Scofield Project

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The Scofield Project

The Scofield Project arose out of the remnants of various private dams, which either failed, or never lived up to expectations. The new Scofield Dam and Reservoir replaced the rapidly deteriorating, old Scofield Dam, built by the Price River Water Conservation District. The Scofield Project eventually irrigated area lands originally to be served by Mammoth Dam, and later by the defunct Gooseberry Project. Mammoth Dam failed in 1917, before its completion. While the Scofield Project evolved out of the Gooseberry Project, the need to protect vital rail lines from flood damage during the Second World War was a key to construction of Scofield. Where World War II suspended construction on most Reclamation projects, the fear that the existing Scofield Dam might fail and cause millions of dollars of damage and disrupt transportation, influenced the Federal government to go ahead with the Scofield Project.

Project Location

Scofield Dam and Reservoir lie on the Price River in Carbon County, Utah. The Project supplies irrigation water to farms near the towns of Helper, Wellington, and Price, and extends into Emery County. Both counties are in central Utah, lying within the Great Basin Desert and have an arid landscape which need of water to support farming. Reclamation officials considered the Price area, also known as Castle Valley, a good example of geologic erosion. More than one-half of the valley consists of uplands and steep buttes. Alluvial fans, covered by juniper and piñon pine trees, slope down from the buttes. The nearest metropolitan area is Provo/Orem, located in Utah County, about fifty miles northwest of Scofield Reservoir.[1]

Historic Setting

The Scofield Project is located in the principal coal producing region of Utah. The Pleasant Valley Coal Company organized in the area in 1876. By 1900, its mines turned out 75 percent of the coal in the state. Early miners hauled coal with teams and wagons, over the

1. Water and Power Resources Service, *Project Data* (Denver: Government Printing Office, 1981), 1140; Bureau of Reclamation, *Annual Project History, The Scofield Project, 1945*, Record Group 115, 13. Hereafter Record Group 115 cited as RG 115.

Wasatch Mountains, to Provo and Springville. The journey took four days and could not be accomplished during the winter. In 1875, the Utah and Pleasant Valley Railroad organized and constructed a narrow gauge line from Springville to the coal mines near the town of Scofield. Eventually, the Denver and Rio Grande Western Railway Company acquired the Utah and Pleasant Valley. In 1882, the D&RGW built a narrow gauge line from Tucker, traveling over Soldier Summit, to Colton. The railroad constructed another branch line from Colton, paralleling the Price River, that connected to the old line at a point now under Scofield Reservoir. The D&RGW completed a narrow gauge line in 1883, extending from Colton to the Colorado border, completing a Denver to Ogden, Utah rail line.[2]

Farmers first started irrigating Castle Valley in the early 1880s. The residents organized ditch companies and diverted water from the Price River onto the surrounding arid lands. The Mammoth Reservoir Company was organized in 1896, and immediately filed for rights to the flood waters of the Price River. A group of local farmers obtained Mammoth's rights to store water and transport it through the mountains to their properties in Sanpete County. Financial difficulties in 1902, forced the group to sell their rights to the Irrigated Lands Company. The company abandoned the attempt to water Sanpete County lands, and turned its attention to irrigating 25,000 acres near Price. Irrigated Lands started building Mammoth Dam in 1908. Also beset by financial difficulties, Irrigated Lands Co. reorganized in 1911, as the Price River Irrigation Company. Price River Irrigation continued the project as long as finances and the demand for water allowed.[3]

Only partially completed, Mammoth Dam collapsed on June 25, 1917, releasing 11,000 acre-feet of water. The flood caused an estimated one million dollars in damage to railroad and mine property. After the collapse, Price River Irrigation abandoned construction of the dam. The Price River Water Conservation District (PRWCD) formed in 1921, to develop storage

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2. Bureau of Reclamation, *Annual Project History, The Scofield Project, 1944*, RG 115, 12-3; Reclamation, *Project History, Scofield Project, 1945*, 13.
3. Water and Power Resources, *Project Data*, 1139; Bureau of Reclamation, *Annual Project History, The Scofield Project, 1943*, RG 115, 11; A. O. Babb and T. W. Mermel, *Catalog of Dam Disasters, Failures, and Accidents*, Department of the Interior, Bureau of Reclamation, Washington D.C., 1968, 143.

facilities in the Price River watershed for district lands. The PRWCD prepared plans to build the original Scofield Dam and sold bonds to fund construction. The PRWCD built Scofield Dam in 1925-26, in time for the 1926 irrigation season. The district tried to consolidate the various ditch companies into one legal entity, but failed in its effort. At first, the PRWCD contracted with the ditch companies for delivery of water using the companies' canals. Later most water users had to reach individual agreements with the canal companies.[4]

