Fryingpan-Arkansas Project

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The Fryingpan-Arkansas Project, or Fry-Ark as it is popularly known, is one of Colorado's largest and most complicated Reclamation projects, second only to Colorado-Big Thompson. Like the CBT, the Fry-Ark is a transmontane diversion project, delivering water from the snowy slopes west of the Continental Divide to the thirsty fields, municipalities, and industries of the Arkansas River Valley. The diversion of water from the western slope across mountain passes was a complicated undertaking of enormous size and scope: it required six storage dams; seventeen diversion dams and structures; hundreds of miles of combined canals, conduits, tunnels, and transmission lines; and two powerplants, switchyards, and substations.[1]

The history of Fry-Ark is interesting in that the project was authorized and constructed during a period of both ambitious Federal involvement in water projects and mounting distrust and opposition to expensive, complicated water projects. Fry-Ark took a lengthy ten years for authorization. Were it not for the firm yet cautious support of powerful Colorado congressman and chair of the House Interior and Insular Affairs Committee, Wayne Aspinall, the Fry-Ark might never have seen the light of day. Construction was also a lengthy process, as the beneficiaries waited another two decades before the entire project became operational.

Project Location

On the West Slope of the Continental Divide are the headwaters of countless rivers and streams that flow into the Colorado River. The two rivers directly involved in this project are the Roaring Fork, which flows in a northwesterly direction through the town of Aspen and into the Colorado, and the Fryingpan, which runs east-west into Roaring Fork. The rivers on either side of the Divide originate in the tops of the Rocky Mountains. Twin Lakes on the Eastern Slope,

1. U.S. Department of the Interior, Water and Power Resources Service, *Project Data* (Denver: Government Printing Office, 1981), 493.

for instance, lies adjacent to the Sawatch Range and seven of the state's fifty-three "Fourteeners", 14,000 feet or higher.

The Arkansas River originates at the Sawatch and Sangre de Cristo ranges, flows southward, and descends 6,600 feet for 150 miles before proceeding eastward through south central and southeastern Colorado. Sometimes by the time the river reaches Kansas most of the water has been used in Colorado. Any unused water eventually trickles into the Mississippi River, making a total journey of 1,459 miles. Its stream flow during the summer is quite low except after thunderstorms when its levels rise dramatically–an occurrence that would upset people on the Plains. From the edge of the Great Plains at Pueblo, Colorado, eastward the region is mostly sub-humid grasslands and semi-arid grazing lands. In this kind of environment, cultivation and settlement are wholly dependent on water from the river.[2]

Historic Setting

The varied landscape of the project area had been home to several native tribes and peoples. On the western edge, west of the Continental Divide in the region of the Colorado Plateau, Ute bands subsisted as hunters and gatherers. Among the Ute tribes in what would become the state of Colorado were the Mowatavi-watsiu, Uncompahgre, Muache, and Capotes, the latter two situated mostly in the southeast. In south and southeastern Colorado on the Plains ranged the Arapaho and, to a lesser extent, the Cheyenne.[3]

Before the mid-Nineteenth Century, few Europeans showed interest in the region that would become Colorado. Spanish explorers and traders entered the region intermittently in the Eighteenth Century and were later followed by famous American travelers like Zebulon Pike

2. Robert W. Durrenberger, "Arkansas River," in *The New Encyclopedia of the American West*, ed. Howard R. Lamar (New Haven, Connecticut: Yale University Press, 1998); Mark Pearson, *Colorado, Rivers of the Rockies* (Englewood, Colorado: Westcliffe Publishers, Inc., 1993), 29.
3. D. Callaway, J. Janetski, and O. C. Stewart, "Ute," in *Great Basin*, vol. 11, Warren L. D'Azevedo, vol. ed. (1986): 339.

(1805-07), John C. Fremont (1845-1853), Captain John W. Gunnison (1853), and others. Some published their findings in the West, but the vast region between the hundredth meridian and the Rocky Mountains–the Great American Desert, as it was known in the Nineteenth Century–remained unattractive to permanent settlement. The land had the disadvantages of being home to numerous native tribes and receiving too little rainfall to carry on agriculture without irrigation. Moreover, as Pike and his men quickly discovered, passage through the Rocky Mountains presented a sizable obstacle.

It took some time before enthusiastic promoters and hardy pioneers would change the public image of the Great Plains. Spanish-speaking New Mexican farmers came in 1851, but the real impetus to settlement in Colorado was the discovery of gold near present-day Denver in 1858. Many of the 50,000 gold seekers who came in 1959 would remain only for a short time, but many others stayed permanently. Already an established frontier outpost, Denver and the surrounding region grew exponentially after the Civil War as improved transportation encouraged mobility, migration, and enterprise. Railroad promoters and land speculators encouraged hardy settlers to make the Great Plains their home. Bolstered by the common perception that "rain follows the plow," farmers streamed into the region in the late Nineteenth Century, many taking advantage of liberal Federal land policies. By the time Colorado became a state, on the centennial of the signing of the Declaration of Independence, the population of Denver stood at 35,000, and a string of agricultural settlements had been established along the Arkansas River.[4]

The dramatic population influx of people of European descent spelled disaster for the indigenous peoples in the western portion of the state and on the Plains. As Indians lost their

4. W. Eugene Hollon, "Great American Desert," and Carl Ubbelohde, "Colorado," in *The New Encyclopedia of the American West*, ed. Howard R. Lamar (New Haven, Connecticut: Yale University Press, 1998).

homelands and were corralled into "reservations," white settlers thrived in a Colorado economy based on mining, ranching, timbering, and some agriculture. Mining towns like Gunnison sprang up and bustled with activity with the discovery of silver ore in the Rockies, and enterprising cattlemen established large, profitable cattle companies. The prosperity and optimism of the 1870s and 1880s, however, did not last as depression in the 1890s set in. Even into the Twentieth Century the economy languished–especially during the interwar years of the 1920s and 1930s–though there were intermittent spurts of profitable agricultural and oil production.[5]

Water shortages combined with depressed prices made agriculture a risky enterprise. For any farmer living on the Plains west of the hundredth meridian, agriculture in Colorado was dependent on irrigation. The Arkansas River was small compared to eastern rivers and simply did not consistently provide the flow necessary to water the thirsty fields, especially during periods of low rainfall. Even with these unpredictable and sometimes devastating realities, the counties on the Eastern Slope grew at a much faster pace than on the West Slope–but always with an eye for finding additional water to support agriculture and industry.[6]

Transmontane diversion projects have always been a source of bitter dispute in Colorado, and residents on the Western Slope have long resented the Front Range for its insatiable appetite for West Slope water. The cities probably had reason to lust after it not only because higher concentrations of people require more water but also because much of the water west of the Continental Divide flowed unused down the Colorado River.[7] Early on, west-east diversion efforts were a target of state, private, and federal enterprise. The cities of Denver and Colorado

5. Ubbelohde, 241-4.
6. Gunnison-Arkansas Project, Appendix A–General Discussion, November 1947, pp. 26-8, Project Reports, 1903-55 (PR 1903-55), 8NN-115-85-019, Records of the Bureau of Reclamation, Record Group 115 (RG 115), National Archives and Records Administration–Rocky Mountain Region (NARA).
7. Frank Milenski, *Water: The Answer to a Desert's Prayer* (Boone, Colorado: Trails Publishing, 1990), 27-8.

