North Platte Project

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The North Platte Project

John C. Frémont got credit for leading the way. Brigham Young, Buffalo Bill Cody, and a generation of pioneers, plainsmen and petit-bourgeois town builders soon followed. Despite cave drawings confirming the presence of Indians thousands of years previous, the parade of history was loudest along the North Platte River during a 25-year window in the nineteenth century. Home to snakes, rodents and locusts, and etched by blizzards, blazing heat and incessant winds, this valley deep in America's heartland saw many pioneers pass through, but few stay. The river would take the spotlight soon after the creation of the United States Reclamation Service (USRS) in 1902. As a neophyte Federal department eager to create a national image for itself with engineers and the public, the USRS achieved the acclaim it coveted seven years later with completion of the Pathfinder Dam.

The 214-foot tall masonry dam was one of the largest structures of its kind in the world at the time of its unveiling. Commencing with Pathfinder, the North Platte Project went on to blaze trails for both Reclamation and the people of Wyoming and Nebraska. For the USRS, the North Platte Project was a testing lab for Reclamation's earliest attempts at design. A forge for many of the Service's first generation of engineers and administrators, North Platte tested its builders through brutal shifts of weather, handling an unreliable workforce, and adapting construction to meet the demands of location. For irrigators in two states, access to water ended the cattleman's monopoly of the land and raised agriculture to equal status in the region's economy. In this respect, the coming of the North Platte Project is a signpost denoting the end of one era and the onset of an increasingly domesticated West.

Project Location

Compared to most languid western tributaries, the North Platte often runs wild and mighty. But, like other rivers in the West, summer saps its strength. The North Platte is fed by a number of streams east of the Continental Divide from the mountains surrounding North Park in Colorado and the Encampment country of southern Wyoming. As the river climbs north through

central Wyoming and east on to Nebraska, the Pathfinder Reservoir gathers an average annual run-off of 1.4 million acre-feet from about 12,000 square miles. When first proposed in 1902, the concept of drawing water from three states for use by two states was unheard of.[1]

Bunched along a one-to ten-mile wide area, 390,000 acres of project lands hug the riverbank. Traversing 111 miles along the river's valley from farm town to farm town, the project starts in Guernsey, Wyoming, before stopping outside of Bridgeport, Nebraska. Water is provided primarily for irrigators gathered along 390,000 acres. The acreage is classified among four irrigation divisions: the Interstate, the Fort Laramie, the Northport, and the Storage. Two-thirds of all the project's irrigable land are associated with the four divisions, while the remaining third, or some 100,000 acres, are represented by 9 districts and canal companies receiving water under Warren Act contracts. Main features of the North Platte Project include the Pathfinder Dam and its million acre-feet capacity Reservoir southwest of Casper, Wyoming; Guernsey Dam and Reservoir; Whalen Diversion Dam; three regulating reservoirs (Lake Alice, Lake Minatare, Lake Winters Creek); 1,602 miles of canals and laterals; and, 352 miles of open drains. The dam also provides power generation, as 194 miles of electric transmission lines link a region that had only known campfires and lanterns a few years previous.[2]

After author Washington Irving visited "the Great American Desert" in the 1830s, his romantic history *Adventures of Captain Bonneville, U.S.A.*, described cliffs of clay and sandstone "bearing the semblance of towers, churches, and fortified cities." Irving's description of the future home of Pathfinder Dam is a Frederick Remington painting in words. A niche cut by nature into a fortress of rock, the dam nestles between the canyon walls three miles below the junction of the North Platte and Sweetwater Rivers. Ninety feet wide at the bottom and 200 feet wide at the top, the sides of the canyon's upper 75 feet are nearly vertical, and the dark,

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1. E. H. Baldwin, "Construction of the Pathfinder Dam, North Platte Project, U.S. Reclamation Service," in *Engineering News*, (October 29, 1908): 461.
2. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project*, Vol. 69, 1981, 1. In 1911, Senator Frances E. Warren of Wyoming sponsored legislation authorizing the sale of surplus water to nonfederal lands or individual holdings and the construction of drainage works for such lands. The result was the Act that bears his name.

perpendicular cliffs seem to be so close that they appear to be within reach of one another.[3]

In the North Platte Valley, teams and plows broke sandy loams to sow potatoes and sugar beets in land that previously supported buffalo grasses and prickly pear cactus. In the Project's eastern portion (Nebraska), rainfall is sufficient to grow crops, while in the western area (mainly Wyoming), conditions are arid. Ignoring this dichotomy, some pioneer producers believed the North Platte Valley held the potential to become the most productive farmland "outside of the fruit belt in California," despite North Platte's fleeting growing season of 180 days. Temperatures vary from lows of -45 degrees to highs reaching 106 degrees Fahrenheit. The approximate center of the project, Scottsbluff, Nebraska, receives anywhere from 9.4 to 20.7 inches of moisture annually, as most of that amount falls between April and July.

