Pine River Project

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The Pine River Project

Each year along the Pine River in southwestern Colorado, high spring runoffs would give way to late summer drought. The development of farming and ranching in the area was severely limited by the uncertain nature of the water supply. Irrigation projects were developed in an effort to ease the problem, but met with only limited success. By the 1920s, all lands that could reasonably be developed using the available water supply had been taken up, leaving several thousand acres of potentially productive land undeveloped. In the late 1920s, the Office of Indian Affairs began investigations into the possibility of storing early season flood waters for irrigation of almost 17,000 acres of Indian land. In 1934, the investigations were turned over to the Bureau of Reclamation, and the Pine River Project was born.

Project Location

The Pine River Project is located in the San Juan National Forest in southwest Colorado about eighteen mile northeast of the town of Durango. Project lands are located in La Plata and Archuleta Counties and consist of about 69,000 acres of which about 16,000 acres are owned by the Southern Ute Indians. There are several small communities located within the boundaries of the project including Ignacio, Bayfield, Tiffany, and Allison. A small portion of San Juan County in northern New Mexico receives direct irrigation benefits from project water. The primary sources of water for the project are the Pine River, also known as the Los Pinos River, and Vallecito Creek. The main feature of the project is Vallecito Dam and Reservoir, which is located on the Pine River about 1.5 miles downstream from where the Pine River and Vallecito Creek merge. The drainage area above the dam is about 270 square miles with an average flow of about 253,500 acre feet (ac/ft).

The climate of the area is temperate and semi-arid. Due to the high elevation, from 6300 to over 7000 feet above sea level, the short growing season is only about 110 days. The average precipitation is around 16 inches, with only about half that occurring during the growing season. Irrigation is necessary for successful crop production. Temperatures can range from a low of

more than 30 degrees below zero to a high of over 100 degrees.[1]

Historic Setting

Pre-Historic Era

The earliest inhabitants of southwest Colorado were likely big game hunters of the Paleo-Indian era, about 10,000 to 5,500 B.C. Although data is limited, evidence of Paleo-Indian activities has been located in other areas of the Southwest. Evidence of Archaic Stage (ca. 5,500 B.C to A.D. 1) activities is more abundant, but still limited, with most evidence being from the late-archaic period. The Archaic Stage featured hunting of smaller game animals and an increased reliance on gathering of wild plants. The late-Archaic Stage marks the transition to a more sedentary, food-producing way of life.

The Formative State in the Southwest is also known as the Anasazi Tradition. The period, from about A.D. 1 to 1,300, is marked by a growth in settled villages and food production supplemented by hunting and gathering of wild plants. In addition, this period marked a rise in material culture, religious and social organization, and interaction with other cultural groups. The majority of pre-historic sites in southwest Colorado are associated with the Anasazi, with the most famous, Mesa Verde, dating from about A.D. 1,000 to 1,300. Following the decline of the Anasazi in southwestern Colorado near the end of the 13th century, human occupation of southwest Colorado declined. It was probably not until sometime in the 1600s that the Ute entered the region. Some evidence of Navajo activities after 1700 has been located, but the Ute have been the primary native inhabitants of the region for several centuries.[2]

Historic Era

The first Europeans in the Pine River area were Spanish explorers seeking gold. In the

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1. Denver, National Archives and Records Administration: Rocky Mountain Region. "Annual Project Histories: Pine River Project," 1937: 16; 1947: 15-6 (hereafter cited as "Project History," followed by year and page number); United States Department of Interior, Water and power resources Service, *Project Data, 1981*, (Denver: U.S. Government Printing Office, 1981), 1023; Department of the Army, Sacramento District, Corps of Engineers, "Vallecito Reservoir, Los Pinos River, Colorado, Report on Reservoir Regulation for Flood Control," (Department of the Army, Sacramento District, Corps of Engineers January 1971), 2; "Vallecito Dam Nears Completion," *Western Construction News*, April 1941, 111; United States Department of Interior, Bureau of Reclamation, *Summarized Data on Federal Reclamation Projects*, (November 1941), 53.
2. Eddy, Frank W., Allen E. Kane and Paul R. Nickens, *Southwest Colorado Prehistoric Context*, (Denver: State Historical Society of Colorado, 1984), 4, 16.

early 1760s, Juan de Rivera explored the Southern Colorado Rockies, trading with the Ute, but finding no gold. In 1776, Fathers Francisco V. Dominquez and Silvestre Veldez de Escalante traveled through the region in search of a new route from Santa Fe to Monterey, California. Although others followed, hostile Ute and the lack of appreciable amounts of gold discouraged continued Spanish exploration, and few Spaniards ventured into the region after 1800.

