Dallas Creek Project

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The Dallas Creek Project

In the high mountain valleys of western Colorado, the land is often rich and fertile. But the short growing season and the lack of readily available water make it difficult for farmers to fully utilize the richness of the region's lands. In addition, the short growing season limits the crops which can be grown to those which tend to have low value per acre, making it difficult for farmers to pay for the elaborate irrigation systems necessary to bring a full supply of water to their lands. While it is possible to develop these rich lands, the costs involved make it almost impossible without some kind of assistance. In the late 1950s, the Bureau of Reclamation developed a solution to the cost problem, and the Dallas Creek Project was one of many projects to benefit from that solution.

Project Location

The Dallas Creek Project is located on the Uncompahgre River in west-central Colorado. The area served by the project comprises most of the Uncompahgre River Basin and includes lands in Montrose, Delta, and Ouray Counties. The project is named for Dallas Creek, a major tributary of the Uncompahgre River. Ridgway Dam and Reservoir, the primary features of the project, are located on the Uncompahgre River a few miles north of the town of Ridgway. Lands served by the project run along both sides of the Uncompahgre River northward from Colona to Delta where the Uncompahgre River feeds into the Gunnison River.[1]

Historic Setting

Throughout the history of west central Colorado, the junction of the Uncompahgre and Gunnison Rivers has been a crossroads of exploration. The first Europeans to arrive in west-

1. United States Department of the Interior, Water and Power Resources Service, *Project Data*, (Denver: US Government Printing Office, 1981), 411

central Colorado were Spanish explorers. In 1761, Don Juan Maria Rivera explored the region for the Royal Governor of New Mexico. Rivera's route took him up the Dolores River and across the Uncompahgre Plateau to the Uncompahgre River. He then continued north to where the Uncompahgre River meets the Gunnison River, near the present day town of Delta, where he carved his initials into a tree. Rivera then continued west out of the region. The next expedition into the area was the Dominquez-Escalante Expedition. Padre Francisco Silvestre Velez de Escalante and Padre Antanasio Dominquez left Sante Fe in July 1776, following the same route as Rivera. When the expedition reached the junction of the Uncompahgre and Gunnison Rivers, they found the tree where Rivera had carved his initials fifteen years before.[2]

By the late 1820's, after Mexico had gained its independence from Spain, fur trappers were beginning to make their way into the region. One of them, Antoine Robidoux, built a trading post and fort near the junction of the Uncompahgre and Gunnison Rivers. The fort, the first of its kind in Colorado, served as a supply and trading post for the trappers in the area, with occasional trade being conducted with the Ute. The post was abandoned in 1844.[3] In 1853, Captain John Gunnison, while exploring a possible rail route between St. Louis and San Francisco, passed near the ruins of Fort Robidoux as he headed west. Gunnison reported that the area was unfit for cultivation. In July 1858, a party led by Colonel William W. Loring left Camp Floyd, Utah, and headed east over Gunnison's route. Loring disagreed with Gunnison's assessment of the region. On August 29, while traveling south on the Uncompahgre River, Loring noted that the soil seemed rich, easily irrigated, and that rains were frequent.[4]

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2. Susan M. Collins et al, "Survey of Cultural Resources in the Lower Gunnison Basin Unit, Colorado River Water Quality Improvement Program: Delta and Montrose Counties, Colorado," Prepared for the U.S. Department of Interior, Water and Power Resources Service. Laboratory of Public Archaeology. (Fort Collins: Colorado State University, 1981), pp. 40-1.
3. *Ibid*., 41-2.
4. *Ibid*., 42-3.

The gold rush of the late 1850s in Colorado brought hundreds of fortune seekers to the territory, but few prospectors ventured into the west-central region. By 1861, when the Territory of Colorado was created, the areas around the junction of the Gunnison and Uncompahgre Rivers was still considered Indian country. In 1863, the Treaty of Conejos made the entire western part of Colorado the exclusive domain of the Ute. However, continued population growth in Colorado brought settlers into direct conflict with the Ute. In 1878, Nathan Meeker was sent to western Colorado to begin the process of removing the Indians from their lands. On September 22, 1879, the Indians revolted, killing Meeker and several others. Troops sent to assist Meeker were also attacked, and 14 were killed. The response to the attacks was swift, with a treaty being forced upon the Ute that removed them from their lands in Colorado to a reservation in Utah. By September 1, 1881, the last of the Ute Indians had left western Colorado.[5]