Historic Setting

Engineering and coincidence usually travel on separate plains, but one story about explorer John C. Frémont and a moment of misfortune on the North Platte, would inspire a later generation of American dam builders. An August 24, 1842 entry in his journal placed Frémont and his party passing through a "Big Cañon" on the North Platte, returning from an expedition to the Rocky Mountains. Making his way through the rapids by boat, he remembered, "we cleared rock after rock, and shot past fall after fall till the boat struck a concealed rock immediately at the foot the fall, which whirled her over in an instant," consequently losing his surveying instruments near the present dam site. Nearly sixty years later when it came time to christen the centerpiece of the North Platte Project, Frémont's nickname, "The Pathfinder" was the winning choice.[4]

Even before Frémont's mishap, the North Platte Valley was often unfriendly to outsiders. A land where man struggled "to adapt his living requirements to this somewhat sterile region in order to exist." At the time of the first contact with whites in the early nineteenth century, the

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3. Washington Irving, *The Complete Works of Washington Irving, Vol. XVI: Adventures of Captain Bonneville, U.S.A.*, (Boston: Twayne Publishing, 1977), 22.
4. John C. Frémont, *The Exploring Expedition to the Rocky Mountains, Oregon and California*, (Auburn, New York: Derby, Orton and Mulligan, 1854), 112; P. I. Taylor, "Pathfinder Dam," in *Dams and Control Works*, (Washington, D.C.: United States Government Printing Office, 1929), 28.

Teton, Cheyenne, and Arapaho Indians lived near the present site of the town of Guernsey, Wyoming. All of these tribes lived east of the Mississippi before migrating onto the plains in the 1600s, acquiring horses and adapting to the nomadic culture of other Plains tribes.[5]

The first recorded visit of whites to the North Platte Valley was in 1812. Trappers in the employ of fur magnate John Jacob Astor ventured down the North Platte back from the Pacific Coast making their first winter camp at a spot 15 miles north of what would be Casper. Later that winter the party stopped near the future site of Mitchell, Nebraska, the USRS project headquarters a century later. The fur traders path, blazed in the name of business opportunities, evolved into a passage for anybody with enough determination to chuck it all and head west. By the 1840s, the 2,020-mile long Oregon Trail, brought thousands from Independence, Missouri, to Oregon, California, and Utah. This push of humanity made the trail "the best known and most traveled route across the continent." Other ways west -- the Mormon, California, the Pony Express and Overland Trails -- all followed the North Platte River at some point.[6]

Stage stops, trading posts and Federal army forts all sprang up in the wake of increasing western migration. Fur traders ran Fort Laramie in 1834 until it was taken over by the government in 1849. Fort Laramie and Fort Casper are probably the two best known outposts of civilization from this time. The trail confirmed that Americans are a transitory people always looking to get someplace else faster. The next advancement in speed transpired in 1869, when the Union Pacific railway established transcontinental rail travel, relegating the Oregon Trail to folklore. Grass now grows over the 200 foot wide trail, distinguished from the general surroundings by the contrasting vegetation, marked occasionally by a pioneer's grave.[7]

A time and a land remembered by a Reclamation official as "the paradise of the cowmen," the 1860s initiated the next era of the North Platte's development. The newly opened Indian country south of the North Platte spurred the growth of the open range cattle industry

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5. United States Department of Interior, National Park Service, *Individual Area Narrative, North Platte Project, Wyoming and Nebraska*, (December 1940), 6.
6. U.S., Department of Interior, Bureau of Reclamation, *General Administrative and Project Records, 1902-1919*, Record Group 115, Box 744. (Record Group 115 hereafter known as RG 115).
7. George Wharton James, *Reclaiming the Arid West: The Story of the United States Reclamation Service*, (New York: Dodd, Mead and Company, 1917), 202.

across Wyoming and Nebraska. The cattleman's control of the prairie was also transitory, as homesteaders, blizzards, drought, improvements in cattle breeding, the rapid progress of sheep raising, and the advent of sod-house farmers, would all marginalize the cowboy and his stock's freedom to roam.[8]