American fur trappers began to appear in western Colorado shortly after the turn of the century. After 1821, when Mexico gained its independence from Spain, western Colorado was opened up to trapping and the fur industry flourished. During the height of the fur industry, a number of trading posts were built, including Fort Robidoux, at the junction of the Uncompahgre and Gunnison Rivers, and Fort Davy Crocket, in northwestern Colorado. The 1840s saw the decline of the fur industry due to overtrapping and the decline in the fur market, but a few trappers continued to work the region into the late 1870s.

Exploration of the west by the United States government did not begin in earnest until the late 1840s. Following the American victory in the Mexican War and the discovery of gold in California in 1848, the federal government began to look more closely at the west. One of the primary tasks of the western explorers was to locate transportation routes through the Rocky Mountains, especially rail routes. Among those who passed through the region were John C. Frémont in 1843 and 1853, Lt. Edward Beale and Captain John Gunnison in 1853, and Captain John Macomb of the Topographical Corps in 1859.

Significant exploration of the West by the United States government was interrupted by the Civil War. Following the war, the government resumed its exploration of the Rocky Mountain West. The Army and the newly formed United States Geological Survey (USGS) were the primary agencies exploring the region. The first USGS survey of Colorado was conducted by John Wesley Powell in 1868 and 1869 as part of his exploration of the Colorado River. The most comprehensive exploration of southwest Colorado was carried out by Ferdinand Hayden between 1873 and 1876. Hayden's report, along with Powell's, provided an enormous amount of accurate information about western Colorado and helped to stimulate

settlement of the region.[3]

The earliest Spanish expeditions into southwestern Colorado reported meeting and trading with the Ute Indians, and for almost a half century following their first contact with Anglos, the Ute continued their domination of western Colorado. Even with the growth of the fur trade in the early 1800s and the increased contact with Anglos that came with it, the dominance of the Ute was not challenged. It was not until 1849 that any serious threat appeared. In 1849, the first official treaty between the Ute and the United States Government, the Calhoun Treaty, was signed. In the treaty, the seven Ute bands agreed to recognize the sovereignty of the American Government and to stay within their traditional hunting ranges.

The first Colorado gold rush of 1859 brought thousands of miners into the region. Many who were unsuccessful in the diggings took to farming, and the expanding pressure of farmers and miners forced the Ute and the Government to the conference table. The Evans Treaty of 1863 sought to remove the Ute from the path of incoming white settlers and the place the tribe within set boundaries. The treaty was never implemented because the government failed to supply the Ute with the promised rations and livestock. The Ute continued to raid and hunt in their traditional areas. White settlers, who viewed the Ute as trespassers, looked to the government to intervene on their behalf. In 1868, the government and the Ute signed the Hunt Treaty that established a single reservation for all seven Ute bands. The treaty established an area equal to about one-third of the Colorado Territory as the Ute reservation and established two Indian agencies, one near the White River to serve the northern bands, and one near present day Ignacio, the Pine River (Los Pinos) Agency, to serve the southern bands. Continued mineral exploration in the San Juan Mountains of southern Colorado increased pressure on the lands of the Southern Ute. In 1873, the Brunot Agreement, also known as the San Juan Cession, removed 4,000,000 acres from the Ute Reservation in the San Juans and opened the land to mineral exploration and settlement. Both the Ute and the Anglos violated provisions of the treaty, and in 1878, a military post, Fort Lewis, was established near Pagosa Springs to enforce the treaty. The

3. Husband, Michael B., *Colorado Plateau Country Historic Context*, (Denver: State Historical Society of Colorado), IV2-IV4.

fort was moved to a site near Durango in 1880.

The White River Indian Agency had a history of problems after it was established in 1863. In 1879, Indian Agent Nathan Meeker attempted to establish a model agricultural community. The Ute resisted his efforts, and Meeker sought the aid of the Army. In late 1879, Major T. T. Thornburgh and about 140 men were dispatched to aid Meeker. Thornburgh and his men were attacked by the Ute about twenty miles from the White River Agency and wiped out. A short time later, the Ute attacked the Agency and killed Meeker and ten others. The Meeker Massacre and Thornburgh battle at Milk Creek led to the removal of the northern Ute bands to Utah in 1881. The Southern Ute were allowed to remain on their reservation and the remaining Indian lands were opened for settlement. By 1889, the only Ute lands that remained were the small Ute Mountain and Southern Ute Reservations in southwest Colorado.[4]

Under the agreement that removed the northern Ute bands to reservations in Utah, the members of the southern and mountain bands were to receive allotments of agricultural and grazing lands. Land was given to the heads of families and those over the age of eighteen. Those who were not qualified or chose not to accept their allotment were settled as a community on tribal lands. A total of 375 allotments totaling 72,970 acres along the Pine River were awarded by 1898. In 1899, the Government opened all surplus lands to settlement by whites.[5]

