

The Cedar Bluff Unit

Smoky Hill Division

Pick-Sloan Missouri Basin Program

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Table of Contents

The Cedar Bluff Unit	2
Project Location	2
Historic Setting	2
Project Authorization	3
Construction History	4
Post Construction History	6
Settlement of Project Lands	7
Project Benefits and Uses of Project Water	8
Conclusion	9
About the Author	9
Bibliography	10
Archival Collections	10
Government Documents	10
Internet Sources	10
Other Materials	10
Index	12

The Cedar Bluff Unit

For as long as there had been farming in the western parts of Kansas, dry land farming had been a way of life. But when severe drought hit the region in the 1930s, area farmers realized that a more reliable way must be found. Towards that end, local farmers and organizers sought the aid of the Bureau of Reclamation to develop reliable irrigation.

Project Location

The Cedar Bluff Unit covers about 6,800 acres of land along the north side of the Smoky Hill River in east-central Kansas about 18 miles southwest of Ellis. Cedar Bluff Dam and Reservoir is located in Trego County while most of the project lands are in Ellis County to the east. Water is transported to project lands via the Cedar Bluff Canal which runs west to east along the north side of the river.¹

Historic Setting

Irrigation came to the area of western Kansas much earlier than other parts of the Great Plains. Almost 200 years before the first Anglos settled in the area, a group of Taos Indians came to the region to escape Spanish rule, establishing the northern most pueblo in the United States. There they cultivated crops using a system of irrigation ditches that drew from nearby springs. They lived there for about 20 years before returning to their homes in the south. Later, around 1700, a group of Picuri Indians lived at the pueblo for several years. In 1717, Juan Uribarri, who led the French explorer Robert La Salle to his death in 1687, opened a trading post at the pueblo. This was one of the first Anglo settlements in western Kansas. The post was abandoned around 1725.

1. Department of the Interior, Water and Power Resources Service, *Project Data*, (Denver: U.S. Government Printing Office, 1981), 821-2.

During the early- and mid-1800s, Anglo settlement in the region was limited, with barely a dozen settlements scattered through out the area. In 1875, large numbers of immigrant farms began establishing homesteads in what would become Ellis County. Agricultural production was limited mainly to dry land wheat farming. Stock grazing was also carried out, but to a lesser extent.²

Project Authorization

The severe drought of the 1930s and early 1940s in western Kansas focused national attention on the plight of area farmers, who depended entirely on dry farming, and fueled the call for formal investigations into the feasibility of irrigation projects in the region. In addition, several municipalities were becoming increasingly concerned about diminishing groundwater supplies and were looking for ways to supplement their existing sources. The Bureau of Reclamation began studying the problem as part of a larger program that involved study of the entire Missouri River Basin. Investigations of the Smoky Hill River Basin and the Cedar Bluff Unit began in late 1941, but were halted by the outbreak of World War II. Investigations resumed in 1946.

The Cedar Bluff Unit was authorized by the Flood Control Act of 1944 as a unit of the Pick-Sloan Missouri Basin Program, a joint program of the Bureau of Reclamation and the U.S. Army Corps of Engineers for the comprehensive, multi-purpose development of the water resources of the Missouri River Basin. The plan involved construction of numerous dams, reservoirs, and distribution systems for irrigation, flood control, fish and wildlife enhancement, recreation, and municipal and industrial(M&I) uses.³

2. "El Cuartelejo Indian Pueblo," At *Lake Scott*, <http://www.scottcity.net/lakescott/#pueblo>, Last update: 19 May 1998. Accessed: 13 July 1998; *Project Data*, 821.

3. *Project Data*, 821, 823-4.