Homesteaders faced their own separate collection of obstacles on the road toward establishing irrigation. In the 1880s, a handful of pioneers settled the north and south sides of the river, near the towns of Minatare and Gering, Nebraska. Against these pioneers were brutal dry spells, great distances from the railroad and other points of supply, and their own misconception that western Nebraska received as much rain as eastern Nebraska. These first irrigators worked together to dig small ditches to bring the Platte to their lands adjacent to the river. In the century's last decade, a common method of obtaining of water was by water wheel. The river's current powered a wheel hung with buckets that lifted water from the river before dumping it into canals. Ranch and cattlemen had the resources to take the next step beyond the water wheel by digging a series of small canals between 1887 and 1900 to irrigate 5,000 to 8,000 acre tracts along the bottom lands of the North Platte. One of their grand projects proposed the irrigation of 60,000 acres of table land on the north side of the river between the state line and Red Willow Creek in Nebraska. The drought of 1890, and financial reverses brought by the Panic of 1893, put an end to these plans.[9]

If a large scale irrigation project funded by state, Federal, or private means was ever going to come to the North Platte Valley, many with a stake in the Valley's well-being felt it would happen at Goshen Park, Wyoming, near the state line with Nebraska. Repeated surveys by private firms were conducted long before the passage of the Reclamation Act of 1902. In 1903, a preliminary canal was run from the town of Guernsey in hopes to divert the river with the help of a proposed 100-foot high dam and an elaborate 140-mile long canal system. An additional plan to build at canal from Fort Laramie was also discussed at this time, but the

8. C. J. Blanchard, "North Platte - The Interstate Project," in *Reclamation Record*, (November, 1917), 511.
9. U.S., Department of Interior, Bureau of Reclamation, RG 115, *General Administrative and Project Records, 1902-1919*, Box 744.

estimated $35.00 an acre to reclaim these lands killed Goshen Park Dam and stalled the proposed Fort Laramie Canal.[10]

A few months after the USRS was established, in the summer of 1902, government surveyors began to study the Sweetwater River as a possible dam site. First sipped and named by an Army officer noting its lack of alkali, the Sweetwater runs east through central Wyoming before emptying into the North Platte River southwest of the town of Alcova, Wyoming. Twenty miles above its mouth, the Sweetwater cut through a granite ridge forming a deep, narrow canyon. The pioneers passing a quarter of a mile away along the Oregon Trail named the geological feature, "Devil's Gate." Two years of surveying this niche resulted in Reclamation deciding against Sweetwater, as it did not supply enough water to justify construction of a big dam at that location. In 1903, as Reclamation began to look for other sites, the Wyoming State Hydrographer, A. J. Parshall, told USRS Chief Engineer Frederick H. Newell, about an excellent damsite in the "Big Cañon" below the junction of the North Plate and Sweetwater.[11]

In August, 1903, under the direction of USRS engineer John E. Field, a diamond-drill camp was set where the two rivers flowed through a narrow granite canyon. The remote site was impossible to reach by either road or boat, subsequently slowing arrival of equipment at the canyon. Once the machinery did arrive, drill operations were conducted from a boat. Despite the craft firmly anchored and tied, both boat and drill surged in time with the river's pulse. However, a month into operations, the crew's persistence paid off, as a trail of drill holes across the canyon revealed an excellent foundation of granite on which a dam could be built.[12]

Project Authorization

Despite their reputation for even-tempered fairness, there are a few issues that can rile the citizens of America's heartland. One contention of the 1880s and 1890s began as a war of words over water rights between the states of Wyoming and Nebraska. When Wyoming entered the Union in 1889, her state constitution claimed all the water in Wyoming belonged solely to the

10. RG 115, *General Administrative and Project Records, 1902-1919*, Box 739.
11. L. V. Branch, *Historical Sketch of the North Platte (Pathfinder) Project*, March 10, 1910, 3.
12. Taylor, "Pathfinder Dam," in *Dams and Control Works*, 28; Andrew D. Rogers III, *Federal Reclamation's Pioneer Period, Part I*, (Columbus, Ohio: 1966), 233.

state. Perhaps for the first time, Nebraskans saw red, and it was not out of local sporting fanaticism, but out of indignation that their access to the North Platte was in jeopardy.