Within a few years, Scofield Dam began deteriorating. The outlet tunnel lining repeatedly failed, and the embankment suffered some erosion damage in 1928. On May 21, 1928, a tunneling beaver caused a leak which nearly caused the dam to fail, and threatened towns in the valley, but the work of valley residents, farmers, and miners averted disaster. The PRWCD made some repairs on the embankment and the outlet tunnel, lowering the embankment seven feet. The state of Utah ordered the spillway lowered an additional seven and one-half feet, reducing storage capacity. The outlet tunnel continued to deteriorate, adding further expenses for the district. The PRWCD again lowered the spillway in 1942, reducing storage capacity to 30,000 acre-feet, the maximum mandated by the State Engineer, but less than half the original capacity of the dam. The emergency repairs spared the dam, but the fear lingered that a large, sudden runoff into the reservoir could destroy the dam embankment.[5]

Project Authorization

The possible failure of the old Scofield Dam threatened to send 30,000 acre-feet of storage downstream. Not only could a large amount of valuable irrigation water be washed uselessly downstream, but the resulting flood would endanger hundreds of lives, threaten the tracks of the Denver and Rio Grande Western Railroad (which paralleled the Price River for some distance), Utah Highway 96, telephone and telegraph lines, and flood nearby coal mines, primarily the Castlegate and Royal Mines. Potential damage was estimated at five million

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4. Reclamation, *Project History, Scofield Project, 1943*, 11; Water and Power Resources, *Project Data*, 1139.
5. Reclamation, *Project History, Scofield Project, 1943*, 11, 13; John J. Dempsey, Under Secretary of the Interior, to Senator Orrice Abram (Abe) Murdock of Utah, 1 April 1942, *Bureau of Reclamation Project Correspondence File 1930-45*, box 1023, file 301: Engineering Reports and Estimates thru April 1943, 1; Bureau of Reclamation, *Annual Project History, The Scofield Project, 1981-82*, RG 115, 4.

dollars. Officials estimated the financial losses from damage to transportation, lines of communication, and the coal mines at an additional $12.5 million dollars. Because the Denver and Rio Grande Western hauled a significant amount of coal and coke for steel production to the Defense Plant Corporation, the flood threat to the railroad's line took on considerable importance. In addition the D&RGW line transported steel to plants in Ironton, Geneva, and the Kaiser steel mill in Fontana, California, and carried a large number of passengers and troops.[6]

Secretary of the Interior Harold L. Ickes notified Secretary of War Henry Stimson that Reclamation Commissioner John C. Page considered the threat to downstream railroads, agriculture, and mines pertinent to the war effort. PRWCD was willing to transfer its interest in the existing Scofield Dam and Reservoir to a new dam, and subordinate its water rights to those of the planned Gooseberry Project. However, the district would not transfer its water rights to Reclamation, contending reconstruction of Scofield Dam was to take care of what the United States government and the Carbon Water Conservancy District (CWCD) deemed a flood hazard. The PRWCD felt the new Scofield Dam would primarily protect CWCD lands, not PRWCD acreage.[7]

Reclamation planned the Gooseberry Project in the 1930s, as part of the proposed Salt Lake Basin Project, to irrigate lands in Carbon County. Under the Gooseberry Project plans, Reclamation would replace Scofield Dam, and build a new Mammoth Dam nine miles upstream from Scofield Reservoir, on Gooseberry Creek. Mammoth Tunnel would carry water to lands in the vicinity of Fairview, Mt. Pleasant, and Moroni for a supplementary irrigation supply in Sanpete County. Authorization of the Scofield Project did not immediately end plans for the

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6. Reclamation, *Project History, Scofield Project, 1943*, 7, 10; Bureau of Reclamation, *Annual Project History, The Scofield Project, 1944*, RG 115, 14; Bureau of Reclamation, "Report on Scofield Project, Utah, September 1942," *Bureau of Reclamation Project Correspondence File 1930-45*, box 1023, file 301: Engineering Reports and Estimates thru April 1943, front map; Reid Jerman to Hydraulic Engineer, Denver, Colorado, 26 January 1943, *Bureau of Reclamation Project Correspondence File 1930-45*, box 1023, file 301: Engineering Reports and Estimates thru April 1943, 2; R. K. Bradford of the Denver and Rio Grande Western Railroad to Bureau of Reclamation, Attn: R. Jerman, 20 January 1943, attached to letter from Reid Jerman to Hydraulic Engineer, Denver, Colorado, 26 January 1943, *Bureau of Reclamation Project Correspondence File 1930-45*, box 1023, file 301: Engineering Reports and Estimates thru April 1943.

7. Harold Ickes, Secretary of the Interior, to Henry Stimson, Secretary of War, 14 April 1943, Bureau of Reclamation, *Bureau of Reclamation Project Correspondence File 1930-45*, box 1023, file 301: Engineering Reports and Estimates thru April 1943.