Following the removal of the Ute Indians, settlers rushed into the region to claim the best lands. The first lands claimed were those along the river banks. These were the most fertile and easy to irrigate. As the population of the region grew, towns were formed. On October 1, 1881, barely one month after the removal of the Ute, George A. Crawford, purchased some land near the junctions of the Uncompahgre and Gunnison Rivers, and two weeks later incorporated the Uncompahgre Town Company. The town was surveyed and platted in December 1881, and a post office established on January 5, 1882. On April 6, 1882, the Town of Uncompahgre was dedicated. Because Uncompahgre was too difficult for many to pronounce, the name was changed to Delta in August 1882. The town grew rapidly, and in a short time featured several stores, a blacksmith shop, a hotel, and many homes.[6]

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5. *Ibid*., 46-8.
6. *Ibid*., 48-9.

Most early settlement in the area focused around agriculture. Although vegetables and grains were grown, Delta County became famous for its fruit orchards, and was second only to Mesa County in west slope fruit production. Ranching was also a major industry in the valley. First introduced in the region in 1882, the cattle industry grew to become one of the most important activities in the area.[7]

Population growth placed a premium on the best lands. Lands away from the easily irrigated river valleys needed a source of water. The first irrigation ditch was the Garnet Mesa Ditch, near Delta. Notice for the Garnet Mesa Ditch was filed on November 30, 1881. In March 1882, the Delta Ditch Company was formed to supply water to the Town of Delta. The need for water in the region started a ditch boom, with numerous ditches being built around Delta and throughout the region. An incident that underscored the importance of water to the area occurred on July 2, 1890. Mark Powers caught Charles Bear, president of a local ditch company, digging a canal on Powers' property. When Bear, believing that he should have right-of-way, refused to leave, Powers shot and killed him. Powers was convicted of manslaughter and sentenced to life in prison.[8]

In 1904, the United States Reclamation Service (renamed the Bureau of Reclamation in 1923) began construction of the Uncompahgre Project to irrigate lands along the Gunnison and Uncompahgre Rivers. The project began water deliveries in 1912. The successful irrigation of lands along the lower Uncompahgre Valley stimulated interest in irrigation developments in the upper valley near Loghill Mesa, south of Ridgway.[9]

Project Authorization

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7. *Ibid*., 51-2.
8. *Ibid*., 53-6.
9. *Project Data*, 411, 1241-4.

Following the end of World War II, Reclamation began investigations for additional developments in the upper Uncompahgre River Basin (the Uncompahgre Project, constructed prior to World War I, provides water to over 75,000 acres in the Delta/Montrose area in the upper Uncompahgre Basin). Early planning was aimed at developing water for irrigation. One of the first plans, the Ouray Project, was never formally published, but became the basis for future planning in the Uncompahgre Basin.

In early 1951, Reclamation published a preliminary report on the Gunnison River Project, an extensive development that included the Dallas Creek Unit which incorporated many features of the earlier Ouray Project. Following publication of the 1951 report, Reclamation looked at several alternatives, including the addition of hydroelectric power development. Problems locating a suitable dam site and potential conflicts with existing water rights caused the project to be dropped from consideration.

Another problem that threatened the project was cost. In the high mountain valleys of the Uncompahgre Basin, the cash value of crops produced per acre was much lower than that of crops produced in areas with longer growing seasons. Unless additional revenue could be secured, area water users would be unable to repay project costs. The problem was alleviated in 1956 when Congress passed the Colorado River Storage Project (CRSP) Act. One of the features of the act was that excess revenues from power production at CRSP facilities could be used to help repay the costs of designated participating projects. The Dallas Creek Project was designated a participating project.

Following its designation as a participating project, the Dallas Creek Project was given a high priority and concentrated feasibility investigations began. The 1951 report was further refined and published in a 1966 report which, for the first time, included water for municipal

uses. The 1966 report was the basis for congressional authorization of the project in 1968. The Dallas Creek Project was authorized by Congress as part of the Colorado River Basin Act of September 30, 1968 (Public Law 90-537), as a participating project under the Colorado River Storage Project Act of April 11, 1956 (Public Law 84-485). The definite plan report was published in 1976, outlining revisions brought about by changing conditions. The final environmental statement was filed in September 1976, and included analyses of the impact of the project on water quality, fish and wildlife, recreation, social and economic conditions, and historical and archaeological resources.