Acting as peacemaker, Wyoming's state engineer, Elwood Mead, suggested to Nebraskans in 1893, that both states work together to seek Congressional appointment of a permanent interstate commission of the regulation of priority rights. Mead could add soothsayer to his list of abilities, as the United States Supreme Court later adjudicated both claimants rights. Mead's talents for stilling troubled waters would earn him the position of Commissioner of Reclamation from 1924 to 1937.[13]

The Newlands Act was actively championed by the Nebraska Congressional delegation at the turn-of-the-century, because they believed the federal government would mediate any water rights questions between states. Some in Wyoming grumbled that the construction of any federal dam would be done under "false pretenses" and their state would be deprived of what was rightfully theirs. Eventually, their support grew for the North Platte Project as reasonable way of dividing the waters. Presented to Secretary of the Interior Ethan A. Hitchcock as the Sweetwater Project, operations on the North Platte were authorized under the Reclamation Act of 1902 (32 Stat. 388) on March 14, 1903. The question of which state controls the North Platte has gone before the U.S. Supreme Court at least twice since the 1930s, and yet another case regarding use of the North Platte has been brewing since the mid-1980s.[14]

Construction History

Both Indians and Buffalo had been forced off the Great American Desert by American expansion. Now, it was Reclamation's obligation to tame one of the last settled places in the West. Foremost among the challenges was the location of the dam. A torturous forty-five miles from the largest nearby town, Casper, workers and material were always hard to come by. In 1905, a few months into construction, a Reclamation engineer lamented the "remoteness of the

13. Everett Dick, *Conquering the Great American Desert: Nebraska*, (Lincoln, Nebraska: Nebraska State Historical Society, 1975), 408-9.
14. Alfred James Mokler, *History of Natrona County, Wyoming, 1888-1922*, (Chicago: The Lakeside Press, 1923), 74-5; *Wyoming (Cheyenne) Tribune Eagle*, 6 June 1995, p. A-5.

project, the poor roads, in places little better than trails."[15]

As one of the Reclamation Service's first projects, the USRS often operated by trial and error at North Platte. Four months before Reclamation accepted bids on the dam, in February 1905, the Service awarded a construction contract for the dam's diversion tunnel to Kilpatrick Brothers and Collins Contracting Co. of Beatrice, Nebraska. The tunnel served two purposes, to carry the river around the dam site during construction and subsequently perform as an outlet from the reservoir. The tunnel was worked from two headings as crews dug with handtools for 11-and-a-half hours a shift. Fortunately, productivity increased after four electric and two steam drills replaced chisels and hammers. When Kilpatrick Brothers concluded work in August 1905, the 480 foot long tunnel through solid granite entered the canyon wall ninety feet above the upper face of the dam. It passes to the left (north) of the dam at a distance of about 85 feet from the canyon wall and enters the canyon again 230 feet below the lower face of the dam. The tunnel is 13 feet wide and 10 feet high in the center. Two vertical shafts, each about 170 feet, lead to the surface to a high pressure and sluice gate structures. The only major setback during this job came on May 23, 1905, two days after both sides met under the canyon. Spring runoff flooded the tunnel, dumping two feet of silt inside the corridor, marring completion of the project's first milestone.[16]

A triumph of early twentieth century design, built to master a century's worth of elements, the masonry arch Pathfinder Dam rises 214 feet from the bedrock of the canyon floor. Fanning out from top to bottom, Pathfinder tapers from a top width of 11 feet to a bottom width of 97 feet and a crest length of 432 feet. Sharing the same cyclopean rubble design as the Theodore Roosevelt Dam on Arizona's Salt River Project, Pathfinder does not have the same mystic aura of grit and grandeur, but the circumstances surrounding its completion are just as compelling. The dam is arched in plan to a constant center -- the radius to the axis is 155 feet. The upper portion of the dam is a combination of an arch and a vertical cantilever at the base.

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15. U.S., Department of Interior, Bureau of Reclamation, RG 115, *Project Reports, 1910-55*, Box 668.
16. RG 115, *General Administrative and Project Records, 1902-1919*, Box 739; Nello Cassai, "First Dam on the Wild North Platte," in *Reclamation Era*, (November, 1968): 104.