Gooseberry Project. After World War II, Reclamation investigated Gooseberry as an independent project. In the early 1950s, Region Four Director Ernest O. Larsen recommended the Gooseberry Project become part of the Colorado River Storage Project, but estimated costs caused the project to disappear after 1959.[8]

Concern over the old Scofield Dam arose during the winter of 1941-42. The wet winter weather contributed to a heavy snowpack in the neighboring mountains, leading to a fear that Scofield Dam might not handle the subsequent runoff. The PRWCD lowered Scofield's spillway an additional ten feet during February and March of 1942. In 1943, Reclamation recommended construction of Scofield Dam as a separate project, under the authority of the Interior Department Appropriation Act of 1940. In an April 1942, letter to Senator Orrice Abram (Abe) Murdock of Utah, Under Secretary of the Interior John J. Dempsey listed several reasons for using the 1940 Appropriation Act rather than the Water Conservation and Utilization Act of August 11, 1939 (53 Stat 1418).[9]

The 1939 act required title to the dam, reservoir, and irrigation and other project works to remain in Reclamation's hands until Congress approved other ownership. The Federal government believed the existing ownership situation was so complicated and involved that it would take a year or more to contact all parties and acquire title. The war prevented Reclamation from recommending the entire proposed Gooseberry Project, by limiting the funds available for construction. Dempsey considered it doubtful that Reclamation could even get the men and materials required for construction of the Gooseberry Project. Even though Reclamation sought to authorize Scofield under the 1940 Interior Appropriation Act, President Franklin D. Roosevelt authorized the project on June 24, 1943, under the provisions of the Water

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8. John J. Dempsey to Senator Abe Murdock, 1 April 1942, 1; Department of the Interior, Bureau of Reclamation, "Salt Lake Basin Project, Gooseberry Dam: Preliminary Estimates," *Project Reports*, RG 115, Denver, February 1933, box 423, 1; Department of the Interior, Bureau of Reclamation, "Report on Price River Basin Investigations--Utah," *Project Reports*, RG 115, September 1940, box 423, 51; Department of the Interior, Bureau of Reclamation, "Gooseberry Project Utah: Recommended as a Participating Project in the Colorado River Storage Project," *Project Reports*, RG 115, Region 4, Salt Lake City, January 1953, box 423, 1; Bureau of Reclamation, *Annual Project History, The Sanpete Project, 1983*, RG 115, 3.
9. *Ibid*., 2.

Conservation and Utilization Act of 1939.[10]

Construction History

Under Construction Engineer Parley R. Neeley, Reclamation awarded the contract for Scofield Dam to W. W. Clyde and Company of Springville, Utah, for $503,903 on September 10, 1943. Because the statutory requirements regarding rights of way slowed the process of acquisition as Reclamation officials predicted, Reclamation gave formal notice to proceed only on November 23, 1943. W. W. Clyde did not sit still, starting work immediately after signing the contract. The company started moving equipment to the site September 13, and began building a warehouse and shops.[11]

The company began work on the railroad and highway relocation on September 22, 1943, completing 1,400 feet of excavation. W. W. Clyde used the excavated material as fill for Highway 96. Starting on October 2, workers stripped the dam site for the embankment, and washed the excavated material downstream. Clyde took suitable material from the cutoff trench, and stockpiled it for use in the embankment. The contractor began excavating the outlet works on October 4, completing it sufficiently to commence setting forms for concrete October 26.[12]

W. W. Clyde started concrete work on the outlet conduit November 9, 1943. Bad weather forced the contractor to shut down operations on November 20, 1943, but before work stopped, crews placed sixty-three feet of concrete in the outlet conduit. As Dempsey anticipated the war effort made laborers hard to come by, creating difficulties for Clyde in getting semi-skilled and unclassified workers.[13]

While, the contractor resumed operations at Scofield Dam on April 4, 1944, rainstorms delayed construction during April and May. Pre-construction work during April consisted of building a bridge across the old spillway channel, and another over the Price River, below the dam site. At the start of construction, W. W. Clyde built and equipped a shop about 2,000 feet

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10. John J. Dempsey to Senator Abe Murdock, 1 April 1942, 2; Water and Power Resources, *Project Data*, 1140.
11. Reclamation, *Project History, Scofield Project, 1943*, 10, 16.
12. *Ibid*., 16.
13. *Ibid*.

upstream from the old dam. The contractor rented a fishing camp approximately one mile upstream to provide housing and a mess hall for its workers. The company built additional sleeping facilities to accommodate up to eighty men. Clyde secured an agreement with Utah Power and Light Company (UP&L) to furnish power for pumping, lights, and other construction operations. Utah Power and Light crews completed the line and started operation in June 1944.[14]

W. W. Clyde set up a stockyard for storing concrete aggregate and reinforcing steel, with a shed for housing cement, along the relocated Highway 96. Final railroad relocation began in 1944. At that time, Reclamation forces cleared the right of way to relocate the telephone line next to the railroad tracks. A Western Union crew constructed the new telephone line, costing Reclamation about $1,350.[15]