The earliest record of white settlement in the Pine River Valley dates to 1876, and the first ditches in the area were constructed in 1877. The first ditches served the Indian Agency and a few small farm tracts. In 1895, the Pine River Indian Agency filed claims for water from the Pine River to irrigate 18,336 acres of Indian land. This claim was contested by whites in the area who had filed earlier claims, and in 1901, an adjudication suit was filed against the Indian Agency.[6]

The Indians based their claims to use of the waters of the Pine River on the Hunt Treaty of 1868. All of the lands that are within the watershed of the Pine River were included in the

4. "Project History," 1943: 19; Husband, Michael B. *Colorado Plateau Country Historic Context*, IV12-IV13.
5. "Project History," 1937: 22; 1943: 10; 1945: 13.
6. *Ibid*., 1943: 9-10; 1944: 12.

boundaries set forth in the 1868 treaty. The treaty stated that these lands be

> "set apart for the absolute and undisputed use and occupation of the Indians . . . for the purpose of inducing said Indians to adopt the habits of civilized life and to become self-supporting."

Although the treaty did not specifically mention water for irrigation, a number of court decisions established that when the Government creates a reservation, if the land needs irrigation to be productive, the reservation is also established for the necessary water, even if no such reservation is stated within the agreement. In October 1930, the United States District Court for the District of Colorado awarded the Pine River Indian Agency the prior right for the use of 213 ac/ft of water from the Pine River establishing the date of the 1868 treaty as the priority date. In 1938 there remained about 200,000 acres of former reservation land that had not been settled. This land was returned to the Southern Ute Indians by Congressional order on September 14, 1938.[7]

Project Authorization

The Pine River Project was authorized by Congress in the Department of Interior Appropriation Act of 1937, which was approved on June 22, 1936. The project was approved by the President on June 17, 1937, following a review of a Finding of Feasibility Report. A portion of the cost of the dam and reservoir were financed from nonreimbursable funds appropriated for flood control benefits that would be realized through construction of the project. On January 3, 1940, the Office of Indian Affairs and the Bureau of Reclamation signed a memorandum of understanding wherein the Office of Indian Affairs would pay one-sixth of the reimbursable costs of construction of the Vallecito Dam. In return, the Office of Indian Affairs would have the rights to one-sixth of the water made available by construction of the dam. This water would be used to irrigate land on the Pine River Indian Irrigation Project. On April 15, 1940, the Pine

7. *Ibid*., 1937: 20-5.

River Irrigation District entered into an agreement with the United States whereby the District would pay five-sixths of the reimbursable costs of construction. The contract further stated that the Pine River Irrigation District would contract with owners of existing ditches for distribution of project water.[8]

Construction History

Investigations

Investigations into ways to supply the Pine River Valley with late season irrigation water started as early as 1906 with an investigation in connection with the Carey Act of August 1894. In 1912, the Pine River Ditch and Development Company looked into possible developments to provide supplemental water. In 1924 and 1925, the Reclamation Service conducted surveys of several potential projects, including Pine River. The findings of these surveys were published in the Fisher Report. In 1927, the Secretary of Interior appointed a special committee to investigate potential reclamation projects including irrigation of Southern Ute lands. The report, "Irrigation on Indian Reservations," was published in June 1928. In January 1936, the Indian Irrigation Service began investigations for the Pine River Dam, and test drilling of the dam foundation began in March 1936. The project was transferred to the Bureau of Reclamation for construction in August 1936. On February 11, 1937, the name of the dam was officially changed from Pine River Dam to Vallecito Dam to avoid confusion with other dams of similar name. Construction of the dam was approved by the President on June 17, 1937.[9]

Construction

Investigations into possible dam sites began in early 1936, with the final report being issued in May 1936. Three sites were found to be suitable with only the considerations of engineering and economics being deciding factors. Of the three sites, the site known as the "middle site" was chosen as being the best site from an economic and engineering standpoint. Following the selection of the site, survey work began and was carried out throughout 1936 and 1937. During the late part of 1936, representatives of several contractors visited the site

8. *Ibid*., 1947: 21-2.
9. *Ibid*., 1937: 10-1; 1943: 11; 1947: 19.

preparatory to submitting bids for construction of the dam. The acquisition of land required for the construction and operation of the dam was carried out without difficulty with all land purchase agreements and easements being completed by early 1939. No condemnation proceedings were necessary.[10]