The distribution of the load between the arch and cantilever produces equal deflections under assumed temperatures and waterloads. The upper 27 feet of the structure are reinforced with steel on each face. Almost half of Pathfinder's masonry came from waste rock. There are no contraction joints except at a point near the south end. The attention paid to the dam's resilience was not happenstance, but born of a theory delivered to a gathering of engineers in Utah a few years previous.[17]

At a Conference of Engineers of the Reclamation Service in Ogden, Utah in September, 1903, George Y. Wisner, a Consulting Engineer to the USRS, presented a paper arguing the Reclamation Service would have to build masonry dams of great height to provide ample storage in the often parched rivers and reservoirs of the west. Wisner emphasized the importance of accurate data to determine the stresses these structures would undergo. His selection as Pathfinder's designer provided Wisner the opportunity to put his blueprints where his beliefs were. Wisner and Edgar T. Wheeler, a Los Angeles construction engineer, launched their investigations of the site in early 1905. In their report to the Board of Consulting Engineers of the Reclamation Service, both men emphasized the upper portion of the dam should receive extra protection to avoid cracking brought on by the region's wild weather. Wisner and Wheeler won the board over with a design that incorporated efficiency, safety, and economy.[18]

Finding a contractor and qualified men to execute Wisner and Wheeler's plans was more perplexing. The search for a contractor willing to assume the job began inside Denver's Chamber of Commerce building on June 15, 1905. That afternoon Reclamation announced Bradbury & O'Gara of Denver won the right to build the Pathfinder Dam. Later that month, the contractors went out to the damsite to find out what they had gotten themselves into. In two weeks time, Bradbury & O'Gara withdrew their $364,940 bid, explaining by letter to Frederick Newell, "we have made very grave and insurmountable errors in our original figures." Their price was 25 per cent below the next lowest bidder and was much less than the work could be done for. Now, the USRS faced re-advertising the bidding and throwing the preliminary

17. Taylor, "Pathfinder Dam," 28-31.
18. Cassai, "First Dam on Wild North Platte," 104.

construction work into the teeth of a high plains winter.[19]

The story of the bungled bids had one more chapter to go that summer. The work was re-advertised and the bids opened again on August 16. This time, the lowest bidder, N.S. Sherman of Oklahoma City, came in with a proposal of $459,260. However, Sherman's financial incapacity and lack of experience to construct a major dam was soon apparent. Their bid was rejected and the contract was awarded to Geddis and Seerie Stone Co., of Denver with the second lowest bid of $482,000. Geddis and Seerie's estimate would later climb to $626,523.52, due to the added cost of removing unstable rock from the canyon walls and the resulting expense of extra masonry. Geddis and Seerie's most recent triumph was the just completed Lake Cheesman Dam. Built for municipal use by the city of Denver, the gravity arch Lake Cheesman was the first substantial and continual on-stream storage facility of raw water for municipal use in the Rocky Mountain West. After Geddis and Seerie's selection, Wisner expressed his doubts about the Denver firm, proposing Reclamation should hire force account laborers. Having endured two bidding fiascoes, Wisner was overruled, and by the early autumn of 1905, many of those who built Cheesman picked up their tools and headed to Wyoming.[20]

It was the first of September before Geddis and Seerie could safely put the Pathfinder contract in their pocket. Their proposal covered construction of the dam, gatehouse, spillway, and hauling the cement from Casper over paths cut through prairie grasses and sagebrush by men and teams. Scrambling to beat the first north winds of winter, work commenced September 16 on the construction camp. Crews would complete a bunk-house, dining room, a house for the contractor, an office, a meat-house and cellar for vegetables, and two water closets "at a safe sanitary distance from camp." The month of November brought the plant, and in December, the contractor's men began building a temporary dam to divert the river while the permanent dam

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19. RG 115, *Project Reports, 1910-1955*, Box 668; U.S., Department of the Interior, United States Geological Survey, *Fourth Annual Report of the Reclamation Service, 1904-05*, (Washington, D.C.: United States Government Printing Office, 1905), 231; RG 115, *General Administrative and Project Records*, Box 761.

20. Eric B. Kollgaard and Wallace L. Chadwick, (eds.), *Development of Dam Engineering in the United States*, (Elmsford, New York: Pergamon Press, 1988), 346. Geddis and Seerie Stone also served as contractors for the Colorado State Capitol in Denver.

was raised.[21]

Starting while the days were warm would have made construction of the temporary diversion dam a quicker and cheaper job. Ice often covered the temporary rock-fill dam in the winter of 1905-06 and, consequently, the dam was not tight enough to stop leaking. A series of dams, each lower that the one above it, were built to control seepage aided by a timber flume and three 6-inch centrifugal pumps. A decision by Geddis and Seerie on where to locate a temporary diversion dam led to a major headache for both Reclamation and the contractor. Directly above the site of the proposed upper temporary dam, located at the edge of the canyon, was a large quantity of loose rock. Blasting the loose rock from the canyon walls would be the simplest way to proceed in the minds of the contractors. Hundreds of tons of rocks were dynamited, but the rock did not fall where intended, subsequently covering much of the river bottom with large stones. The crevices between rocks created an immense sub-drain that was impossible to fill, hampering the first season of construction operations.[22]