W. W. Clyde started excavating the outlet works on May 1, 1944. Open trenches along the outside of the concrete line controlled groundwater seepage along the excavation. The foundation of the left wing wall consisted of a fine river sand and muck judged unsuitable because of considerable water content. This resulted in a design change to a rockfilled crib wall on a concrete filled trench.[16]

At the end of spring of 1944, W. W. Clyde used tractors and carryalls to excavate the spillway down to rock. The contractor drilled and shot the rock, excavating the material with a power shovel. The subgrade for the spillway stilling basin was practically all shale, which disintegrated rapidly when exposed to air or covered by water. To keep the subgrade from deteriorating during preparations for concrete placement, the contractor cleaned the shale with shovels, brooms, and an air jet, then immediately covered it with a three-inch layer of concrete. Clyde cured the concrete by covering it with water while placing the forms and reinforcement steel.[17]

The contractor began preparations for diverting the river after completion of the outlet works in July 1944. Reclamation decided to make portions of the cofferdam permanent parts of

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14. Reclamation *Project History, Scofield Project, 1944*, 18.
15. *Ibid*.
16. *Ibid*., 19, 22.
17. *Ibid*.

the dam. The balance of the dike would be outside of the dam section. W. W. Clyde stripped the area for the permanent portion of the dam to a suitable subgrade and backfilled it with the stockpiled embankment material. Around the trashrack and outlet tube, mechanical air tampers packed the material. Those areas required considerable material, but could not be rolled by a large roller because of limited section involved. W. W. Clyde received permission from Reclamation to use their own sheep's foot roller, pulled by a tractor to compact the area, eliminating the need to use hand labor.[18]

W. W. Clyde finished much of the dry excavation for the cutoff trench in the fall of 1943. In 1944, the contractor finished some excavation using a dragline to dig beneath the river's surface. After completion of the permanent cofferdam, channel to the outlet works, and a dike on each side of the river, the company closed off the water on July 18, 1944. Clyde closed the gates of old Scofield Dam to shut off the river upstream from the new dam, and closed the coffer to divert water through the outlet works. After diversion of the river, the contractor started pumping water from the cutoff trench. Clyde de-watered the trench using two four-inch centrifugal pumps with electric motors and two eight-inch gas-driven vacuum pumps. The electric pumps operated from floats in dug a sump, and the contractor held the other pumps in reserve in case of breakdown.. Excavation of the cutoff trench continued as rapidly as possible to its completion. The company turned the water back into the river after three days.[19]

The contractor excavated the trench in lifts of about ten feet. Trucks hauled the excavated material to stock or waste piles. As work progressed, it became necessary to lengthen the ramp leading out of the trench after completion of each lift. When the ramp became too steep for the equipment to get out under their own power, workers attached a tow line to the power take off of a tractor, which helped pull the trucks out of the trench. Clyde used a system of tile drains to de-water the dam foundation, keeping the water ten feet below the embankment placement at all times.[20]

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18. *Ibid*., 9, 23.
19. *Ibid*.
20. *Ibid*., 26.

The contractor used material excavated from the railroad cut, and a stockpile of material from the spillway excavation as embankment material. Work crews loaded the material into dumpsters, and hauled them to the top of a chute set over a grizzly, a screen used to separate soil and gravel. They dumped the material into the chute as needed to fill the bin under the grizzly. Workers then dumped and spread the material. The contractor used tampers along the cutoff wall and against the abutments, where a roller could not be used. Clyde placed 761 cubic yards on the rockfill portion of the embankment in 1944.[21]

The United States Employment Offices at Provo and Price were unable to refer enough men for the contractor because of the demand for workers in the coal mines, the Geneva Steel Plant in Orem, and Army and Navy installations in the area. The maximum number of men employed on the Project in any one month was ninety-one, and in the work year from May 1 to November 10, the Project averaged sixty men a month. A large labor turnover and frequent absenteeism added to the labor shortage. On December 27, 1944, Clyde requested an extension of 299 days, based on the shortage of labor. Reclamation granted the request, setting November 22, 1945, as the new completion date.[22]

W. W. Clyde resumed work on April 23, 1945. Until May 1, Clyde limited operations to moving in equipment, enlarging the camp, general cleanup, and repairs of plant installations, in preparation for actual construction. Camp enlargement included construction of a bath house. On May 1, the contractor began pumping water from the cutoff trench. The grizzly which separated material from the excavation was remodeled to give cleaner separation.[23]

During 1945, the contractor completed the railroad cut, fine graded it, placed the ballast, and shifted the track to its final location. Clyde ceased using the company's track spur after final relocation of the railroad. A shovel excavated the cut, and loaded the material on dumpsters, which, along with tractors and carryall scrapers, hauled it to the grizzly. As excavation progressed, Clyde encountered more rock that required some drilling and shooting in order to