Construction of the government camp by government forces began in September 1937. Bids for construction of Vallecito Dam and appurtenant works were opened in Durango, Colorado on December 15, 1937. A total of nine bids were received with the winning bid being submitted by the Martin Wunderlich Company of Jefferson City, Missouri. The winning bid was $2,115,870. Notice to proceed was issued on April 18, 1938, and work on the contractor's camp began on May 13. Clearing and stripping of the dam site began on May 14, 1937, with work limited to the right side of the river channel. Clearing and stripping on the left side of the river channel was delayed until the river was low enough to allow heavy equipment to cross the channel. A temporary diversion channel was excavated during July and August, and on October 15, following completion of stripping operations on the left side of the river, the river was diverted through the temporary channel. During stripping operations, a large deposit of sandy material was discovered requiring the excavation of 250,000 cubic yards (cu/yd) of material beyond work that had been estimated during site investigations. Most of the additional material was not usable in the dam embankment and had to be wasted.[11]

Excavation for the outlet works began in late June 1937 and was substantially complete by the end of the year. Excavations for the cut-off trench on the right abutment began as soon as stripping operations were complete. The cut-off trench provides a watertight seal between the dam and bedrock. The excavations ranged in depth from fifteen to fifty feet. Most of the work was completed by the end of 1938. Stripping of the spillway channel began in July with excavations beginning in early August. Much of the material excavated from the channel was screened and used in the dam embankment. Placement of embankment materials began in late June, following completion of stripping operations. The contractor tried to limit the material

10. *Ibid*., 1937: 12-5, 31, 34; 1938: 18-9.
11. *Ibid*., 1937: 35, 43; 1938: 25, 27-33.

used to only that which was removed from required excavations, but due to the nature of much of the material excavated, it was necessary to use material from a borrow pit. Embankment materials were spread in eight-inch layers and compacted by twelve passes of a sheepsfoot roller. The moisture content of the most of materials excavated from both the required excavations and the borrow pits was near the required level at the time of placement, so only a small amount of water had to be added. During the 1938 construction season, the contractor placed approximately 93,000 cu/yd of embankment material.[12]

Concrete placement in the outlet works began in early August and progressed as fast as excavation and grouting operations would allow. Before concrete operations were halted due to freezing weather, the trashrack structure, 400 feet of the outlet conduit, and a large portion of the gate chamber had been placed. Concrete operations were halted due to freezing weather on November 19, with all construction halted for the season on December 10.[13]

On May 19, 1938, the Weston Lumber Company of Denver contracted with the government for the purchase and removal of all saleable lumber from the Vallecito Reservoir site. The contractor agreed to pay $9,500 for the timber, and began work clearing the site in early June. During the 1938 season, the contractor cut approximately 1,500,000 board feet (bd/ft) of lumber, and sawed 1,200,000 bd/ft. It was estimated that there was 5,000,000 bd/ft of lumber in the reservoir site, and the contractor was given 1,000 days to remove all saleable lumber from the site.[14]

The construction of Vallecito Dam would flood the road that ran through the valley. As a result, it was necessary to relocate the road. The contract for relocation of the first portion of the road was awarded to the Martin Wunderlich Company on August 30, 1938, with notice to proceed given on November 5. Construction was started in mid-October, and was completed and accepted in late December 1938.[15]

Placement of embankment materials resumed on April 9, 1939, and continued until

12. *Ibid*., 1938: 31-43.
13. *Ibid*., 1938: 6, 50-1.
14. *Ibid*., 1938: 75.
15. *Ibid*., 1938: 6, 55.

halted by freezing weather on November 23. At that time, the average elevation of the embankment was 7,627 feet above sea level, with the final height to be 7,673 feet. By the end of 1939, the total amount of material placed in the embankment had reached 2,432,692 cu/yd. Concrete operations resumed on May 2, 1939, and continued until November 27. During the 1939 season, concrete placement in the outlet works was completed except for the control house and spiral stair shaft. The spillway was completed to the degree necessary to allow diversion of the river through the outlet works the following spring.[16]

Following suspension of embankment placement operations, the contractor began placement of rock riprap. Riprap consists of large rocks and boulders that are placed in layers several feet thick in areas that are subject to erosion from water flow or wave action. By the end of 1939, the contractor had placed 4,200 cu/yd of riprap.[17]

Clearing of the reservoir site in 1939 was confined to that area that would be flooded when the river was diverted through the permanent outlet works. During 1939, 208 acres were cleared of lumber and brush with additional areas partially cleared. Brush, unsalable timber, and other debris was piled and burned by Government and Civilian Conservation Corps (CCC) forces. By the end of 1939, the Weston Lumber Company had completed about two-thirds of their contract, removing a total of 2,500,000 bd/ft of timber from 335 acres. Of the 1,140 acres required to be cleared, 295 acres were completely cleared of all timber, brush and debris by the end of 1939.[18]