In spite of falling rock and seeping water, foundation excavation began in January 1906. Fighting to reach bedrock, crews often had to cut through several feet of ice in temperatures that plunged as low as -29 below zero. Advancing despite the cold, progress halted March 25 when the river rose, breaking up the 3-feet-thick ice and flooding the damsite. There was no serious damage to men or machinery, but it was August 15 before the first stone of the foundation was laid. The eventual depth of excavation for the entire foundation was only 10 feet.[23]

Pathfinder Dam grew from 55,000 barrels of cement and 60,210 cubic of yards of masonry. Local Newspaperman Alfred J. Mokler recalled the fastest trip by a freight team from Casper to Pathfinder took three days, while the longest lasted a staggering 76 days – a 45-mile trip made over low valleys and high hills in all kinds of weather. After a day's work, freight teams were unharnessed and turned loose on the range to feed, and frequently, many subsequent

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21. RG 115, *General Administrative and Project Records*, Box 761; Taylor, "Pathfinder Dam," 29; E. H. Baldwin, "Construction of the Pathfinder Dam, North Platte, Project, United States Reclamation Service," in *Engineering Record*, (November 7, 1908): 508.
22. RG 115, Box 668.
23. *Ibid*.

days were lost in search of wayward animals. Average cost of concrete delivered to Casper was $2.68 a barrel, but the contractor paid an additional $3 for the journey out to Pathfinder. Freighting outfits of all kinds and sizes were used, from a sheep wagon drawn by two horses and a mule carrying 24 sacks of cement to a 22-horse team drawing five wagons coupled together hauling 327 sacks weighing 31,000 lbs.[24]

Acquiring the stone for the dam was easier logistically, but this job, too, had its own inconveniences. Hard, coarse-grained granite was quarried within a quarter-mile of the dam. Pieces of rock forty feet square were first blown out of the canyon and split into smaller blocks averaging eight to 10 tons. After the blocks were dressed and drenched with water, the granite squares were placed into position by cables. The dam had to be as impervious as possible, meaning all voids filled and no leaks allowed. This was achieved with up to 10 inches of concrete mortar placed between the blocks. The best results came from "rich" concrete mixed very wet in order to fill every crack. Wet concrete was also much easier to work than a slightly stiffer mixture. This method also had economics behind it; use of more stone meant the contractor could use fewer barrels of the expensive cement. Before placing the mortar bed for a stone, the area was swept and wet with a hose, followed by a lot of prying and lifting by the masons to position the stone properly. The attention necessary to make this recipe of concrete, cement and rock to come out right triggered a Reclamation engineer to remember, "Every mason, helper, laborer, and all who took any part in the laying of stone or placing of concrete had it instilled into him at the outset that dirt was an enemy to impervious work and that its presence would not be countenanced."[25]

In spite of it being rough and remote, North Platte's plant was up-to-date by the standards of the first decade of the new century. Estimated to cost over $60,000, the plant's machinery included 10 guy derricks with 60-foot masts, 55-foot booms, two cableways spanning 350 feet, mixers, and a concrete mixing house designed so that one man could handle over 700 sacks of

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24. Mokler, *History of Natrona County, Wyo., 1888-1922*, 77; Baldwin, "Construction on the Pathfinder Dam, North Platte Project, U.S. Reclamation Service," in *Engineering News*, 463; *Natrona County Tribune*, 2 June 1909, p. 1.
25. RG 115, *Project Reports, 1910-55*, Box 668; Baldwin, "Construction of the Pathfinder Dam," 463.

cement in an eight hour shift while a second man mixed an equal amount into mortar and concrete at the same time. A certain number of strokes on a gong told each worker whether the cement coming down the chute was meant for either the concrete or mortar mixer. Economy also guided the layout of the plant, acknowledging the difficulty of keeping workers. Machinery was placed side by side under a shelter, so when engineers were scarce or work was slack, one engineer could run both hoists. The local scarcity of fuel to run all this machinery led to a separate project to find alternate materials to burn. Kilpatrick burned all the available wood during their tunnel operations, and oil and gas were too costly to obtain. This energy crisis forced Geddis and Seerie to obtain wood from the Pedro Mountains, ten miles south of the dam. Loggers at a mountain side camp sawed pine and cedar into cord wood for the next two years. The machinery burned five cords a day at a cost of $8 to $10 a cord. At construction's close in 1909, much of the equipment was left at the damsite. It was not worth it to Geddis and Seerie to freight it back to Casper by team and then ship it by rail on to Denver.[26]