Construction History

Reconnaissance surveys of the Smoky Hill River Basin began in 1939. Detailed investigations of the Cedar Bluff Project began in late 1941, but were suspended by World War II. Investigations resumed in 1945 as part of the larger Missouri River Basin Program. Pre-construction activities began in 1946, and by the end of the year, detailed topographic surveys were complete, the test drilling program was finished, and economic, water supply, and flood control estimates had been completed. Specifications for construction of Cedar Bluff Dam and relocation of a county road which ran through the reservoir area were issued in early December 1948. Bids were opened on February 8, 1949, and the contract for construction was let to a joint venture of the C. F. Lytle Company, Amis Construction Company, and San Ore Construction Company, on March 4, 1949.⁴

Work began April 1, 1949, with stripping of the foundation. This was followed by excavations for the cut-off trench a week later. Back-filling of the cut-off trench began in late June. Concrete placement in the cut-and-cover outlet conduit began in late July, and excavations for the spillway started in mid-August. A diversion channel was excavated around the construction site, and the river diverted into the channel on September 15. Excavations in the river channel began immediately after diversion. Backfill in the cut-off trench was completed on December 7.

Concrete and embankment placement was suspended during the coldest part of the winter, but excavations in the spillway area continued. Concrete placement in the spillway structure began in early March 1950, and concrete and embankment work resumed soon after.

4. Denver, National Archives and Records Administration, Rocky Mountain Region. Record Group 115, Records of the Bureau of Reclamation, Entry 10, "1946 Annual History - Cedar Bluff Project, Kansas," March 1, 1947: 12-3; "Annual Project History of the Cedar Bluff Unit, Smoky Hill Division, Missouri River Basin, Kansas," Calendar Years 1947, 1948, and 1949: 16.

Flooding during the second half of July caused delays, but no damage, and work continued ahead of schedule. The river was diverted through the completed outlet conduit on August 30. In mid-September, a coffer dam was constructed to stop the flow of the river through the outlet conduit, and storage of water in the reservoir began. The diversion intake of the conduit was then sealed with concrete, and installation of the outlet works control gates began. The last concrete in the spillway was placed on November 13, and by the end of 1950, the dam was essentially complete. The dam was transferred to operation and maintenance status on May 15, 1951, and all work under the construction contract was accepted as complete on September 29, 1951, almost 13 months ahead of schedule.⁵

Cedar Bluff Dam is a zoned earthfill structure, 202-feet high and 12,560-feet long. The total volume of the embankment is just under 8,500,000 cubic yards. The spillway is an uncontrolled concrete weir and concrete lined channel at the right abutment. Running through the center of the crest is a uncontrolled, 14½-foot by 10-foot orifice. In addition, there are eight, 5-foot square sluiceways through the base of the spillway crest. Each sluiceway is controlled by a single, 5-foot square slide gate. The maximum capacity of the spillway is 91,000 cubic feet per second (cfs). The outlet works consist of a concrete conduit through the base of the dam at the left abutment. The outlet is controlled by a single 4-foot by 5-foot slide gate. The capacity of the outlet works is 800 cfs. Cedar Bluff Reservoir has a maximum capacity of 376,950 acre-feet (af), of which just over 191,000 af is reserved for flood control operations. The surface area of the reservoir is 6,869 acres.⁶

Because of problems organizing an irrigation district to contract with Reclamation for

5. "Annual Project History of the Cedar Bluff Unit, Smoky Hill Division, Missouri River Basin, Kansas," Calendar Years 1947, 1948, and 1949: 16-7; Calendar Year 1950: xiii-xiv, 16; Calendar Years 1951-4: iv, 1.

6. *Project Data*, 824.

water deliveries and repayment of construction costs, construction of a distribution system would be delayed for over a decade after completion of the dam.

Post Construction History

In the years that followed completion of Cedar Bluff Dam, local organizers worked to establish an irrigation district. Several attempts failed, and Reclamation was forced to re-assess the project plan. In 1957, Reclamation formulated a new project plan, abandoning the original plan which had called for irrigation of 11,300 acres via a gravity and pump system. The new plan reduced the irrigable area to 6,200 acres. In early 1958, the Cedar Bluff Irrigation District was organized, and in September, Reclamation and the district signed a repayment and water delivery contract, clearing the way for construction of the distribution system.⁷