Springs undertook the Blue River project; Denver also built Dillon Reservoir, the Moffat Tunnel, the Vasquez Tunnel, and others for the purpose of conveying water from western Colorado to the state's capital. Private companies also financed the Otero Canal, Clear Creek Reservoir, and the Busk-Ivanhoe Tunnel. The first transmountain diversion project on the Arkansas was the Twin Lakes System, operated since 1935 by the Colorado Canal and later expanded as part of Fry-Ark.[8]

The largest transmontane project in Colorado was not the product of city or private interests but of the Federal Government. In the 1930s, the Bureau of Reclamation began work on the multi-purpose Colorado-Big Thompson Project (CBT), designed to generate hydropower and deliver water for irrigation, municipal, and industrial use. CBT diverted water from the west slope to the east, using a series of diversion dams and pumping plants and tunnels to deliver supplemental water to farms and urban areas in northern Colorado. The project would contribute mightily to the economy and growth of the Front Range.[9]

In many ways, CBT was a precursor and a project similar in size and scope to Fry-Ark. Its authorization and construction had a life span almost as long, as it did not stand completed until 1956, more than twenty years after it had been conceived. CBT diverted more water, irrigated more land, and provided more municipal water than did Fry-Ark, but in theory the two projects aimed to do the same thing. Even the forces that combined against CBT foreshadowed resistence from the Western Slope that would threaten the Fry-Ark. In the battle over CBT, the National Park Service feared the project would adversely impact the natural scenery and beauty of Rocky Mountain National Park. Citizens of the West Slope, too, got involved on the grounds

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8. Milenski, 28-9.
9. Robert Autobee, "Colorado-Big Thompson (second draft)," Bureau of Reclamation History Program, Denver, Colorado, 1994, 2.

that water from the Colorado River did not belong to residents of the Eastern Slope; as one woman pragmatically stated, "if God had wanted crops grown there [northern Colorado] he would have provided the water to do it with."[10] This was precisely the sentiment of many West Slope residents regarding the proposed Fry-Ark Project.

Thus, the history of water in Colorado is in many ways a tale of two regions. The East Slope needed additional water for irrigation, municipal, and industrial purposes; the West Slope had plenty of water but most of it flowed downstream unused. But if the Western Slope had the water, the Eastern Slope had the arable farmland and land ideally suited to support a large population. While the Front Range (and the area along the Arkansas River) had flourished, the Western Slope had endured a cyclical, boom-and-bust economic history.[11]

Project Authorization

The dream to supplement the Arkansas River with water from the Western Slope took shape as the Gunnison-Arkansas Project, soon to be revised as the smaller-scale Fryingpan-Arkansas Project.

The over-appropriation of water from the Arkansas had long been a major concern, and in the 1920s local farmers and irrigation promoters began to envision a large scale trans-mountain diversion project to remedy the situation. They justified the developments not just on irrigation but on power, municipal water, and other "associated" needs, such as flood control. Storage reservoirs along the Arkansas River would tame the river's flow and prevent the damage incurred from flooding as occurred in June 1921 when high water flows killed 78 people and created an estimated $19 million in damages. Ditch companies even began to investigate the

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10. See Autobee, 8-13.
11. Gunnison-Arkansas Project, Appendix A–General Discussion, Nov. 1947, pp. 26-7, PR 1903-55, RG 115, NARA.

possibility of a trans-mountain diversion project but nothing came of it because of intrastate misunderstandings and the lack of resources. So in 1936, at the urging of locals, Reclamation began to explore ways to meet the future needs of southeastern Colorado. Known as the "Arkansas Valley Investigation," these studies continued under the direction of Reclamation engineers into the 1940s and 1950s.[12]

Reclamation drew up the proposed Gunnison-Arkansas Project, a "comprehensive plan of development" that would divert an astonishing 800,000 acre-feet of water per year from the Gunnison River. Locals, supported by the secretary of the interior, spoke wide-eyed of its potential to change the face of the Arkansas River Valley, but the very size of the design made the Western Slope livid. To appease Western Slope interests, Reclamation tabled the larger plans and focused on the first phase of construction–the diversion of water from the Roaring Fork and Fryingpan rivers. The new plan called for about fifty miles of collection canals and tunnels, a six-mile tunnel across the Continental Divide, and a dam and reservoir at Aspen–all on the Western Slope. The plan was to channel the water to a series of dams, powerplants and switchyards, and forebays on the Eastern Slope. Early estimates placed its construction schedule at ten years. Since the new proposal, known as the Fryingpan-Arkansas Project, was much smaller in scale–69,200 compared with 800,000 acre-feet–its promoters were hopeful it would be received favorably by Congress.[13]

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12. Eric B. Kollgaard and Wallace L. Chadwick, eds. *Development of Dam Engineering in the United States* (New York: Pergamon Press, 1988), 666; "Project History, Fryingpan-Arkansas Project," Vol. 1, 1963, p. 1, 8NN-115-90-039, Records of the Bureau of Reclamation, Record Group 115 (RG 115), National Archives and Records Administration–Rocky Mountain Region, Denver, Colorado (NARA). A report of the flooding is in U.S. Department of the Interior, Bureau of Reclamation, Initial Development, Gunnison-Arkansas Project, Roaring Fork Diversion, Colorado: A Potential Transmountain Diversion Project, Project Planning Report No. 7-8a.49-1, January 1950, 6-12.
13. Gunnison-Arkansas Project, Colorado - Appendix A General Discussion, November 1947; Gunnison-Arkansas Project, Colorado - Appendix B Water Supply, March 1948; Preliminary Geologic Report, Pueblo Damsite, Geology Report No. 2, Fryingpan-Arkansas Project, Colorado, May 1, 1951, PR 1903-55, RG 115, NARA. Gunnison-Arkansas Project, Roaring Fork Diversion, January 1950, 13-5, 19. Sturgeon, 54-5.

It was unclear just how much water would be available to divert to the Eastern Slope. Reclamation's 1950 report plainly stated that water on the West Slope was "not overappropriated"–of the approximately 3,855,375 acre-feet allocated to Colorado from the Colorado River and its tributaries only about 1,600,000 of it had been put to productive use. Fry-Ark would take 69,200 acre-feet from the upper Roaring Fork River Basin and channel it across the Continental Divide to holding reservoirs along the Arkansas River. But opponents believed the entire project was based on the "assumption" that water was actually available for East Slope consumption, and even if water on the Western Slope had not been appropriated, it ought to be kept where it originated to aid in the future growth of that region.[14]

Before congressional committees, promoters appealed to the "desperate" situation in Colorado, to the plight of the farmer and the growing population of the Front Range. They also showcased Fry-Ark as the only way to remedy the current situation. In 1953, for instance, John Edgar Chenoweth claimed the project would be the only means of providing desperately needed water for Pueblo, Colorado, "the second largest city in Colorado and the industrial center of our State." At hearings in 1955, he again emphasized the "desperate shortage of water" and of "one of the worst droughts in history."[15]

Boosters flexed their muscles because they believed the project was in the best interest of the state. After Fry-Ark had been officially drawn up in 1951, they could now argue that it was in the best interest of the Western Slope as well, since it would now have a storage reservoir of its own. But these same promoters underestimated the feeling on the West Slope, particularly in

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14. Gunnison-Arkansas Project, Roaring Fork Diversion, January 1950, 38, 44, 45.