Government and CCC forces carried out road relocation work during 1939. During the 1939 season, they cleared approximately two and one-half miles of roadway. In addition to clearing the roadway, CCC and Government forces installed a total of 2,500 feet of metal pipe culverts ranging from 18 to 48 inches in diameter.[19]

By December 31, 1939, sixty-seven percent of the work under the main contract had been

16. *Ibid*., 1939: 3-4, 33.
17. *Ibid*., 1939: 33-5.
18. *Ibid*., 1939: 15.
19. *Ibid*., 1939: 16-7.

completed with only forty-six percent of the contract time having elapsed.[20]

During the first three months of 1940, work on the dam was limited to the placement of rock riprap on the upstream slope of the embankment. Preparations for closure of the temporary diversion channel and the diversion of the river through the outlet works began in early April. Placement of embankment materials was delayed until the diversion channel could be filled to the same level as the rest of the embankment. A temporary coffer dam was constructed to close the channel on April 18, and at noon on April 21, water flowed through the outlet works for the first time. Embankment placement operations over the entire embankment were resumed following the filling of the diversion channel, and continued until halted by the weather on November 9. At that time, the embankment was complete except for a small area adjacent to the uncompleted spillway gate structure.[21]

On September 3, 1949, Reclamation awarded the contract for completion of the road relocation around the reservoir site to the Wood, Morgan, and Burnett Construction Company of Durango, Colorado. The winning bid was $14,592.66. Work under the contract began on September 5, and was accepted on November 25, 1940. The contract called for the excavation of over 26,000 cu/yd of material, the placement of 16 culverts totaling over 600 feet, and the construction of four bridges. Two of the bridges were timber structures with 32-foot spans supported on steel bearing piles. The other two bridges were steel truss and I-beam structures with spans of 98-feet and 60-feet. The steel I-beams and trusses were salvaged from an existing bridge that had to be dismantled for the road relocation.[22]

Two other contracts were awarded in 1940. On February 16, Reclamation awarded the contract for the four high pressure gate assemblies in the outlet works to the Joshua Hendy Iron Works of San Francisco. Their bid was $21,490. The contract for the three, 37- by 19- foot radial gates for the spillway went to Philips & Davies, Inc. of Kenton, Ohio, on May 3, 1940. The bid for the radial gates was $22,000.

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20. *Ibid*., 1939: 3.
21. *Ibid*., 1940: 4-6.
22. *Ibid*., 1940: 28.

Installation of the high pressure and radial gates began in early 1941, with work completed by mid-year. Reclamation gave the contract for the three, 16,000 pound capacity, radial gate hoists to the Western Foundry Company of Portland, Oregon, on January 30, 1941, at a cost of $6,588. In a memo dated May 28, 1941, the construction engineer, C. A. Burns, reported to the chief engineer, S. O. Harper, that the control house was completed and all machinery tested and ready for operation.[23]

Embankment placement operations for the 1941 construction season began on June 17, with the embankment being "topped out" on July 25. Work under the primary contract was completed in October 1941. Reclamation removed construction of the parapet and curb walls on the dam crest from the primary contract to allow the embankment to settle completely before constructing these features.[24]

Vallecito Dam is a zoned earthfill structure 162 feet high and 4,010 feet long. The maximum width of the base from upstream toe to downstream toe is 900 feet, and the crest is 35 feet wide. The total volume of material in the dam embankment is 3,738,000 cu/yd.

The outlet works consist of a 350 foot long, twin section concrete conduit discharging into a 400 foot long, 15 foot wide open channel that empties into the spillway channel. The twin section conduit consists of two parallel 84-inch diameter, horseshoe conduits passing through the right abutment. Flows through the outlet works are controlled by four, 5-foot by 5-foot, high pressure gates located in a gatehouse buried in the dam embankment. Two of the gates are used for emergency operations with the other two gates used for regular operations. Access to the gatehouse is via the control house located on the dam crest. The maximum flow through the outlet works is 3,000 cubic feet per second (cfs).

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23. *The Reclamation Era*, March 1940: 86; June 1940: 171; March 1941: 80; Construction Engineer (C.A. Burns), to Chief Engineer (S. O. Harper). 28 May, 1941. Typewritten memo. Engineering Correspondence, Records of the Bureau of Reclamation. Records Group No. 115. National Archives and Record Administration, Rocky Mountain Region, Denver, Colorado.

24. "Project History," 1941-2: 17; Construction Engineer ©. A. Burns), to Chief Engineer (S. O. Harper). 5 July, 1941. Typewritten memo. Engineering Correspondence, Records of the Bureau of Reclamation. Records Group No. 115. National Archives and Record Administration, Rocky Mountain Region, Denver, Colorado; Construction Engineer ©. A. Burns), to Chief Engineer (S. O. Harper). 5 August, 1941. Typewritten memo. Engineering Correspondence, Records of the Bureau of Reclamation. Records Group No. 115. National Archives and Record Administration, Rocky Mountain Region, Denver, Colorado.