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21. *Ibid*. 31.
22. Reclamation, *Project History, Scofield Project, 1944*, 18; Reclamation, *Project History, Scofield Project, 1945*, 23.
23. Reclamation, *Project History, Scofield Project, 1945*, 23, 25.

excavate. In some areas the rock proved solid and stable enough to stand on a slope steeper than 1:1. Clyde staked a slope of ½:1 and excavated it to that line. This saved some excavation because the material was not suited for fill on the compacted embankment of the dam. Most of the excavated rock was shale, making it unsuitable for use in the rockfill section of the dam.[24]

Work resumed on the embankment May 16, 1945, and continued until October 3, 1945. The work included fill for the highway at the north end of the dam and the backfill against the left spillway wall. The contractor completed backfilling the right spillway wall on October 10, 1945. Material for the compacted fill came from the excavation of the spillway, highway, outlet works, railroad cut, cutoff trench, and from the borrow pit. The contractor took most of the material from the railroad cut, highway, and borrow pit excavation to the grizzly, then transported it directly to the fill. Clyde stockpiled material from the other sources. During 1945, Clyde built Highway 96 across the old spillway and connected it with the dam. From the south end of the dam it met the old road.[25]

Trucks and dumpsters transported material to the fill, and bulldozers then spread it. Workers added necessary moisture by sprinkling or spraying the dumped piles with a water jet, then compacted the lift. A motor patrol grader, with scarifier teeth attached, scarified the top of the compacted lifts before placement of another lift. The grader served to further mix the material, distributing the moisture more thoroughly. A standard government roller compacted the fill. In the areas where a roller could not reach, work crews used an air hammer with a tamping foot, but it required a large amount of labor.[26]

When the fill reached the elevation of the outlet works, a need for increased mechanical compaction arose. Because of the shortage of labor, it proved necessary to hasten the mechanical compaction. Reclamation suggested to the contractor, that he use a heavy drop hammer, operated by a dragline, and Clyde used a 3,700 pound drop hammer. The contractor found a three foot drop, tamped once by the hammer, obtained the required density, with the

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24. *Ibid*., 23, 32.
25. *Ibid*., 32, 36.
26. *Ibid*., 36-7.

optimum moisture mixed in the material. To secure the necessary water-soil mixture, workers mixed the material on the main fill, then bulldozed or spread it into place by hand before compaction.[27]

In 1945, the contractor had to quarry an additional 2,500 cubic yards of rock to make up for a shortage in the necessary amount. The contractor placed the quarried rock on the face of the dam. Work crews also placed three foot layer of dumped riprap on the face of the dam.[28]

W. W. Clyde staked a channel for excavation through old Scofield Dam to breach the structure in preparation for water storage behind the new dam 800 feet downstream. The contractor excavated the channel with tractors and carryalls, only deep enough to still allow road traffic across the old dam. When traffic was allowed across the new dam, Clyde finished excavating the channel. The contractor used suitable rock from the old dam for riprap on the new dam.[29]

W. W. Clyde continued working in spite of a scarcity of labor on the project throughout the 1945 work season. The company had difficulties in obtaining labor, and experienced a large turnover and frequent absenteeism during the season. When fall arrived many laborers left the job, and there were no replacements to fill their positions. The shortage of unskilled labor and truck drivers proved most acute. While the War Manpower Commission set a labor ceiling of 162 men for the Scofield Project, the contractor never reached the ceiling. The maximum number of workers for any one week reached 101. The average number of men employed on the Project between May 1 and November 20, 1945, was seventy-three. In December 1945, W. W. Clyde requested a seventy-five day extension, Reclamation allowed another time extension of 236 days, fixing July 16, 1946, as the final completion date.[30]

Reclamation started water storage behind Scofield Dam in November 1945, and continued in the winter and spring of 1946. W. W. Clyde resumed construction operations on

27. *Ibid*., 37.
28. *Ibid*., 44, 46.
29. Reclamation, *Project History, Scofield Project, 1945*, 46; Bureau of Reclamation, *SEED (Safety Evaluation of Existing Dams) Report on Scofield Dam, Scofield Project, Utah, Upper Colorado Region*, April 1984, Examination Report, 2-3.
30. Reclamation, *Project History, Scofield Project, 1945*, 23; Bureau of Reclamation, *Annual Project History, The Scofield Project, 1946*, RG 115, 18.