The first contract let in association with construction of the delivery system was let to the Bushman Construction Company for modification of the dam outlet works into canal headworks. The canal was constructed in three section. The first section was constructed by Utility Contractors Inc., which began work in February 1961, and completed their work in April 1962. The second section was built by the Ark Valley Construction Company beginning in May 1961, and finishing in November 1962. Section three, which included construction of the lateral system, was awarded to Harry Henery, Inc. Work began in April 1962, and was completed in July 1963.⁸

Cedar Bluff Canal is just over 18 miles long and has a maximum capacity of 125 cubic-feet-per-second (cfs). The canal is in earth or earth lined with a bottom width of 12 -feet and 2

7. Details of the attempts to organize a irrigation district are recorded in the annual project histories beginning in 1947 and running through 1959.

8. "Annual Project Histories" 1963: ii, 1, 5; Department of the Interior, Interior Missouri Basin Field Committee, "Progress, January - March 1961," 82; Department of the Interior, Interior Missouri Basin Field Committee, "Annual Report - June 1961," 54; Department of the Interior, Interior Missouri Basin Field Committee, "Program Issue - January - March 1962," 62.

to 1 side slopes. The maximum water depth is just over 4-feet.

In 1959, the Bureau of Sport Fisheries and Wildlife established the Cedar Bluff National Fish Hatchery just downstream from Cedar Bluff Dam. The hatchery raised several varieties of fish which are then used to stock waters in western Kansas and eastern Colorado as well as portions of Oklahoma and Texas. The facility received its water from Cedar Bluff Reservoir. Operation of the facility was discontinued in 1983, and it is now used to raise Canadian Geese.⁹

In April 1963, Reclamation and the city of Russell, Kansas, signed a long term contract for delivery of 2,000 af per year for municipal and industrial uses. In October 1969, the repayment contract between Reclamation and the irrigation district was amended to increase the project area to 6,800 acres.

Throughout the late 1960s and into the 1970s, the flow of the Smoky Hill River declined significantly. There are several theories as to why, but increased ground water pumping coupled with the high evaporation rate in that part of Kansas are believed to be the primary reasons for the decline. The situation became critical, and in 1978, no water was available for irrigation, and none would be available in the future. In October 1992, Public Law 102-575 reformulated the Cedar Bluff Unit and allowed for the dissolution of the Cedar Bluff Irrigation District. The distribution system was abandoned and the district disbanded in 1994. Control of that portion of the reservoir capacity dedicated to irrigation storage has been taken over by the Kansas Water Office and the Kansas Department of Wildlife and Parks.¹⁰

Settlement of Project Lands

All of the land within the project boundaries was in private ownership prior to

9. United States Department of the Interior, Bureau of Sport Fisheries and Wildlife, *Cedar Bluff National Fish Hatchery, Kansas*, Pamphlet No. 832-307 (U.S. Government Printing Office, [date unknown]).

10. "Dust in the Ditches," segment in "Smoky Hill - Saline River Basin," Program 803, *Sunflower Journeys*, produced by Jim Kelly, (Topeka: KTWU/Channel 11, 1995); Public Law 102-575 (106 Stat. 4600) Title IX - Cedar Bluff Unit, Kansas.

construction of the project, so no lands were available for new settlement. Just over 15,000 acres of land was acquired by Reclamation for construction of project facilities. In addition, Reclamation has over 2,800 acres of easements on private lands within the project area. In 1989, the most recent year for which data is available, 140 people lived on farms in the project area.¹¹

Project Benefits and Uses of Project Water

The Cedar Bluff Unit was designed as a true, multi-purpose development providing a wide range of benefits to the area. But the abandonment of the distribution system effectively eliminated irrigation as the primary project benefit. With the loss of irrigation benefits, Recreation became a primary project benefit. Cedar Bluff Reservoir and the surrounding lands offer more than 7,700 acres of land and 1,500 surface acres of water for recreational uses. Primary recreational activities include fishing, camping, water skiing and boating. More than 175,000 people visit the reservoir each year. Recreational activities at Cedar Bluff Reservoir are administered by the Kansas Department of Wildlife and Parks.¹²