The spillway is a 2,300 foot long, curved, concrete lined open channel that varies in width from 50 to 125 feet. Flows through the spillway are controlled by three, 37-foot long and 19-foot high, automatically controlled radial gates. The total capacity of the spillway is 33,000 cfs. The spillway is located on the crest of the right abutment.

Vallecito Reservoir has a total capacity of 129,700 ac/ft with the water surface elevation at 7,665 feet above sea level. The surface area of the reservoir at maximum capacity is 2,720 acres.[25]

Distribution of project water is through a series of privately owned ditches and canals, all of which were constructed prior to the construction of Vallecito Dam. Most of the ditches and canals divert water directly from the Pine River. A few divert water from tributaries. There are almost 200 miles of ditches and canals, and 150 miles of laterals throughout the region that are served by project water. The capacity of the ditches and canals ranges from 260 cfs down to 1 cfs. In addition to the canals, there are five diversion dams along the Pine River downstream from Vallecito Dam.[26]

Post Construction History

Vallecito Dam was dedicated on September 14, 1941. Among those who spoke to the estimated 1,000 visitors as they enjoyed a barbecued beef dinner prepared by CCC enrolles, was Sinclar O. Harper, Chief Engineer of the Bureau of Reclamation, US Senators Alva Adams and Edwin C. Johnson, and Colorado Governor Ralph H. Carr. All who spoke paid tribute to Edward T. Taylor, a member of Congress who had been an undying supporter of western reclamation and who was instrumental in securing approval for the Pine River Project.[27]

Vallecito Dam was placed on operational status in early 1942, and the Government gave notice to the Pine River Irrigation District that repayment of the costs of construction would commence on December 31, 1943. Although storage of water was possible in 1940, the first

25. *Project Data*, 1027; United States Department of Interior, Bureau of Reclamation, *Vallecito Dam Flow Measurement and Weir Calibration*, by Roxanne George, (Bureau of Reclamation, May 1994), 2.
26. "Project History," 1943: 40-55; *Project Data*, 1026.
27. Trenam, M. E., "Vallecito Dam Nears Completion," *The Reclamation Era*, January 1942, 14.

water became available to irrigators in 1941.[28]

Following completion of work under the main contract, the primary contractor, the Martin Wunderlich Company, filed a claim against the Government seeking additional compensation for disputed items. The claim totaled $463,547.47. On December 29, 1942, in the Findings of Fact and Decision, the Contracting Officer found that of the 43 items listed in the claim, eight items were valid, and awarded Martin Wunderlich a total of $53,189.63. Claims for all other items were denied. On January 25, 1943, Martin Wunderlich filled an appeal with the Chief Engineer's office. After review, on February 22, the claim went to the Commissioner's office for further action. On July 7, 1943, an Administrative Finding by the Department of Interior affirmed the Finding of Fact and Decision, and dismissed the contractor's appeal.

On February 14, 1945, Martin Wunderlich filled a petition with the Court of Claims seeking compensation for 29 of the 33 items listed in the original action. Hearings in the case were set for June 11, 1945. During the hearing, the plaintiff presented the testimony of several witnesses, and the defendant, Reclamation, was allowed to cross examine the witnesses. Additional hearings were held in December 1945, November 1946, and April 1947. On June 2, 1947, the Commissioner of the Court of Claims closed the case and instructed counsel for both side to prepare and present briefs stating their cases. In early 1950, the Court of Claims ruled in favor of Martin Wunderlich and awarded $164,760.83 on contested claims, and $7,541.40 on uncontested claims. On August 14, 1950, the Department of Justice filed an appeal, and on November 26, 1951, the U.S. Supreme Court overturned the decision of the Court of Claims and upheld the original decision of the Secretary of Interior. The Martin Wunderlich Company was awarded a total of $60,762.64. In total, the appeals process took some nine years to complete.[29]

In late 1944, Reclamation emptied the reservoir to clean and repaint the trashrack. At that time the outlet system was inspected and found to be in excellent condition. The roadway across the dam crest was completed in 1955, and in 1957, the reservoir was filled to its full capacity for the first time. The project had begun to prove its effectiveness as a flood control

28. "Project History," 1941-2: 10,17.
29. *Ibid*., 1945: 24-5; 1947: 35-6; 1949: 23; 1950: 21-21A; 1951: 14; 1952: 14.

unit in 1941, controlling high spring runoff and preventing damage downstream, but it would be in the summer of 1957 that the dam proved it's greatest worth.[30]