15. U.S. Congress, House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, 83rd Cong., 1st sess., June 8, 1953, PR 1903-55, RG 115, NARA; Congress, House of Representatives, Congressman Chenoweth of Colorado speaking on behalf of the Fryingpan-Arkansas Project, HR 412, 84th Cong., 1st sess., May 9, 1955, box 20, Wayne N. Aspinall Papers (Aspinall Papers), Special Collections & Archives, Penrose Library, University of Denver (DU).

the sparsely populated Pitkin County where the Aspen Reservoir was to be built. Opposition to Fry-Ark was not based on some idealistic desire to protect the land–as had partly been the case with CBT–but on the simple notion that water that fell on the Western Slope belonged to people who lived on the Western Slope. It was a matter of principle.

More than local residents of Pitkin County opposed the Fry-Ark legislation. Each time the project came up for congressional consideration, first in 1952 when it failed to get committee approval until its eventual passage in 1962, it met determined opposition in the House and Senate. Politicians from the East and the West, including Californians who feared that less water in the Colorado River meant less water for their consumptive use, voted against it when the project first came up for a vote in 1954 (though the Committee on Interior Affairs reported it to be "sound from an engineering, economic and financial standpoint" and "urgently needed"[16]). That year, the congressional "minority report" headed by John P. Saylor, congressman from Pennsylvania and opponent of Reclamation, articulated some of the central concerns–erroneous information, extended repayment schedule, excessive subsidies for irrigation, engineering and financial feasibility, local opposition. Opponents feared that there was no guarantee that estimated total costs would not exceed the projected $172,898,000 price tag. As Congressman D. S. Saund of California reminded his colleagues in 1958, "please remember the Colorado Big Thompson Project, which had an initial cost at the time of authorization of $44 million, but an eventual cost of $125 million." Could not the Fry-Ark be the first step in the eventual implementation of the entire Gunnison-Arkansas Project?[17]

Mostly because of the feeling of his constituents on the West Slope, congressman Wayne

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16. Quoted in Carol Jean Drake Mehls, "Into the Frying Pan: J. Edgar Chenoweth and the Fryingpan-Arkansas Reclamation Project" (Ph.D. dissertation, University of Colorado at Boulder, 1986), 143.
17. "Minority Report on the Fryingpan-Arkansas Project, Colorado (HR 236)"; D. S. Saund to "Colleague," Aug.ust18, 1958, box 20, Aspinall Papers, University of Denver.

Aspinall was lukewarm in his backing of the Fry-Ark. A champion of water reclamation and an assiduous defender of projects in his own district, the Fry-Ark Project put him in a difficult, if not contradictory, position. On one hand, the last thing the majority of his constituents on the Western Slope wanted to see was the diversion of their water to people on the other side of the mountains. But as Stephen Sturgeon has noted, Aspinall could not have expected support in Congress if he did not give his consent to water projects outside his own district. That he survived this walk on a political tight rope–his constituents nearly ousted him from office in 1954 because of his support of the project, while diehard proponents of Fry-Ark pointed to Aspinall's lukewarm support of Fry-Ark as one reason for its repeated defeats in Congress–is testament to his political acumen.[18]

Aspinall had several reasons to be skeptical of Fry-Ark. In a speech in 1954, he said he could only reluctantly support the project because he had wanted to first see passage of the Upper Colorado River Storage Project. He also could not conclusively state that "there will be water available to insure the trans-mountain delivery of the amount of water proposed." Yet each time it came up for a vote he supported it, albeit lukewarmly, because he believed it to be in the best interest of his state.[19]

Each time the Fry-Ark came before congress, it met defeat. Key congressmen blocked its passage each time, and sometimes its sponsors could not even get it listed on the House or Senate agenda. Aspinall blamed the Republicans, particularly their refusal "to support a Democratic proposal to build several dams at Hell's Canyon in Idaho, thus angering the Speaker of the House, who was a Democrat." But others believed that Aspinall's reticence ("silent consent") in some of the floor debates did the legislation in. In 1956, Fry-Ark had Aspinall's

18. Sturgeon, 54, 58-60.
19. Speech to chairman, box 20, Aspinall Papers, University of Denver.

tacit support, but his first priority was to get passage of the Colorado River Storage Project. However, Fry-Ark did not have his wholehearted support, though he voted for it when it came up for a vote and was defeated. Yet even after passage of the Colorado River legislation in 1956, Aspinall again angered proponents of the project when in 1957 he did not take an active part in its defense.[20]

For Aspinall's part, he claimed that his actions had been consistent, given the division on both sides of the issue. Aspinall felt it his duty to "conform to the policy established by the spokesmen of the state" (the project was endorsed by the governor of Colorado, the Colorado Water Conservation Board, the Colorado River Conservancy District, the Southwestern Colorado Conservancy District, and other noted interests), yet he also felt it his duty to work in the best interest of his constituency on both sides of the Continental Divide. Leadville, for instance, stood to gain from the project because for so many years it had faced difficult economic conditions. He refused to take a definitive stand one way or the other until both sides could reach an agreement. Success was also dependent on the recognition of water rights by the courts and an interstate water compact.[21]

The agreement was made on April 30, 1959, when both sides signed a compromise pact. The main agreement centered on the decision to abandon the controversial dam near Aspen for a larger one on the Fryingpan River. With a storage capacity of 100,000 acre-feet, Ruedi Dam and Reservoir would actually store more than the Eastern Slope would carry across the mountains and the surplus could be used on behalf of Western Slope interests. The agreement between major interests on both sides–although still not acceptable to some–was a turning point.

20. Sturgeon, 59-60; Aspinall to Joseph C. Weber, June 7, 1954; Aspinall to Gilbert E. Gregg, July 28, 1958, box 20, Aspinall Papers, University of Denver.

21. Aspinall to Mrs. Clarence A. Peregrine, Jan. 29, 1957; Aspinall to Raymond Tex Roberts, February 27, 1958; News release, Joint Statement of Colorado House Members on the Fryingpan-Arkansas Project," August 21, 1958, box 20, Aspinall Papers, University of Denver.

Colorado's most influential politician and chairman of the House Interior and Insular Affairs Committee, now stood solidly behind it without feeling he was betraying his constituency. "Since there has been an agreement [on the Fry-Ark Project], and I am convinced that it is good for western Colorado as it is for eastern Colorado, then I am of course doing what I can to see that favorable consideration is given this matter."[22]

With the compromise in place, proponents faced much less resistence from the Western Slope. Interestingly, in May 1961 the *Aspen Times* reversed its position and confessed to being wrong about Fry-Ark and the original proposal to build a reservoir at Aspen, because it would have provided continual summer flows on Roaring Fork River. But other Western Slope interests refused to retract their original distrust and outrage. As the associate editor of the *Daily Sentinel* noted, "there is a great deal of misinformation, and there is not any amount of accurate information in Pitkin County, on the Fryingpan." Aspinall, no doubt, would have liked to have had full support from the Western Slope on this matter, but as a seasoned politician he also recognized the impossibility of pleasing everyone all of the time. "I don't know whether the people who are doing this are John Birchers or not," he wrote back to the associate editor, "but I do know that they are people who are thinking only of their own welfare and they do not bother me at all."[23]

Timing continued to plague Colorado's efforts to secure authorization for Fry-Ark. As had happened several times before, there was not enough time left in the session to consider the legislation on the floor. Aspinall blamed "those handling the reports"–particularly the

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22. Aspinall to Adelaide Cayton, May 8, 1962, box 49, Aspinall Papers, University of Denver; Sturgeon, 61.
23. William H. Nelson, Grand Junction, Colorado, to Aspinall, June 17, 1961; Aspinall to Nelson, June 19, 1961, box 89, Aspinall Papers, University of Denver.