April 29, 1946. For the first time since the start of construction in 1943, labor became abundant on the Scofield Project.[31]

For about one-quarter of a mile downstream, the contractor widened the river channel to a minimum of fifty-five feet. The company placed 1,396 cubic yards of riprap in the outlet channels. The left side of the spillway inlet received sixty square yards of grouted paving. W. W. Clyde built a log boom across the reservoir approximately 1,000 feet upstream from the dam, to stop floating debris from drifting to the trashrack. The boom contained logs ten to twenty feet in length, with a diameter of five to twelve inches. The logs were fastened to two cables extending across the reservoir. The contractor used logs salvaged from the crib wall at the top of the earth separation plant for the boom. W. W. Clyde completed Scofield Dam on June 15, 1946.[32]

In 1947, Burks and Company of Denver received the contract to clear part of Scofield Reservoir for $20,000. The company received the notice to proceed on June 18, 1947. The contractor started operations on July 9. Areas too wet for the use of heavy equipment and with brush too widely scattered were cleared by hand. A tractor with a cutter bar tackled the heavier brush, and a sickle and bar attachment removed small willows. A bulldozer piled the brush for burning. The contract allowed Burks and Co. 420 days for completion. The company finished clearing the reservoir on October 21, 1947, only 125 days after receiving the notice to proceed.[33]

Scofield Dam is a zoned earthfill structure standing 125 feet high. The dam's crest length is 575 feet with a top width of thirty feet. The maximum base width is 400 feet. The total volume of Scofield Dam is 204,000 cubic yards. Total capacity of Scofield Reservoir is 73,600 acre-feet with an active capacity of 65,800 acre-feet. The spillway is an uncontrolled concrete crest and concrete lined chute at the right abutment.[34]

Post Construction History

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31. Reclamation, *Project History, Scofield Project, 1946*, 12, 18; Water and Power Resources, *Project Data*, 1141.
32. Reclamation, *Project History, Scofield Project, 1946*, 12, 19.
33. Reclamation, *Annual Project History, The Scofield Project, 1947*, RG 115, 8.
34. Water and Power Resources, *Project Data*, 1141.

Because water did not percolate through the soil very well, Carbon County farmers frequently faced drainage problems even before construction of the new Scofield Dam. Large seeped areas developed. The drainage problems cost area farmers about 3,000 acres of what was originally developed. Because individual irrigation ditch companies continued operating, Reclamation had no responsibility for the drainage problems.[35]

Presentations and meetings in 1976, detailed pollution problems in Scofield Reservoir. Courtney Brewer, Director of the Carbon County Waste Water Quality Management Planning Office, predicted that if the projected population growth for the Scofield area materialized, Scofield Reservoir could be dead in ten years from pollution. Housing developments on the north and east sides of the reservoir often failed to comply with county zoning ordinances. People parked their "privies" and mobiles homes along the shoreline of Scofield Reservoir apparently with no consideration of possibly contaminating the nearby water. The Carbon County Commission briefly considered a building moratorium in the reservoir area in a meeting on May 4, 1976, but decided not to impose it.[36]

In 1977, a severe drought struck Utah. Price encouraged all reservoir shareholders to lease or lend their shares to the city for the year, so the surplus could be legally treated and distributed to its 1,800 hookups outside city limits. During the drought, gross crop values sank to about 50 percent of the years prior to and following the water shortage. The extent of the drought could be seen by comparing the amount of active water storage between 1977, and the previous years. In 1974, Scofield Reservoir stored 44,800 acre-feet of water. Over each of the next two years the amount stored dropped to 37,200 and 28,800 acre-feet respectively. In 1977, Scofield Reservoir stored a mere 1,777 acre-feet of water, a small fraction of the reservoir's capacity.[37]

A dam tender reported seepage adjacent to the right wall of the spillway stilling basin on May 5, 1980. The water created a pond behind the concrete wingwall of the stilling basin. The

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35. Reclamation, *Project History, Scofield Project, 1945*, 13.
36. Bureau of Reclamation, *Annual Project History, The Scofield Project, 1976-78*, RG 115, 5-5a, 6b.
37. Reclamation, *Project History, Scofield Project, 1976-78*, 6-7.

initial flow measured fifteen gallons per minute. Scofield Reservoir rose seven-tenths of a foot and the seepage flow increased to twenty gallons per second. By June 9, the reservoir dropped nine-tenths of a foot and the flow decreased to two and three-quarter gallons per minute. Reclamation placed fluorescent dye along the shoreline next to the right abutment near the spillway, but none appeared in the seepage flow. In 1980, a Safety Evaluation of Existing Dams (SEED) report stated the seepage had been noticed as early as 1958, but never measured.[38]

According to the SEED report, springs naturally occurred in the area. The dam tender's source of potable water was a natural spring downstream from the right abutment, above the reservoir, water surface. Other springs were located on cut slopes near the railroad tracks. The report gave three possible, but not definite explanations for the seepage:

1. Water came from the reservoir through the abutments;
2. The water came from the reservoir under the spillway;
3. The seep resulted from a high groundwater table in the abutment area.[39]