Record rains in late July 1957, dropped over three inches of rain in less that 48 hours, filling the reservoir to it's maximum capacity and beyond. As the level of the reservoir rose, operators gradually raised the spillway gates to regulate the water level. As the water level passed the maximum design level, 7,665 feet above sea level, the automatic gate controls activated, and the radial gates opened wide, releasing a sudden flood of water. Downstream, the already swollen river could not handle the sudden flood, and the river left its banks. The high water caused the pipe that supplied the town of Ignacio with water to fail, leaving the town without a supply of fresh water and damaging the towns's filtration plant By the time the dam operators regained control of the spillway gates, the flow out of the reservoir had reached an estimated 12,000 cfs. At the peak of the incident, the water level in Vallecito Reservoir had reached 7,665.72 feet, almost a foot above the maximum designed capacity, and storage in the reservoir reached a level almost 2,000 ac/ft above capacity. Upstream from the dam, high waters washed out several bridges and roads, and flooded many homes.

Many people in the area criticized Reclamation for not allowing more room in the reservoir for flood control, and for the uncontrolled spill. The Bureau defended it's actions by pointing out that the available storage in the reservoir at the time of the incident had been more than sufficient to meet anticipated needs based on the historical data on rain fall and river flows. No one could have anticipated the record rains that fell in the days leading up to the uncontrolled spill. Investigations into reservoir operations during the incident showed that allowing the reservoir to fill to a level beyond it's design capacity had been the primary factor in creating the uncontrolled spill. But the Reclamation determined that the actions of the operators were justified. By allowing the reservoir to pass it's design capacity, the operators were able postpone increased releases of water until daylight hours, thus reducing the risk to those downstream. While damage downstream was heavy, no lives were lost, and the amount of damage was

30. *Ibid*., 1944: 26; 1957: 1, 4.

significantly reduced by Vallecito Dam.[31]

In April 1956, Congress approved extension of the Pine River Project as a participating project of the Colorado River Storage Project (CRSP). Reclamation developed CRSP as a way to meet flow requirements stipulated under the Colorado River Compact of 1923. CRSP planned for the construction of several large storage projects and powerplants. Participating projects would benefit by having a portion of costs allocated to irrigation paid by revenues from power generation. The Pine River Extension plan involved enlargement and extension of several major canals and irrigation ditches, construction of a new diversion dam, and construction of a new system of laterals for distribution of project water. The Pine River Extension was found infeasible and was removed from CRSP in 1968.[32]

In June 1962, the two emergency high pressure gates were closed and all flows diverted through the spillway so that the two primary high pressure gates could be removed for repairs. The work was completed and the gates were reinstalled and back in operation by the end of July.[33]

In Mid-1970, negotiations between Reclamation and the Pine River Irrigation District began for transfer of operation and maintenance of the dam and reservoir. The Pine River Irrigation District assumed operation and maintenance of Vallecito Dam and Reservoir on July 1, 1971.[34]

Prior to March 1973, there had been no significant structural or operational problems with the dam. Then, on March 29, 1973, the left wall of the spillway stilling basin failed and collapsed. The Pine River Irrigation District and Reclamation immediately took measures to resolve the problem. Because the incident occurred so near the beginning of irrigation season, temporary repairs were made and permanent repairs waited until the end of the season. On September 13, 1973, the White and Sons Construction Company was awarded the contract for

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31. *Ibid*., 1943: 12; 1957: 4, 64-80; United States Department of Interior, Bureau of Reclamation, "SEED Report on Vallecito Dam, Pine River Project, Colorado, Upper Colorado Region, (Denver, August 1987), C-1.
32. *Project Data*, 355, 1026; United States Department of Interior, Bureau of Reclamation, *The Colorado River Storage Project and Participating Projects*, (U.S. Government Printing Office, 1956), 5.
33. "Project History," 1970: 28.
34. *Ibid*., 1970: 29; 1971-3: 4.

the repairs. Their bid was $223,200, and work began on October 1, 1973. After repairs began, additional damage was found on both the left and right walls of the stilling basin, and $54,449 was added to the contract for additional repairs. Work on the repairs was completed on February 25, 1974.[35]