On January 14, 1977, the United State Government and the Tri-County Water Conservancy District signed a repayment contract which allows for the repayment of certain project cost, delivery of project water for irrigation and municipal and industrial uses, and for operation, maintenance, and replacement of project works following completion of construction.[10]

Construction History

Ridgway Dam was constructed in two stages under two separate contracts. Stage One consisted of excavation of the cut-off trench to suitable foundation material, treatment of the excavated surface, grouting the foundation, and back-filling the trench to the approximate level of the river; construction of the river outlet works including channel excavations, construction of the concrete conduit, gate chamber, and the initial stages of the outlet works stilling basin and control house; and placement of instrumentation to monitor conditions within the dam embankment, abutments, and foundation. Stage Two included completion of the dam

10. *Ibid*., 412-3. Additional information provided by the Bureau of Reclamation Western Colorado Area Office-Northern Division, Grand Junction, Colorado.

embankment, outlet works, construction of the spillway, construction of several access roads, and the installation of additional monitoring instrumentation.

Bids for the stage one contract were opened in September 1979, and the contract was awarded to the Green Construction Company of Des Moines, Iowa. Their bid of $14,997,765 proved to be the lowest of the twelve bids received and less than $50,000 over the engineer's estimate. The contract was awarded and notice to proceed was issued on December 6, 1979.[11]

Green Construction Company began mobilizing its workforce in January 1980, and began operations in February with excavations for the river diversion channel. Excavation of the cut-off trench and for the river outlet works began in March, and the river was directed into the diversion channel on March 12. Installation of the foundation monitoring equipment also began in March. Excavation of the cut-off trench on the right abutment and stripping of the left and right abutments were completed in May, and drilling of grout holes by a sub-contractor began in June. Grouting operations commenced in July with concrete operation beginning on July 31. The cut-off trench was completed to its maximum section in early September. Grouting operations and installation of monitoring equipment continued through the fall of 1980 before shutting down for the winter in December.[12]

Green Construction resumed work in March 1981, with the final excavations for the river outlet works stilling basin. Concrete operations resumed on March 23. In early May, a strike by members of the Carpenters Union halted all work on the river outlet works. Placement of zone 1 embankment material in the cutoff trench began on May 14. Placement of zone 2 material began

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11. United States Department of the Interior, Bureau of Reclamation, *Final Construction Report on Ridgway Dam and Reservoir, Stages One and Two, Dallas Creek Project, Colorado*, Volume I, (Durango Projects Office, June 29, 1990), 2-3, 6-1 - 6-6.
12. *Ibid*., 1-1 - 1-3.

on May 19. Striking carpenters returned to work on June 18, and concrete placement in the outlet works resumed on June 22.

Excavations in the outlet works stilling basin was completed in early July, and concrete placement in the outlet works stilling basin began on July 22. On July 30, the Teamsters Union went on strike. The contractor replaced the striking teamsters with non-union labor beginning July 30. The river was diverted into a new channel on September 12, and excavations for the cut-off trench across the old diversion channel began two days later. The grouting sub-contractor resumed grouting operations in late September. Placement of zone 3 material around the outlet works conduit commenced in late September, with concrete placement in the outlet works gate chamber beginning on October 20. Placement of concrete in the outlet works conduit and stilling basin was completed in December, and all concrete and earthwork operations were suspended for the winter on December 29.[13]

Concrete operations resumed in March 1982, and the final placement of concrete in the outlet works took place on March 23, bringing to a close concrete operations under the stage one contract. The last placement of zone 1 material under the stage one contract came on April 9, followed by the last placements of zone 3 material on April 13. The contract for stage one construction was accepted as complete on April 22, 1982.[14]

The bids for stage two were opened in July 1982. The winning bid was submitted by Granite Construction Company of Watsonville, California, which bid $44,817,430, almost $13,000,000 less than the engineer's estimate. The contract was awarded on August 13, 1982, and notice to proceed was issued on September 1, 1982.[15]

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13. *Ibid*., 1-4 - 1-6.
14. *Ibid*., 1-6 - 1-7, 6-3.
15. *Ibid*., 2-3, 6-1 - 6-6.