Department of the Interior–for delivering the reports too late into the legislative season.[24]

Another more serious monkey wrench was other legislation pending in Congress. Reportedly, the problems lay with New Mexico Senator Clinton Anderson, now chair of the Senate Interior Committee, with relations between Colorado and New Mexico over water rights. Aspinall called it "a real water war" and lamented that a resolution could not be reached between the two states. New Mexico's San Juan-Chama passed the Senate and House in the summer of 1961, but on the state's other project, the Navajo Indian Irrigation Project, Aspinall insisted that the Navajo's waive their Winters Doctrine water rights. He also insisted on an amendment in the House bill that would make water shortages available to all users. The congressman's actions angered Navajo leaders and was one reason why Fry-Ark was held up in 1961. Details like these–timing, feuding with New Mexico, etc.–struck fear in the hearts of those who had supported a diversion project for years. "We in Pueblo, who have been working and urging the passage of the Frying Pan bill for many years are becoming anxious in fear that some unexpected development may block passage of this bill." These feelings were intensified by the realization that if the project did not receive authorization the third time it came up for a vote, it would never pass.[25]

In 1962, proponents of Fry-Ark launched a full-scale campaign to push the water project through Congress. Aspinall pledged to lead a "do or die" campaign, and the Colorado water lobby led by Felix Sparks actively courted House members to support the project. Fry-Ark proponents faced some minor setbacks–such as when the House Rules Committee temporarily refused to consider the legislation–but these were minor. Aspinall pushed for the Navajo-San

24. Aspinall to Preston Walker, Grand Junction, February 8, 1960; Aspinall to George Everett, Salida, Colorado, May 31, 1960; Aspinall to Emanuel Stein, June 8, 1960, box 81, Aspinall Papers, University of Denver.
25. Schulte, 105-7; Aspinall to Eugene A. Bond, Leadville, Colorado, April 12, 1960, box 81; Aspinall to Robert N. Trevallee, Denver, August 25, 1961; Aspinall to John Bonforte, Pueblo, Colorado, December 27, 1961, box 89, Aspinall Papers, University of Denver.

Juan Project before his own and was successful in loosening the Fry-Ark from the fate of the Navajo Project. In a show of bipartisan support, the entire Colorado congressional delegation united in support of the "new and improved" Fry-Ark—"physically different, economically and financially improved and enjoys much greater support than the Fryingpan-Arkansas Project previously considered."[26] The House voted on it on June 13, the Senate on August 7, and the president signed it a week after that. The wait for authorization was finally over.

The authorization of Fry-Ark was a long, exhausting process–Chenoweth said it took a lot of "blood, sweat, and tears of the people"[27]–for those who promoted it and looked to it as a salvation of southeastern Colorado. Its long history was only the beginning; the construction phase of the project would continue for over twenty years. During this time, the shape of Fry-Ark underwent a metamorphosis just as it had during the debate over its authorization.

Construction History

Probably about a dozen contracted work projects, large and small, kept crews busy at any given time between 1964 and the early 1980s. The Continental Divide marked the division of labor: on the Western Slope Ruedi Dam and Reservoir and the collection system stored and delivered water to a series of dams, conduits, and canals on the Eastern Slope. The construction proceeded, roughly, beginning at the higher elevations on the West Slope, continuing on the collection system connecting the two sides, and capping off with the dams, reservoirs, and powerplants on the Eastern Slope. It is in this progression that we can best conceptualize the construction of Fry-Ark.

Initially the construction schedule divided the project into four areas–the Western Slope, Leadville/Buena Vista, Buena Vista/Salida, and Arkansas Valley areas–with an estimated

26. Schulte, 106-8; Sturgeon, 65-7 (quote from p. 67).
27. "Project History, Fryingpan-Arkansas Project," Vol. 19, 1981, p. 14, RG 115, NARA.

duration of thirteen years. Not only did construction last longer than projected, but many of the original features underwent name changes, modifications, or deletions. Of the six planned powerplants, for instance, only two were actually built. Even the location of some of the temporary field offices would change. Of course, in a project of this size and complexity, it is understandable that construction would not follow the original plans, especially given the shape and form the environmental movement gave to the project.[28]

Construction of Fry-Ark was a sizable and labor-intensive effort. Project manager J. L. Ogilvie, who made his base in Pueblo, Colorado, was surrounded at any given time by a few hundred government employees and a few more contract employees working on the project. Army personnel from nearby Fort Carson worked on a limited basis on some of the features of the Fry-Ark. Reclamation also brought in young men and women from the Youth Conservation Corps Work Program beginning in the summer of 1974 to do light labor on project features. They worked mostly on small, non-risk tasks such as construction of trails or irrigation for "wildlife enhancement."[29] One by one, construction crews completed project features, and in the end the project consisted of the six storage dams (Ruedi Dam, Sugar Loaf Dam, Pueblo Dam, Mt. Elbert Forebay Dam, Twin Lakes Dam, Clear Creek Dam); diversion dams and structures (Chapman, Southfork, Fryingpan, Ivanhoe, Lily Pad, Halfmoon, North Cunningham, Carter Creek, Sawyer, Midway Creek, Middle Cunningham, Mormon Creek, No Name Creek, Hunter Creek, North Fork, South Cunningham Creek); 4.3 miles of canals; 281.6 miles of conduits; two powerplants (Mt. Elbert Pumped-Storage Powerplant, Otero Powerplant); 11.6 miles of transmissions lines; two switchyards; two substations; and 27 miles of tunnels.[30]

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28. "Fryingpan-Ark Project Plans," [1963], box 129, Aspinall Papers, University of Denver.
29. "Project History, Fryingpan-Arkansas Project," Vol. 13, 1975, p. 63, RG 115, NARA.
30. *Project Data*, 493-9.

The Western Slope

The first features of Fry-Ark to get underway were Ruedi Dam and Reservior. Ruedi Dam was the first structure of the Fry-Ark system because the West Slope demanded a storage reservoir of its own before water from the upper tributaries of the Fryingpan River, above Ruedi, flowed in the Arkansas River. In 1964 Reclamation awarded six contracts to the Puget Sound Bridge and Dry Dock Company in connection with Ruedi Dam for the construction of field offices, the relocation of a county road and telephone facilities, the erection of a right-of-way fence near the dam, and the construction of the dam itself. That summer Aspinall participated in the groundbreaking ceremonies and the contractor set up operations.[31]

But like the original damsite at Aspen, Ruedi was controversial from the beginning. In 1963, the Rocky Mountain Association of Geologists questioned the suitability of the site location (apparently its foundation contained salt deposits which could turn the Fryingpan River saline) and recommended an alternative site eleven miles downstream on the Fryingpan River. If not on the Fryingpan, then Reclamation could construct two reservoirs, one on the North Fork and the other on Chapman Gulch. Reclamation hired a panel of professional geologists who inspected the site and reported it to be a satisfactory location for an earthwork dam of this sort. Other disagreements were over specific details of construction or administration. Recreational facilities is one example. In 1964, Wayne Aspinall complained that the Department of the Interior had proposed only providing camping facilities at the reservoir, since "this area will be visited by people who will want good motel or lodge accommodations, which should be furnished by commercial enterprise."[32]

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31. "Project History, Fryingpan-Arkansas Project," Vol. 2, 1964, pp. 5-8, 11, RG 115, NARA.