As the dam rose, the diverted North Platte flowed through the diversion tunnel in the dam's northern abutment. The tunnel later served as a service outlet for the reservoir once the dam was completed. Two main outlets are part of the completed structure, one through each abutment. The 480-foot long north outlet is partially concrete-lined with two vertical shafts leading to the surface for the high-pressure and sluice gate structures. At the gates, the tunnel divides into two conduits controlled by two balanced needle valves. The south outlet is an arch tunnel also partially lined with concrete. The outlet is 15-feet wide by 14-feet high and 360-feet-long flaring at the upstream end to a width of 40-feet and a height of 30-feet to handle a concrete plug that containing six 58-inch Ensign-type valves. In 1958, the tunnel was abandoned and sealed off with concrete bulkheads. The power outlet works is located in the left abutment and consists of a trashrack protected intake structure; a 18-foot diameter pressure tunnel; a gate shaft and control house, and two 129-inch-diameter penstocks which lead to the Fremont Canyon Powerplant at the upper end of Alcova Reservoir. The power outlet works have a capacity of

26. Baldwin, "Construction of the Pathfinder Dam," in *Engineering News-Record*, 462; RG 115, *Project Reports, 1910-55*, Box 668; *Natrona County Tribune*, 2 June 1909, p. 1.

2,300 cubic feet per second (cfs), however, no water can be released from the reservoir until the reservoir water surface reaches an elevation of 5,850 feet. Power conduits No. 1 and 2 are 18 feet in diameter and about three miles long. Located approximately 243 feet downstream from the inlet is a control gate structure and shaft with a fixed-wheel gate installed.[27]

In the opinion of the man in charge of construction at the damsite, Ernest H. Baldwin, the one task that merited the title of "a nasty job," was the installation of a grizzly -- a grating preventing driftwood from lodging in the tunnel gate openings. While it "was a small piece of work," stormy weather and complications transporting equipment to the mouth of the tunnel made it the most exasperating element of construction. Located a half mile up river, the steep and rocky sides of the canyon made it impossible for a team to get near the work. Additionally, the force of the rapids at the canyon's upper end obstructed construction crews landing by boat. Getting in and around this tight spot, a 185 foot high chute tilted at a 66 degree angle traipsed its way from the top of the canyon to a point where teams could come close to the river bank. A tripod with a pully was built over the upper end of the chute and all materials glided to the riverbank down the chute.[28]

A nearly level natural channel lying 400 feet from the north side of the canyon constitutes the spillway. The uncontrolled, flat-crested weir on the dam's left abutment was widened to 650 feet by construction crews. Economy also guided the spillway's creation, as the rock used in dam construction formed the wasteway. The crest length is 535 feet at an elevation of 5858.1 feet with its guide wall standing 12-feet high. The spillway can carry 55,000 cfs at a depth of eight feet on the crest. A concrete weir, downstream from the main weir, sits at the low portion of the spillway channel. Located 184 feet above the stream bed, many irregular and large boulders cover the entire the channel.[29]

A quarter-mile south of the dam, crews built a dike to close a low gap a fourth of a mile

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27. Kollgaard and Chadwick, (eds.), *Development of Dam Engineering in the United States*, 353; U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Pathfinder Dam*, (Denver: 1986), 4-5.
28. RG 115, *General Administrative and Project Records*, 1902-19, Box 739.
29. *Dams and Control Works*, 30; U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Pathfinder Dam*, 4.

south of the dam in a natural depression to fully develop the reservoir's capacity. The Pathfinder Dike is 1,650 feet long, 20 feet wide on top with a maximum height of 38 feet, and an 8-inch tile drain laid in a trench downstream from the core wall to collect the dike's seepage. Paved with granite blocks 18 inches thick, weighing up to 400 pounds, the upstream face of the Pathfinder Dike resembles a jigsaw puzzle where the pieces do not fit. Construction began in March 1910, as 75 men and 50 teams of horses came from Denver that spring. Crews worked in two shifts of 10 hours each and the dike was finished by May of the following year.[30]

