotton in planted acres were wheat with 4,296, and hay with 909. Only 60 acres of nut trees offered any noticeable diversity.[34]

Lake Altus still was not immune from a dilemma that plagued other storage facilities in the southwest – silt. A 1967 sediment survey indicated a 14 percent loss in the reservoir's capacity over the previous two decades. Silt had killed one dam at Altus, and with an average annual accumulation rate of 838 acre-feet, its fifty billion gallons remain under threat. On the land, soil erosion is as much a part of the topography as the cotton that grows on it. After Altus Dam was completed, the Bureau and a number of federal and state organizations worked out a conservation plan that held much of the erosion associated with dry land farming in check.[35]

Like a reoccurring bad dream, serious droughts blighted the southwest United States during the 1950s and 1970s, following a twenty year pattern going back to the thirties. Following the standard set by the W. C. Austin Project, some 12 million acres of Oklahoma were submerged underwater between 1940 and 1975; although the majority of that amount is in the

33. Willis C. Boegli, "The W. C. Austin Plan, Part 1," in *The Reclamation Era*, (May, 1950): 95; "W. C. Austin Project," 214.
34. U.S., Department of Interior, Bureau of Reclamation, *1991 Summary Statistics: Water, Land and Related Data*, (Denver: 1991), 298; "W. C. Austin Irrigation Project," 214.
35. U.S., Department of Interior, Bureau of Reclamation, *The 1967 Altus Reservoir Sediment Survey*, (Denver: March, 1971), 28; John G. Koogler, "Combined Attack on Erosion," in *The Reclamation Era*, (November, 1949): 214.

eastern half of the state. The project has helped individual landowners and a rural economy hold on, and judging from the natural and man-made forces against those who make a living from the soil, the project is the best deal Jackson County farmers ever had.

Conclusion

Oklahoma's original pioneers came west in wagons and by horseback. Their descendants also broke new ground by maintaining what the first settlers established. The W.C. Austin Project was one of those building blocks of civilization. Economic hardships in the 1930s, and wartime limitations later on, were the parameters that shaped the Altus Dam and the project's overall development. For all the one-of-a-kind features surrounding the W.C. Austin Project, it did not radically change what farmers grew or the ways they live their lives. In battle against the various moods of Oklahoma's often ferocious weather, it does provide stability that should prevent another scene of people and crops uprooted by the shifting soil.

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