32. William H. Nelson, "Ruedi Dam Is Headache For Both Engineers, Politicians," *Sentinel*, Aug. 28, 1963; Bert Hanna, "Panel Rejects Arguments on Ruedi Damsite," *Denver Post*, Sept. 16, 1963, in box 129, Aspinall Papers, University of Denver. Also Aspinall to Udall, February 7, 1964, box 156, Aspinall Papers, University of

(continued...)

Despite the efforts to construct the project's features in areas of low population, the impact of Fry-Ark hit close to home for the people who resided in the area. Residents in Aspen vigorously opposed a maintenance facility road "through one of the loveliest residential areas in Aspen"–a road, they believed, designed to cater to those who planned to develop the area in the future. Residents in the Ruedi area expressed concern over the dust problem due to road construction and property-rights issues.[33]

Notwithstanding these concerns, construction proceeded on schedule. Concrete was obtained from aggregate pits near the towns of Basalt and Aspen and delivered to the project site by trucks. Excavation of the grout cap trench on the right abutment of the dam began in early 1966; also that year crews continued or began to place material in zones 1, 2 and 3, and by July they completed the first stage of the concrete for the outlet works intake structure. Later that year, crews excavated at the spillway chute and lined the auxiliary outlet works tunnel. The embankment topped out in October 1967. Some delays were occasioned due to harsh winter conditions and damages to the left bay and right bay of Outlet Works Stilling Basin.[34] But by 1970 Ruedi Dam and the appurtenant features stood completed. In subsequent years, construction included only a few odds-and-ends tasks like repainting and repairs to the elevator at the dam. Eventual cost of the dam and reservoir totaled approximately $14 million. The Southeastern Colorado Water Conservancy District assumed $8 million of the cost, to be paid back by revenue generated from the sale of water on the Western Slope.[35]

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32. (...continued)
Denver.
33. James S. Dodge to Aspinall, July 19, 1966, box 216, folder 39D; Jim Crowley, Eagle County, to Aspinall, October 27, 1964, box 156, Aspinall Papers, University of Denver.
34. "Project History, Fryingpan-Arkansas Project," Vol. 2, 1964, p. 11; "Project History, Fryingpan-Arkansas Project," Vol. 4, 1966, pp. 27-32; "Project History, Fryingpan-Arkansas Project," Vol. 7, 1969, p. 4, RG 115, NARA.
35. "Project History, Fryingpan-Arkansas Project, "Vol. 18, 1980, p. 7, RG 115, NARA; Milenski, 31.

None of the water resting in the Ruedi Reservoir makes its way across the Divide and into the Eastern Slope region; diverted water is collected from the creeks and streams above the Ruedi Reservoir through a network of diversion dams, conduits, canals, and tunnels. The North Side Collection System intercepts water from the upstream tributaries of the Fryingpan River; the South Side Collection System gathers water from Hunter, Midway and No Name Creeks just above the Roaring Fork River Basin and from the southern tributaries of the Fryingpan River. Hunter, Chapman, and South Fork tunnels channel South Side water to where it meets with diverted water from the North Side Collection System on Marten Creek. From there the water makes its ascent into the Eastern Slope via the Charles H. Boustead Tunnel.

In 1965 preparations were made to begin construction on the collection systems. Personnel pored over aerial topographic mapping of the collection system and, according to official reports, developed a new method of"adjusting" traverses located within the collection system. Field personnel also investigated various site locations, interviewed "interested" persons, and prepared the designs, layouts, and estimates. In February 1966 they submitted the reports and data to the construction engineer. That year, 1966, after they had completed preparations on the tunnel that was to cut the Continental Divide (the Divide Tunnel, later to be renamed the Charles H. Boustead Tunnel) and several features on the North Side Collection System, the physical labor began. The only (minor) disruption on record was an eleven-day "wildcat strike" at the Chapman and South Fork Tunnels.[36]

The South Side Collection System progressed more rapidly than the collection system on the north side. Winston Bros., Foley Bros., Hurley Construction, and Frazier-Davis Construction based in Minnesota received the winning bid for $17,556,167 to construct the Divide, South

36. "Project History, Fryingpan-Arkansas Project," Vol. 3, 1965, pp. 5-6; "Project History," Fryingpan-Arkansas Project, Vol. 4, 1966, p. 28, RG 115, NARA.

Fork, and Chapman Tunnels, the diversion dams, and appurtenant structures. In 1969 tunnel excavation was delayed for two months because of water leakage. After crews stabilized the rock, excavation continued and holed through on June 15. A few months later crews began to line the tunnel with concrete. By the end of 1970, nearly half of the south side features had been completed compared to only 12 percent of the North Side Collection System.[37]

The features of the North Side Collection System included Carter, Mormon, Cunningham, and Nast tunnels. The contract to build the Nast (previously Ivanhoe) Tunnel and the Lily Pad Diversion went to Peter Kiewit Sons, Co., from Nebraska. Boring holes through the granite rock of the Continental Divide, however, was no simple task. Peter Kiewit Sons, Co., used a new boring machine manufactured by Wirth-Erkelenz in Germany to accomplish the job. Thirty feet long, ten feet in diameter, and hydraulically powered by three 200-horsepower motors, the machine drilled through rock with a compressive strength of up to 33,500 psi. But even if the hardness of the rock presented few problems for the boring machine, the "softness of the rock at faulted zones, blocky ground, and areas of decomposed rock" caused delays in operation. Finally, in 1973, the tunnel was completed with the distinction of being "the first tunnel in the United States machine bored through granite rock."[38]

Some of the tunnels were laid near the surface and consisted of concrete piping in a ditch that was later filled in, but most of them, like the Nast Tunnel, ran through the mountain passes. Construction was tricky because access to the remote work sites was rather difficult. Sometimes access roads were made available to the work sites. But work had to proceed from one end or one section of the tunnel to the next because the tunnel was the only means of access. Deep

37. "Project History, Fryingpan-Arkansas Project," Vol. 7, 1969, p. 4; "Project History, Fryingpan-Arkansas Project," Vol. 8, 1970; "Project History, Fryingpan-Arkansas Project," Vol. 9, 1971, p. 9, RG 115, NARA.
38. "Project History, Fryingpan-Arkansas Project," Vol. 8, 1970, pp. 2, 43; "Project History, Fryingpan-Arkansas Project," Vol. 9, 1971, p. 10; "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, p. 19; "Project History, Fryingpan-Arkansas Project," Vol. 11, 1973, p. 58, RG 115, NARA.

snow packs during the winter months especially made travel into the remote reaches of the mountain passes very difficult. Sometimes it was necessary to blast the snow pack above the road in order to facilitate access on the roads during the springtime. This line of work proved fatal in 1976 when two men helicoptered to Mt. Nast above the Boustead Tunnel access road and one of them, Donald A. Grant, got caught under a cornice and died in a small avalanche.[39]

The contractor completed South fork tunnel in 1969, while Carter and Mormon tunnels and other features on the North Side Collection System were finished in 1979. The most significant feature of the collection system was the newly christened Charles H. Boustead Tunnel, finished in 1971. Now operation could begin immediately–project personnel anticipated the diversion of 32,000 acre-feet in 1972, of which possibly 20,000 acre-feet could be made available to the Southeastern Colorado Water Conservancy District. The East Slope would finally begin to feel the benefits of Fry-Ark. On June 29, 1972, 500 people gathered to celebrate the tunnel's dedication, with the Secretary of the Interior, the governor of Colorado, members of Colorado's congressional delegation, and other dignitaries in attendance.[40]