Other project benefits include flood control and water for municipal and industrial uses. Since its completion in 1951, Cedar Bluff Dam and Reservoir has prevented more than \$175,000,000 in damage due to flooding along the Smoky Hill River down stream from the reservoir. Flood control operations are carried out using procedures established by the Army Corps of Engineers. The city of Russell, Kansas holds storage rights for 2,700 af in Cedar Bluff Reservoir and can receive up to 2,000 af per year for municipal and industrial uses. Water for M&I use is released directly into the Smoky Hill River and diverted down stream by the city.¹³

11. Department of the Interior, Bureau of Reclamation, *1989 Summary Statistics. Water, Land and Related Data*, (Denver: U.S. Government Printing Office, [Publication date unknown]), 56, 106.

12. Department of the Interior, Bureau of Reclamation, *1992 Summary Statistics. Water, Land and Related Data*, (Denver: U.S. Government Printing Office, 1995), 107, 113; *Project Data*, 823-4.

13. *Project Data*, 823; Memorandum: Dan Jewell, Group Leader, Water Resources Services Group (Great Plains Region), to Assistant Commissioner - Resources Management, 1997 Flood Control Operations and Benefits - (continued...)

Conclusion

The Cedar Bluff Unit is an unfortunate example of how Mother Nature can undo even the most thoroughly thought-out plans. But the loss of irrigation benefits has not eliminated all benefit. Recreation, flood control, fish and wildlife enhancements, and water for municipal and industrial uses will continue to benefit the residents of the region well into the next century.

About the Author

William Joe Simonds was born and raised in Colorado and has a clear understanding of the importance of water in the American West and its influence on the development of that region. He attended Colorado State University where he received a BA in History in 1992 and a Masters in Public History in 1995. He lives with his wife and two children in Fort Collins, Colorado.

13. (...continued)
Great Plains Region. 20 February 1998; Department of the Interior, Bureau of Reclamation, *Repayment of Reclamation Projects*, (Washington: U.S. Government Printing Office, 1972), 280.

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Index

Amis Construction Company	4
Ark Valley Construction Company	6
Bureau of Reclamation	3, 7
Bureau of Sport Fisheries and Wildlife	7
Bushman Construction Company	6
C. F. Lytle Company	4
Cedar Bluff Canal	2, 6
Cedar Bluff Dam	2, 4-9
Cedar Bluff Irrigation District	6, 7
Cedar Bluff National Fish Hatchery	7
Cedar Bluff Project	4
Cedar Bluff Reservoir	2, 5, 7, 8
Cedar Bluff Unit	2, 7, 8
Cedar Bluff Canal	2, 6
Cedar Bluff Dam	2, 5-9
Cedar Bluff Reservoir	2, 5, 7, 8
Colorado	7
Contractors: Cedar Bluff Canal	
Ark Valley Construction Company	6
Bushman Construction Company	6
Harry Henery, Inc.	6
Utility Contractors Inc.	6
Contractors: Cedar Bluff Dam	
Amis Construction Company	4
C. F. Lytle Company	4
San Ore Construction Company	4
Ellis County	2, 3
Flood Control Act of 1944	3
Great Plains	2
Harry Henery, Inc.	6
Kansas	2, 3, 7
Ellis	2
Ellis County	2, 3
Russell	7, 8
Trego County	2
Kansas Department of Wildlife and Parks	7, 8
Kansas Water Office	7
La Salle, Robert	2
Laws and Legislation	
Flood Control Act of 1944	3
Public Law 102-575	7
Missouri River Basin	3
Missouri River Basin Program	4

Native Americans	
Picuri	2
Taos	2
Oklahoma	7
Pick-Sloan Missouri Basin Program	3
Cedar Bluff Unit	3, 8
San Ore Construction Company	4
Smoky Hill River	2, 7, 8
Smoky Hill River Basin	3, 4
Texas	7
Trego County	2
U.S. Army Corps of Engineers	3, 8
Uribarri, Juan	2
Utility Contractors Inc.	6
World War II	3, 4