Another concern about Scofield Dam was the embankment, which does not have a filter zone between the embankment material and the riprap. The filter zone would have consisted of a pervious material to provide drainage to prevent saturation of the core, but prevent erosion of the core's soil. The SEED report stated, "Such a design would be unacceptable by today's [1984] standards."[40] Reclamation inspectors found the bridge over the spillway in poor condition, with the concrete deteriorating severely. In 1983, the spillway bridge was widened and improved.[41]

In sharp contrast to the drought in 1977, Utah experienced flood years in 1983 and 1984. In 1983, officials at Scofield Dam released water all winter in preparation for the spring runoff. Even with the precautions, Scofield Reservoir filled to its 65,800 acre-foot active capacity by June 22, and was spilling about 700-750 cubic feet per second. The reservoir filled on May 25, 1984, and spilled through July 21, of the same year.[42]

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38. Reclamation, *SEED Report on Scofield Dam*, Examination Report, 5.
39. *Ibid*., 5-6.
40. Reclamation, *SEED Report on Scofield Dam*, 5-6; Department of the Interior, Bureau of Reclamation, *Design of Small Dams: A Water Resources Technical Publication*, 3d ed. (Denver: Government Printing Office, 1987), 629.
41. Reclamation, *SEED Report*, Intermediate Examination Report, 5.
42. Bureau of Reclamation, *Annual Project History, The Scofield Project, 1983*, RG 115, 7; Bureau of Reclamation, *Annual Project History, The Scofield Project, 1984*, RG 115, 7.

Settlement

Unlike the stereotype of Utah being populated mostly by members of the Mormon Church, many of Carbon County's population were Italian and Greek immigrants. Italian immigrants started working in the mines of Carbon County in the 1890s. The Greeks arrived at the beginning of the twentieth century. At one point, the Greeks were the largest group of immigrants in Utah's mining towns.[43]

Carbon County is fairly small in terms of population, though the coal mining industry proved a boon to the area from the late nineteenth to the late twentieth century. In 1945, Price had 7,500 inhabitants, while Helper and Wellington had populations of 3,200 and 1,100, respectively. The population of Price failed to increase by 1947, and Wellington dropped to 450. Helper increased to 5,200 people and Spring Glen had 500. By 1990, the area had experienced a population roller coaster. In 1960, Price had a population of 6,802, which decreased to 6,218 in 1970. The city's population increased to 9,086 in 1980, dropping to 8,712 in 1990.[44]

Helper had a population of 2,459 in 1960, but dropped to 1,964 in 1970. In 1980, Helper's population reached 2,720, decreasing to 2,148 residents in 1990. Wellington had 1,066 residents in 1960, which fell to 922 in 1970. In 1990, Wellington had a population of 1,632. Spring Glen did not show up in the later censuses. Carbon County had 21,135 residents in 1960, but that number dropped to 15,647 in 1970. In 1980, the county's population reached 22,179, and dropped to 20,228 inhabitants in 1990.[45]

Construction of the Scofield Project did not have an impact on settlement in Carbon County. Because new Scofield Dam simply replaced the old, failing Scofield Dam, Project lands were already settled, and the status quo remained. In 1942, Reclamation's Assistant Chief

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43. Helen Z. Papanikolas, "The Exiled Greeks," in *The Peoples of Utah*, ed. Helen Z. Papanikolas (Salt Lake City: Utah State Historical Society, 1981), 409-10, 416.

44. Reclamation, *Project History, Scofield Project, 1945*, 14; Reclamation, *Project History, Scofield Project, 1947*, 21; Department of Commerce, Bureau of the Census, *Nineteenth Census of the United States, 1970: Characteristics of the Population, vol. 46: Utah*, (Washington: Government Printing Office, 1973); Department of Commerce, Bureau of the Census, *Twentieth Census of the United States, 1980: General Social and Economic Characteristics, vol. 46: Utah*, Washington: Government Printing Office, 1983; Department of Commerce, Bureau of the Census, *Twenty-First Census of the United States, 1990: Population and Housing*, Bureau of the Census, 1990, on CD-Rom.

45. Bureau of the Census, *Nineteenth Census, 1970, vol. 46*; Bureau of the Census, *Twentieth Census, 1980, vol. 46*; Bureau of the Census, *Twenty-First Census, 1990*, on CD-Rom.