The Eastern Slope

Across the Divide, about fifteen miles southwest of Leadville on the upper reaches of the Arkansas River, was the chosen site for Sugar Loaf Dam and Turquoise Lake. It was at this point that the water from the Boustead Tunnel emptied into the first of several storage facilities on the Eastern Slope. The Divide Drilling Company of Granite, Colorado, won the bid to drill holes at the Sugar Loaf damsite. Reclamation employees from the Buena Vista Field Office also drilled holes and conducted water tests and several surveys on the drill holes, traverses, existing

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39. "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, p. 19; "Project History, Fryingpan-Arkansas Project," Vol. 14, 1976, p. 61, RG 115, NARA.
40. "Project History, Fryingpan-Arkansas Project," Vol. 9, 1971, p. 7; "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, p. 16, RG 115, NARA.

laterals, and road relocations. Beginning in 1964, the same procedures and some of the same personnel also drilled, surveyed, and studied the damsite at Twin Lakes about ten miles downstream.[41]

As with the features on the Western Slope, work on Sugar Loaf Dam proceeded quickly in 1966, 1967, and 1968–stripping of the right abutment; clearing county road areas; excavation on abutments and outlet channels; placement of compacted earthfill; placement of concrete in the gate chamber, intake structure, and stilling basin of the outlet works. By 1970, these features were nearly completed and operations would soon turn over to O&M. Among the few tasks left were the relocation of a county road, and the installation of a guard fence, safety floatline, and buoy at Sugar Loaf Dam.[42]

The features immediately downstream Sugar Loaf Dam in the Twin Lakes–the Mt. Elbert Canal and Halfmoon Diversion Dam, Mt. Elbert Forebay, and Mt. Elbert Pumped Storage Powerplant–were not even under construction until the early 1970s. There was a reason for the slow progress on the powerplant. Appropriated funding was sufficient to build a 100-megawatt plant but not enough for a 200-megawatt plant. Reclamation constructed the powerplant in "stages," beginning with the 100-mw plant, with plans in the future to solicit more appropriation for the second 100-mw unit. The powerplant was to pump water for electric generation, "the first pumped-storage installation designed and built by the Bureau of Reclamation exclusively for power generation." In addition to the actual powerplant, contracted crews also began work on penstocks, forebay-reservoir channel, inlet-outlet structure, gate and dike, and an access

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41. "Project History, Fryingpan-Arkansas Project," Vol. 2, 1964, pp. 6, 11, 14; "Project History, Fryingpan-Arkansas Project," Vol. 3, 1965, p. 6, RG 115, NARA.
42. "Project History, Fryingpan-Arkansas Project," Vol. 4, 1966, pp. 27-32; "Project History, Fryingpan-Arkansas Project," Vol. 9, 1971, pp. 9, 11, RG 115, NARA.

road.[43]

Martin K. Eby Construction Company, Inc. and Equipment Rental and Sales Company, Inc., received the winning bid to construct the powerplant; Allis Chalmers Manufacturing Co. of Pennsylvania produced the Pump Turbine for the powerplant, and Westinghouse Electric Corporation of Denver, Colorado, the generator-motor. In 1973 and 1974 the contractor placed concrete, backfill, and impervious material on the substructure of the powerplant–a total of 1,340,242 cubic yards. By 1976 the original work of the contract was completed, but the contractor signed a new contract to work on the cooling water system and replace window units. More concrete was placed around the turbine spiral case and metalwork for the motor, also operation of the pumps. In the early eighties, work continued on landscaping and parking facilities, the modification of penstocks and installation of electrical wiring, and the testing of the units.[44]

From looking at the powerplant's exterior, passers by would be hard pressed to identify its function. Its thirteen stories are mostly underground and the structure itself blends in with the rock and soil of the shoreline. The first and only visible level served as a visitor's center–"the key interpretive site for the Fryingpan-Arkansas Project"[45]–until a transformer fire in the late 1990s contaminated it and forced it to close.[46]

Associated with the powerplant was the Mt. Elbert Switchyard, Mt. Elbert Forebay, and Mt. Elbert Conduit and Halfmoon Diversion. In 1976 work began on the Mt. Elbert Switchyard,

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43. "Project History, Fryingpan-Arkansas Project," Vol. 5, 1967, p. 11; "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, pp. 16, 19, RG 115, NARA.
44. "Project History, Fryingpan-Arkansas Project," Vol. 11, 1973, p. 8; "Project History, Fryingpan-Arkansas Project," Vol. 12, 1974, p. 9; "Project History, Fryingpan-Arkansas Project," Vol. 14, 1976, pp. 5, 16, RG 115, NARA.
45. U.S. Department of the Interior, Bureau of Reclamation, Fryingpan-Arkansas Project, Colorado, *Final Environmental Impact Statement*, Vol. 2. 1975, 8.
46. Gene Price, phone interview with the author, July 26, 2006.

with Talon Construction Company receiving the bid for just over $2 million. From the powerplant a 230-kilovolt transmission line connected to the East Slope Power System. In 1975 Granite Construction Company won a contract to build the forebay and the following year placed the earthfill for the dam and Zone 1 lining for the reservoir. Also completed was work on penstock No. 2, the relocation of Highway 82 and the cofferdam, and the excavation of the tailrace channel. To prevent seepage, Reclamation awarded a contract to cover the bedrock of Mt. Elbert Forebay Reservoir with membrane lining.[47] At a winning bid of over $12 million dollars, the Kasler Corporation and L. H. Woods & Sons, Inc., began work on the conduit and diversion structures and essentially completed the 90-inches-diameter conduit, Leadville Fish Hatchery conduit, and Halfmoon Diversion in 1978. In 1981, with all the features completed, Reclamation turned over the forebay and dam, conduit, and powerplant to O&M.[48]

From the Twin Lakes, the diverted water would make its way downstream into the agricultural regions of the Arkansas River Valley where it would come to rest in the terminal storage reservoir located six miles west of Pueblo, Colorado, in the High Plains Province of the Colorado Piedmont. Dravo Corporation of California won the contract for the initial construction of Pueblo Dam–excavation, preparatory work on the foundation, and construction of the river gorge concrete plug–while the Green-Massman Corporation of Des Moines, Iowa, and Massman Construction Company, Kansas City, Missouri, won the contract to build the actual dam–the Fry-Ark's largest and most costly feature.[49]

Preliminary preparations began long before the contractors placed the first concrete in

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47. "Project History, Fryingpan-Arkansas Project," Vol. 13, 1975, p. 16; "Project History, Fryingpan-Arkansas Project," Vol. 14, 1976, pp. 14, 16; "Project History, Fryingpan-Arkansas Project," Vol. 18, 1980, p. 7, RG 115, NARA.
48. "Project History, Fryingpan-Arkansas Project," Vol. 14, 1976, p. 17; "Project History, Fryingpan-Arkansas Project," Vol. 16, 1978, p. 5; "Project History, Fryingpan-Arkansas Project," Vol. 19, 1981, p. 8, RG 115, NARA.
49. Kollgaard and Chadwick, eds., 551-2; "Project History, Fryingpan-Arkansas Project," Vol. 9, 1971, p. 9; "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, p. 20, RG 115, NARA.