In early 1980, Vallecito Dam was selected by the Reclamation for study as a possible site for a small hydroelectric plant. In August 1980, Ptarmigan Resources and Energy, Inc., of Durango asked the Federal Energy Regulatory Commission for permission to investigate the possibilities of constructing a 2.3 megawatt (mw) hydro plant at Vallecito. In January 1981, Ptarmigan Resources and the Pine River Irrigation District reached a tentative agreement regarding construction and operation of the powerplant, and in March 1983, Ptarmigan Resources filed an application to construct the powerplant at Vallecito. Negotiations continued for several years until, June 3, 1988, when Ptarmigan Resources was issued a license agreement. Permission to begin construction of a 5 mw hydroelectric plant downstream from Vallecito Dam was given on June 21, with work beginning the following day. The powerplant and related features were designed and constructed by Obermeyer Hydraulic Turbines, Ltd. Construction and testing were completed in June 1991. Water for the powerplant is supplied via a penstock originating at the left conduit of the outlet works. Flow is controlled by a single 84-inch butterfly valve. The powerplant is owned by Ptarmigan Resources and operated by the Pine River Irrigation District.[36]

Settlement of Project Lands

Most of the lands within the boundaries of the Pine River Project were settled prior to construction of the Vallecito Dam. The first white settlers in the region entered the Pine River Valley in the late 1870s. As more and more people settled in the region, the most easily irrigated lands were occupied, forcing the construction of elaborate and extensive ditch systems to serve new lands. By the 1920s between 40 and 50 ditches diverted water directly from the Pine River

35. *Ibid*., 1971-3: 4, 21-2; 1974-6.
36. *Ibid*., 1980-1: 2, 23; 1983: 15; 1984: 12; 1988: 14, 34; 1991: 13; *Vallecito Dam Flow Measurement*, 6; Obermeyer, Wally, Owner-Ptarmigan Resources and Energy, telephone interview by author, October 28, 1994.

and its tributaries. Continued expansion of the irrigation systems was effectively halted in the 1920s when available water during the later part of the irrigation season was completely used by existing systems. The construction of the Vallecito Dam assured a reliable supply of water for the late irrigation season, and increased the irrigable acreage from less than 17,000 acres to more than 55,000 acres.[37]

In 1947, just over 32,000 acres of land were under irrigation. By 1970, this number had increased to almost 50,000 acres, with over 3,600 people being served by project water. In 1991, over 50,000 acres of land received project water with more than 6,200 people benefitting from the use of water supplied by the Pine River Project.[38]

Uses of Project Water

The primary use of water from the Pine River Project is the supplemental irrigation of over 40,000 acres of private lands, and over 15,000 acres of Indian owned lands. The primary crops grown on these lands are cereal and forage crops such as oats, wheat, barley, and alfalfa. In 1991, the total value of crops grown on lands served with project water was $7,187,238. Of lands served with project water, over 24,000 acres of private lands, and over 9,000 acres of Indian lands are used as irrigated pasture to support livestock operations.[39]

Vallecito Dam and Reservoir also play an important role in limiting flood damage along the Pine River. As of September 1992, flood control operations at Vallecito Dam prevented an estimated $493,000 in flood damage. In addition to benefits for flood control and irrigation, water from the dam is diverted via the outlet works for operation of a privately owned, 5 mw powerplant located just downstream from the dam.[40]

Vallecito Reservoir is a major recreational site serving southwestern Colorado. Recreational activities at the reservoir include camping, hunting, fishing, boating, and hiking. In 1991, visitor days at Vallecito Reservoir totaled over 300,000. Recreational activities at the

37. "Project History," 1943: 9; 1947: 50; *Project Data*, 1026.
38. "Project History," 1947: 85; *Project Data*, 1026; United States Department of Interior, Bureau of Reclamation, *Summary Statistics: Land, Water and Related Data*, (Denver Bureau of Reclamation, 1970), 236; (1991), 55, 59.
39. *Summary Statistics*, (1991), 229-30.
40. *Vallecito Dam Flow Measurement*, 6; United States Department of Interior, Bureau of Reclamation, Water, Land, and Cultural Resources Division, Office of Deputy Commissioner, Denver, Colorado.

reservoir are administered by the Pine River Irrigation District and the US Forest Service.[41]

Conclusion

The success of the Pine River Project can be calculated in several ways. Its development assured a reliable source of water for irrigation to both Indian and non-Indian farms and ranches, and increased the irrigable acreage from less that 17,000 acres to over 50,000 acres. As a flood control unit, operations at Vallecito Reservoir have prevented hundreds of thousands of dollars of damage to homes and crops along the Pine River. Each year, more than a quarter of a million people enjoy the recreational opportunities available at Vallecito Reservoir and contribute significantly to the economy of the area. The recent development of power facilities at Vallecito Dam has contributed to the success of the project in a way not originally envisioned.

No aspect of the operation of the Pine River Project has been less than an unqualified success. Relatively small when compared to other projects, the enormous success of the Pine River Project must surely place it as a successful project of Reclamation.

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.

41. *Summary Statistics*, (1991), 102; United States Department of Interior, Bureau of Reclamation, "Western Colorado Projects Review," (May 1982), 91.

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