Counsel saw no reason to impose acreage limitations on Scofield, because the water users already held the water rights, had a water supply, and they would receive a comparable supply from a new reservoir. Besides, imposed restrictions might meet resistance from the water users.[46]

Uses of Project Water

The Carbon Water Conservancy District (CWCD) was formed in 1943, under the terms of the Utah Water Conservancy Act of 1941. On October 11, 1943, PRWCD and the CWCD signed a contract with Reclamation for reconstruction of Scofield Dam. The CWCD signed a repayment contract with Reclamation on February 28, 1944, for $216,000, to be paid in forty annual installments. Reclamation maintained operation and maintenance responsibility for a few years after completion of Scofield Dam. On April 1, 1949, Reclamation turned operation and maintenance over to the Carbon Water Conservancy District. On May 26, 1944, the Utah Department of Fish and Game, acting for the state, signed a contract with Reclamation for use of the inactive capacity of Scofield Reservoir, to propagate fish, for $31,000. The inactive capacity totaled some 8,000 acre-feet, lying below the trashrack structure, which could not be emptied through the outlet works. The contract provided that the public would not be charged by Reclamation or the water districts for fishing or hunting on or near the reservoir.[47]

The Federal government viewed the Scofield Dam as a flood control measure to prevent damage to vital defense industries and transportation. For the local population, Scofield Dam and Reservoir also supplied irrigation water for surrounding farms. In 1943, local farms grew alfalfa, barley, beans, corn, oats, wheat, potatoes, sugar beets, and pasture. Orchard crops around Helper included peaches, pears, apricots, and apples. The town of Spring Glen was known for its berry crops.[48]

Crop values on the Scofield Project reached over one million dollars in the 1960s and

46. Bureau of Reclamation, "Memorandum to the Commissioner Re: Scofield Project, Utah," *Bureau of Reclamation Project Correspondence File 1930-45*, box 1023, file 301: Engineering Reports and Estimates thru April 1943, 16 October 1942.
47. Reclamation, *Project History, Scofield Project, 1944*, 13-5; Reclamation, *Project History, Scofield Project, 1976-78*, 4.
48. Reclamation, *Project History, Scofield Project, 1943*, 28; Reclamation, *Project History, Scofield Project, 1945*, 14.

early 1970s. From 1973 to 1974, crop values jumped from $1,552,089 to $3,672,419. During the drought of 1977, the value plunged to $1,515,005. Gross crop value reached four million dollars in 1981.[49]

The PRWCD maintained control of the water from Scofield Reservoir. The district's responsibility ended at the headgate of the canal, and the individual canal companies assumed responsibility thereafter. In 1946, the River Commissioner's report showed 15,361 acres of land irrigated by water from Scofield Reservoir, less than previous years when about 16,000 acres received irrigation water. The report attributed the lesser acreage to more accurate means of measurement rather than a decrease in cropped acreage. However, in 1947, the River Commissioner only reported 14,580 acres irrigated. The report still claimed the acreage deficiency stemmed from more accurate land measurements instead of lost acreage.[50]

In 1946, even though Reclamation began filling the dam during the winter, Scofield Dam only stored a maximum of 23,300 acre-feet, about 7,000 acre-feet less than previous years under the old dam. The shortage of water was blamed on low runoff and beginning the irrigation season thirty days before the average start date. The PRWCD requested permission from Reclamation to remove the trashrack bars and place a siphon in the trashrack to remove dead storage water.[51]

The district also filed suit against the Utah Department of Fish and Game. In the suit the PRWCD wanted to draw the reservoir down to 4,500 acre-feet. This occurred about the time that Utah Fish and Game paid $10,000 on March 1, 1946. The Department would pay the last $11,000 on October 11, 1946, to finish payment on the contract with Reclamation. The suit was settled by both parties agreeing to draw the reservoir down to 4,500 acre-feet if it proved necessary to save crops. Careful use of the available water alleviated any need to draw the reservoir down below normal dead water storage.[52]

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49. Reclamation, *Project History, Scofield Project, 1976-78*, 6; Reclamation, *Project History, Scofield Project, 1981-82*, 7.
50. Reclamation, *Project History, Scofield Project, 1944*, 38; Reclamation, *Project History, Scofield Project, 1946*, 25; Reclamation, *Project History, Scofield Project, 1947*, 9.
51. Reclamation, *Project History, Scofield Project, 1946*, 25.
52. *Ibid*., 13, 25-6.

Reclamation granted 321 acres to the Utah Division of Parks and Recreation in 1963, to develop a recreation area near Scofield. The land grant added to the recreation potential of Scofield Reservoir and the surrounding area. The contract between the Utah Department of Fish and Game contributed to fishing on the reservoir. Boating quickly became a staple activity at Scofield also, including annual boat races.[53]

Conclusion

Reclamation built the Scofield Project as a wartime exigency. Still in the middle of United States involvement in World War II, without a definite idea of when the conflict would end, the country still needed to use its resources to the fullest extent. Possible failure of the old Scofield Dam threatened some of the resources necessary for the defense industry, and part of the vast rail system required to transport material and military troops. Under those circumstances, Reclamation constructed a project which only replaced an existing structure, and in which few of the normal guidelines for Reclamation projects were observed.

About the Author

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53. Reclamation, *Project History, Scofield Project, 1981-82*, 6; Water and Power Resources, *Project Data*, 1141.

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