1970. Crews constructed a bridge across the river to facilitate the movement of men and material to the damsite. They also made extensive surveys and, since the foundation was mostly Dakota sandstone and revealed three fault lines, took care to thoroughly prepare the foundation for the massive structure designed to sit on it. After temporarily rerouting the river, they filled in the gorge with concrete.[50] One of the more technically difficult jobs was the relocation of existing roads and rail lines. Relocation was common in water projects of this sort. On the Fry-Ark these projects included a county road in Pitkin County, Highway 82 and several historic buildings near Twin Lakes, power lines at the Sugar Loaf Dam and Turquoise Lake, and, in the case of the Pueblo features, a stretch of Highway 96 and of the Denver & Rio Grande Railway line and a few other appurtenant structures.[51]

The initial phase of the construction involved rerouting the river, plugging the river gorge with concrete, constructing the Bessemer Ditch outlet works, and preparing the foundation for the earthfill and dam. Once these tasks were completed, work under the second contract could begin. Crews delayed placing concrete until April 1973 due to severe weather conditions, but by year's end the dam had risen "to a point that filling the 30,000 acre-feet of permanent pool in Pueblo Reservoir could begin." In early 1974, water was released from Twin Lakes and Turquoise Lake for this purpose. Concrete placement continued in the stilling basin, buttresses, abutments, Bessemer Ditch outlet works, and South Shore Marina boat ramp.[52]

The center section of the dam has the distinction of being the first massive-head buttress dam built by Reclamation. The buttress design was more economical because it did not require

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50. "Project History, Fryingpan-Arkansas Project," Vol. 2, 1964, p. 14, RG 115, NARA; Kollgaard and Chadwick, eds., 666-7.
51. "Project History, Fryingpan-Arkansas Project," Vol. 3, 1965, p. 6; "Project History, Fryingpan-Arkansas Project," Vol. 7, 1969, p. 5; "Project History, Fryingpan-Arkansas Project," Vol. 8, 1970, pp. 2, 10, RG 115, NARA.
52. "Project History, Fryingpan-Arkansas Project," Vol. 8, 1970, p. 5; "Project History, Fryingpan-Arkansas Project," Vol. 9, 1971, p. 7; "Project History, Fryingpan-Arkansas Project," Vol. 11, 1973, p. 9; "Project History, Fryingpan-Arkansas Project," Vol. 12, 1974, p. 9, RG 115, NARA; Kollgaard and Chadwick, eds., 668-9.

as much concrete or excavation as other dam designs, and each buttress functions independently, which minimizes "the effects of unequal foundation deformations along the overall concrete section." The down side to this is that over time the buttresses have slightly shifted and compromised the integrity of the dam itself. At its completion, the concrete section of the dam stood 245 feet high and consisted of twenty-three head buttresses, an overflow spillway section, and several outlets. Together with the massive earthfill structure, the buttress features–among the biggest in the world–create an imposing presence against the sandstone and arid environment of the High Plains Province.[53]

The year 1975 marked the completion of the dam and the official opening of Pueblo Reservoir recreation area. Another contract to construct a stability berm on the downstream toe of the left abutment was completed five years later. With the terminal storage feature of Fry-Ark completed, water could be channeled to the hundreds of miles of farmland within the Arkansas River Valley and to cities such as Colorado Springs via the Fountain Valley and Arkansas Valley conduits. The dam also put an end to perennial flooding. This was a problem contractors experienced firsthand when on July 30, 1973, heavy rains caused the river to rise rapidly and flow at the rate of 8,000 cubic-feet per second, the water level reaching "a depth of 7 feet over the concrete plug."[54]

Construction on all the major Fry-Ark features–Ruedi Dam and Reservoir, the North and South Side Collection Systems, Sugar Loaf Dam and Turquoise Lake, Mt. Elbert powerplant, Pueblo Dam and Reservoir–underwent some modification as a result of the flourishing environmental movement. The National Environmental Policy Act of 1969, which mandated

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53. Kollgaard and Chadwick, eds., 666-9.
54. Kollgaard and Chadwick, eds., 667-9; "Project History, Fryingpan-Arkansas Project," Vol. 11, 1973, p. 37, RG 115, NARA.

environmental impact statements (EISs), was especially significant. Reclamation projects yet to be completed, like the Fry-Ark, had to undergo an intensive study of their environmental impacts. The Department of the Interior and the Bureau of Reclamation complied with this requirement, preparing EISs first on several individual features of Fry-Ark, then on the project as a whole. In 1972 the first EIS on Fry-Ark was released and submitted to the LM Regional Office for review.[55]

As in any EIS, the public was invited to comment on the EIS on the Twin Lakes features, and public comments expressed a variety of concerns ranging from environmental degradation caused by the project to fish and wildlife (including two endangered species, the American peregrine falcon and southern bald eagle).[56] People and organizations also expressed concern about the impact of the project on the historic features in the Twin Lakes area. The enlargement of Twin Lakes would not only inundate a few mining claims and disrupt some grazing activity, it also threatened several historic structures in the Interlake and Twin Lakes Historic Districts such as Inter Lachen Hotel and James Dexter's cabin. The Colorado State Historical Society claimed that relocating the historic buildings would lose "a great deal." Reclamation did what it could "to avoid conflicts with Twin Lakes Village" but eventually decided to relocate the buildings threatened by rising lake waters and awarded the contract for the work in 1980.[57]

Some found it odd that Reclamation would prepare an EIS on Twin Lakes without first preparing one on the project as a whole. Reclamation said that because the requirements for an EIS were not imposed by Congress until after construction began, the decision was made to draft impact statements "where construction was imminent." Not until 1974 did Reclamation draft an

55. "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, p. 3, RG 115, NARA.
56. Environmental Impact Statement, Fryingpan-Arkansas Project, 1975, 32-8, 40-1, RG 115, NARA.
57. Environmental Impact Statement, Fryingpan-Arkansas Project, 1975, 22, 26, 58, 69-70, 91, 103; "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, p. 27; "Project History, Fryingpan-Arkansas Project," Vol. 18, 1980, RG 115, NARA.

EIS for the overall project. At two public hearings, Federal and state agencies and private individuals and groups weighed in on issues such as the impact on surrounding areas, salinity, out-of-date operating principles, fish and wildlife, recreation facilities, and access to roads.[58]

The environmental impact statements had a profound impact on the shape of the Fry-Ark. Engineering studies found "multi-faceted environmental problems" associated with the construction of the Malta Diversion Dam and Canal, and as a result these features were dropped from the project. Reclamation originally planned to build an open canal to channel water from Sugar Loaf to the Mt. Elbert Forebay and Powerplant but opted instead for a closed conduit.[59] Crews accessed the Hunter Tunnel "via the tunnel proper rather than on access roads which would have had to be built across primitive forest land." At Twin Lakes construction only impacted the north side, leaving the more heavily timbered south end untouched. At the dedication of Mt. Elbert powerplant, commissioner Robert N. Broadbent praised the environmental precautions taken: "Our efforts to bring Fry-Ark and Mr. Elbert online have been accomplished with minimal impact on the environment. You can't see most of these efforts–and that's the way it should be. You can't see the 27 miles of tunnels which make up the collection system, the 13 stories of the powerplant that are buried below ground or the buried penstock leading from the forebay to the generators."[60]

Not all modifications, additions, or deletions from the original plan were due to environmental concerns. Some features were simply infeasible or unnecessary, like the Otero Canal and Powerplant, Clear Creek Dam and Reservoir, and Arkansas River Protective Works. Pueblo Dam was one of seven recently constructed earthfill dams earmarked for operative