Granite Construction Company received the notice to proceed with work under the contract for stage two on September 1, 1982, and began mobilizing their forces on September 9. Additional stripping of the right abutment and excavations for the embankment started in October. In November, Granite began shotcrete treatment of the right abutment, and in early December, operation of the company's aggregate plant began.

To allow for more thorough geological investigations and extensive grouting of the left abutment, a grouting and drainage tunnel was excavated into the left abutment. Work on the tunnel began in late February 1983 with excavations for the tunnel portal. Excavation of the tunnel began on March 2. First placement of zone 1 material under the stage two contract was initiated in April, and the first placement of concrete in the spillway came on April 28. Excavation of the grouting and drainage tunnel was complete on April 30, and placement of the concrete tunnel lining began in early May. In addition, concrete placement in the spillway conduit and the cut-and-cover conduit, which would provide access to the grouting tunnel, began in early May. Grouting operations on the right abutment also began in early May.[16]

August 1983 saw the completion of concrete placement in the grouting tunnel lining, and the beginning of placements in the spillway chute and stilling basin floor. Concrete placements in the cut-and-cover drainage tunnel access conduit began in September, and on October 8, the river was diverted through the completed river outlet works. In late November, Granite Construction began to shut-down abutment grouting operations for the winter, moving their equipment into the grouting tunnel to begin grouting the left abutment from within the tunnel.

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16. *Ibid*., 1-7 - 1-8, 2-3.

Grouting operations in the tunnel continued through the winter and were completed in early April 1984. Abutment grouting from the outside resumed in mid-April.[17]

Concrete placements in the spillway intake structure and spillway chute and stilling basin walls began in May. The intake structure was completed in October, and the chute and stilling basin in November. Embankment placing operations were shut down during the winter and resumed the following spring. In May 1985, the last concrete was placed in the river outlet intake structure. Embankment placing continued through the warm season and were discontinued as winter approached. Concrete placement in the spillway conduit was completed in August.

When embankment work resumed in the Spring of 1986, the embankment was nearing completion. The dam was topped out in early August, leaving only finishing work and installation of the outlet works control gates. On October 20, the iron slide gate that had been used to control river flows through the outlet works was closed for the last time. Diversions were made through a by-pass pipe that had been installed to provide diversions until the outlet works control gate could be installed and tested. Although the dam was complete, finish work, road construction, and clean up continued into the next year. The contract for stage two was accepted as complete on July 2, 1987.[18]

Ridgway Dam is a rolled earthfill dam with a maximum height of 399 feet above the lowest point of excavation and a crest length of 2,460 feet. The embankment contains just under 11,000,000 cubic yards of material. The outlet works consist of an intake structure and concrete conduit leading to a gate chamber embedded in the dam. The gate chamber contains a single 5 -foot by 6 -foot high-pressure emergency slide gate. Downstream from the gate chamber,

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17. *Ibid*., 1-8 - 1-9, 7-5.
18. *Ibid*., 7-9 - 1-11, 6-6.

outflows continue through a 64 -inch diameter pipe housed in a 11½ - foot diameter access conduit. Just upstream from the outlet works control house, the pipe splits into two smaller pipes. Flows from the outlet pipes are regulated by two high pressure regulating gates which discharge into the stilling basin. In addition, there is a 24 -inch by-pass conduit which begins just upstream of the gate chamber. The by-pass conduit is controlled by a 24-inch butterfly valve in the gate chamber. Downstream from the gate chamber, the by-pass conduit is suspended from the top of the outlet works access conduit. Flows through the by-pass conduit are regulated by a single 20-inch jet flow valve. The by-pass conduit can be used to make releases when the primary outlet works are undergoing maintenance and inspection.

The spillway is located near the right abutment and consists of an uncontrolled, glory-hole type inlet, a 750 -foot long, 16½ -foot diameter concrete conduit, and rectangular open chute, and stilling basin. The spillway has a maximum capacity of 9,830 cubic feet per second (cfs). The outlet works have a maximum discharge capacity of 1,440 cfs.