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58. EIS, Fryingpan-Arkansas Project, 1975, 60, 62, 103, 109, 235, 426-8.
59. "Project History, Fryingpan-Arkansas Project," Vol. 10, 1972, 15; Vol. 11, 1973, p. 9, RG 115, NARA.
60. "Project History, Fryingpan-Arkansas Project," Vol. 18, 1980, p. 3, 9; "Project History, Fryingpan-Arkansas Project," Vol. 19, 1981, p. 13, RG 115, NARA.

changes following the Teton Dam disaster in June 1976. Modifications to the strength and stability of the dam were made in 1980 and 1981, and again in 1999 and 2000 when Reclamation installed new instrumentation and filled the plunge pool with concrete to prevent the buttresses from sliding. Other major changes in recent years have given the project a new look. For instance, Reclamation twice relocated sections of the Fountain Valley Conduit. Some of these changes were brought about due to a major study sponsored by Reclamation in cooperation with the water conservancy district in September 1990.[61]

Management and Uses of Project Water

The Southeastern Colorado Water Conservancy District, established in 1958, assumed the responsibility to repay some of the reimbursable costs of the project, exclusive of costs of Ruedi Dam and Reservoir. At a formal ceremony on January 13, 1965, Colorado congressmen and Secretary of the Interior Stewart L. Udall met to sign the contract under which the water conservancy district would repay $60 of $170 million construction costs. The water conservancy district also assumed the job of distributing the water to users in the Eastern Slope. The district's boundaries extended along the Arkansas River from Buena Vista on the West to Lamar on the East, as well as irrigable lands along Fountain Creek as far north as Colorado Springs.

While the water conservancy district is charged with repayments, Reclamation continues to manage the project features. In recent years it has implemented a security program to protect the major features from security risks. Its activities include security risk assessments on critical structures and the use of armed guards for security purposes. Reclamation hires private security in the Mt. Elbert area but elsewhere relies on local sheriff offices to provide off-duty officers to

61. Richard Lyman Wiltshire, "One Hundred Years of Embankment Dam Design and Construction in the U.S. Bureau of Reclamation," *Bureau of Reclamation History Symposium Papers* (Denver: Bureau of Reclamation, 2003), CD publication; Price interview; U.S. Department of the Interior, Bureau of Reclamation in cooperation with Southeastern Colorado Water Conservancy District, *Review of Operations, Fryingpan-Arkansas Project, Colorado*, September 1990, 1.

patrol critical features.

The U.S. Forest Service, the caretaker of much of the land surrounding the project in the mountainous areas, also has a role in ownership and management. The Forest Service welcomed the project, believing that service roads for the Ruedi features in the White River National Forest would actually improve forest and timber management, and only minimally impact wildlife and livestock populations. The Forest Service oversees boating, fishing, camping, picnicking and other recreation activities on Fry-Ark features, except at Pueblo where the fish hatchery and recreation are managed by Colorado State Parks.[62] In recent years white-water rafting has become popular on the Arkansas River, and in the 1990s Reclamation has modified the water flow of the river to accommodate the demand for river rafting. Unfortunately, while higher flows in the late summer pleased river runners, it disrupted the spawning patterns of brown trout and angered trout fisherman.[63]

As for uses of water from Ruedi Reservoir on the Western Slope, back when Fry-Ark was being debated in Congress there had been hope of making the development of oil shale profitable. For several years beginning in 1973 oil prices climbed upward, and it seemed that it might be profitable to revive the oil shale business. Oil companies even began to set up operations on the Colorado Plateau but they stayed only a short time. In 1982, the largest potential developer, Exxon, abandoned its project and took with it the hope of the oil industry. Development of this sort was a mirage–it required too much water and energy and far too little profit. The West Slope continues to languish economically, its primary revenue base tourism.[64]

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62. "Project History, Fryingpan-Arkansas Project," Vol. 1, 1963, pp. 90-1, RG 115, NARA; Draft Summary of Status Report, Fryingpan Arkansas Project (Denver, Colorado: Bureau of Reclamation, February 1972), 31; Price interview.
63. Pearson, 32.
64. Duane Vandenbusche, 42-3; Sprague, 186-90. In 1980, the Colony Development Operation signed a contract for 6,000 acre-feet of water from Ruedi reservior for the purpose of developing oil shale. "Project History,

(continued...)

The story is different on the Eastern Slope, where water is put to beneficial use in both rural and urban areas. Farmers use a sizable portion of project water but the vast majority of it goes to urban and metropolitan areas, and proportion of irrigation to M&I water continues to increase as water is put to M&I use. In 1960 it was estimated that 280,600 acres of agricultural land would benefit from the project for a yield of $2 million annually. That was then; now approximately 60,000 acres of irrigated crop land has been dried up for M&I use. Three-fourths of that water went to Colorado Springs Utilities, Pueblo Board of Water, Pueblo West & Aurora. Aurora also purchased the majority of the Rocky Ford Ditch–8,000 acres. Currently, 23,000 acres have been sold under the Fort Lyon Canal and this water will eventually be changed to M&I uses. With the development and growth of the Front Range come water-related challenges, and it is never certain how best to allocate and from where to tap into new water resources. The matter of water supply is made the concern of elected officials and interested parties, and from time to time these groups come together to discuss the transfer of water within the state of Colorado.[65]

The demand for project water depends on the rate of runoff during the spring months. In the mid-1980s water levels were above average, and demand for irrigation or municipal water was much lower than it had been before. The project did not even divert all its entitled water because storage capacity had capped. But in most years there is demand for supplemental water. To supplement project water, water users store native river flows during four winter months of the year. Farmers are entitled to a share of Arkansas River water during the winter months, but the only purpose of making deliveries during those months is to maintain the water table and

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64. (...continued)
Fryingpan-Arkansas Project," Vol. 19, 1981, p. 6, RG 115, NARA.
65. Tom Musgrove, private correspondence with the author, July 26, 2006.

show the water has been put to beneficial use during the period. Water put to use in the winter does little to increase crop production. Putting the water in storage gives irrigation an additional supply during the growing season. The benefit of the Winter Water Storage Program to the Fry-Ark is tremendous: yielding in excess of 100,000 acre-feet of winter water compared to an average of 30,000 acre-feet of project water. For the program to work the canal companies had to agree to the storage and distribution, and they then filed for a decree in District Water Court, which they obtained in 1987.[66]

Conclusion

The story of the Fryingpan-Arkansas Project illustrates aptly the value and importance of water in the Colorado and the West. Always in short supply, water is guarded cautiously and jealously by individuals and organizations from intrastate and interstate interests. Frank Evan's comments at the dedication of the Mt. Elbert Powerplant reflect the defensive feelings many people have in Colorado over water: "It has taken almost 50 years from idea to completion to get this project done. We can't wait 50 years for the next one. Arizona and California are using water that belongs to Colorado. We have to do our job in 10-15 years or we'll lose our water."[67] While the Fry-Ark may have temporarily put to rest some of the fears of Coloradoans on the Eastern Slope, the disputes over water surface repeatedly. The questions of who gets what and how much are far from solved, compounded by the relentless urban growth along the Front Range.

Aside from the problems of water supply, few would dispute that for what the Fry-Ark does, it does it well. Its features are generally in good repair and efficient in collecting, transferring, storing, and distributing water. It has provided employment and services to varied

66. Milenski, 141-3; Musgrove, correspondence.
67. "Project History, Fryingpan-Arkansas Project," Vol. 19, 1981, p. 14, RG 115, NARA.

interests on both sides of the Continental Divide. The Fry-Ark will continue to play a vital role in providing water which is much in demand as Colorado continues to grow.

About the Author

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