Ridgway Reservoir has a maximum storage capacity of 84,230 acre-feet (af) with a maximum surface area of 1,030 acres. It is just over 4½ miles long and has slightly more than 13 miles of shoreline. There are no Reclamation constructed distribution facilities. Water supplies are distributed through existing facilities or facilities constructed by the water users. Although the project development plan includes construction of a 4,200 kilowatt hydropower facility at the dam, this has been deferred pending agreement with a non-federal partner.[19]

Post Construction History

Storage of water in Ridgway Reservoir began in October 1986, when the river outlet works were sealed to allow installation of the outlet control gates and completion of the outlet

19. *Ibid*., 2-1 - 2-4, 6-43; *Project Data*, 411

works. Until the outlet works were completed, river releases were directed through the 24 -inch by-pass pipe. Since the inflows to the reservoir were often greater than the outflow capacity of the by-pass, uncontrolled filling of the reservoir began. Designers had anticipated the period of uncontrolled filling and scheduled completion of the outlet works to coincide with the period of lowest river flows. The outlet works were complete in the spring of 1987, and the bulkhead gate sealing the river outlet works was removed, allowing controlled releases through the outlet works.

Controlled filling of the reservoir began in April 1987. Reservoir filling operations followed a detailed, four step process that allowed for close monitoring of the dam during the initial filling operations. During the initial filling, Reclamation personnel provided daily, round-the-clock monitoring of the embankment and foundation instrumentation as well as frequent visual inspections of the dam embankment, looking for seepage, settlement or displacement of the embankment. Each stage of the filling operation took approximately one year, and in early May 1990, the reservoir level reached the lip of the spillway, and for the first time, water began to flow into the spillway. Spills continued for about a month before releases through the river outlet works were increased to bring the level of the reservoir down to normal operating levels. During the initial filling period, no significant problems were encountered.

The Dallas Creek Project was transferred to operation and maintenance status on January 1, 1991. The project is managed by the Tri-County Water Conservancy District.[20]

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20. United States Department of the Interior, Bureau of Reclamation, "Ridgway Dam, Dallas Creek Project, Colorado. First Filling Criteria, Final Revisions, April 13, 1987,"in *Final Construction Report on Ridgway Dam and Reservoir, Stages One and Two, Dallas Creek Project, Colorado*, Volume III, (Durango Projects Office, June 29, 1990); "Ridgway Dam Spilling," *Montezuma Valley Journal*, 15 May 1990; Denver, National Archives and Records Administration. Records Group 115. Records of the Bureau of Reclamation. "Annual Project Histories: Dallas Creek Project," Vol. II, 1990: 9, 17 (hereafter cited as "Project History" with volume number, year, and page). Additional information provided by the Bureau of Reclamation Western Colorado Area Office-Northern Division, Grand Junction, Colorado.

Settlement of Project Lands

The Dallas Creek Project was primarily designed to provide supplemental water to lands already under irrigation and water for municipal and industrial uses. All of the subject lands were already settled and developed prior to construction of the project, so no new lands were withdrawn for future settlement nor did the project significantly alter or increase settlement in the area.

Project Benefits and Uses of Project Water

The major portion of irrigation water supplied by the Dallas Creek Project is used to augment supplies on Reclamation's Uncompahgre Project. A small amount of water is available for use on new lands on a subscription basis. The greatest portion of water supplied by the project, approximately 28,000 af, is for municipal and industrial uses in the towns of Montrose, Olathe, and Delta, and surrounding rural areas. Recreation is a significant project benefit, and a large inactive reservoir pool, over 20,000 af, is maintained to support recreation, and fish and wildlife enhancements. Recreation activities at Ridgeway Reservoir are managed by the Department of Natural Resources, Colorado State Parks.

Ridgway Reservoir also provides an element of flood control, providing storage capacity to help reduce spring floods from melting snow.[21]

Conclusion

The Dallas Creek Project was one of the last Reclamation projects to receive Congressional approval. Constructed during a period of increasing environmental activism and concerns over dam safety following the failure of Teton Dam in Idaho, the project was subject to a wide variety of feasibility, safety, and environmental concerns which had to be addressed

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21. *Project Data*, 414; Department of Natural Resources, Colorado State Parks, "Ridgway," Brochure No. DPOR-RIDG-20M-6/97.

during the design and construction. Considering all of the obstacles that had to be overcome prior to and during construction, the successful completion of the project speaks well of its benefits.

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.

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