The Pathfinder Reservoir extends 23 miles up the North Platte River and 15 miles up the Sweetwater River -- a maximum width of four miles. The waters of the North Platte River have to pass the Seminoe and Kortes Dams of the Pick-Sloan Missouri Basin Project before entering the reservoir. Pathfinder can hold up to 1,016,000 acre-feet of water and covers 22,700 acres; enough to provide storage for irrigation in normal years and keep a large reserve to tide users over from a heavy run-off year into a dry year. Much of the reservoir covers land originally owned by the government, but it was necessary to purchase 6,812 acres of private land at a cost of $205,490 to fill the lake.[31]

As work progressed on the main dam, a diversion dam took shape east of the town of Whalen, Wyoming. On-site surveys progressed between January and April 1905. The design of the Whalen Diversion Dam was completed a year later, and the contract awarded to the firm of S. R. H. Robinson and Son in January 1907. Robinson and Son failed to make satisfactory progress on the job, pushing operations into the flood season of 1908. The firm's initial dam construction was too weak to withstand that season's highwater and the structure failed in May 1908. After the failure, the firm suspended construction long enough to irritate Secretary of the Interior James R. Garfield. Garfield cancelled the contract and directed further work done by force account. Completed in April 1909 at a cost of $235,010, the gravity, concrete ogee weir, embankment wing structure stands 35 feet high with a 2,460 feet crest. Since it first went into service, Whalen Diversion Dam has redirected the North Platte the south side of the North Platte

30. Taylor, "Pathfinder Dam," 31; RG 115, *General Administrative and Project Records, 1902-1919*, Box 739.
31. Taylor, "Pathfinder Dam," 31.

into the Fort Laramie Canal and the river's north side into the Interstate Canal.[32]

Many of the men guiding Pathfinder's creation would later influence and direct the engineering and administrative philosophies of the Bureau over the next five decades. Charles E. Wells supervised the North Platte Project from 1905 until December, 1907, until Ira W. McConnell took over as the project's supervising engineer for the final two years of Pathfinder's construction. From 1905 to June 1909, Canadian Ernest H. Baldwin was the engineer-in-charge of construction at Pathfinder Dam, succeeded by Harold D. Comstock from October 1910 to July 1913. Future Commissioner Harry Bashore also started his Reclamation career on the North Platte Project in 1906, a short while after receiving his civil engineering degree from the University of Missouri. Bashore was just one of a cadre of young engineers gaining experience at North Platte during 1906 and 1907. While some farmers grumbled the project was a "college" for young engineers, the presence of many young faces in positions of trust, reflected the great demand for engineers across the nation.[33]

If Pathfinder was the beginning of many careers in Reclamation, for those laboring to build the dam, it was a harsh job compounded by the isolation of the camp. From the first day Geddis and Seerie came to the Big Canyon, to the last scoop of earth dug out for the canals, finding qualified workers was a constant strain. Those used to hard work were the first to come on board, as one of the earliest contracts for stone cutters went to a group of Italian immigrants working at the Sunrise Iron Mines near Hartville, Wyoming. Recently arrived in America, the poor, working class of Europe, was well represented at Pathfinder. A 1968 article for *Reclamation Era* magazine remembered, "Unskilled immigrants and sons of immigrants bearing such names as O'Toole, Morelli, Weder, Kajutis, Geko, and Moore alternately sweat and froze for about 35 cents an hour between 1905-9 to erect this unique structure."[34]

The atmosphere of the construction camp was at a crossroads of behavior -- orderly or

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32. RG 115, *General Administrative and Project Records, 1902-19*, Box 739; U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project*, Vol. 52, 1964, 7.
33. Rogers III, *Federal Reclamation's Pioneer Period*, 246-7; RG 115, Oversized Records, Box 15, *North Platte Project Local Board of Survey: Minority and Majority Report*, 1916, 53.
34. Cassai, "First Dam on the Wild North Platte," 103.

unruly – and the possibility of a drift down the wrong road had Reclamation's management in a constant anxiety. In a July 7, 1905 letter from Newell to Arthur Powell Davis, the commissioner stressed the North Platte construction camp was in need of a good doctor to "aid in promoting efficiency." Related matters also troubled Newell, as he feared, "There will be many camp followers located in the outskirts of camp who must be watched continually and kept from making nuisances." Geddis and Seerie hired a doctor to look after the health of the men and be on hand in case of an accident. In addition to the weekly salary paid by Geddis and Seerie, the doctor received $1.50 a month from each employee to retain his services. An arrangement between the Federal government and Natrona County, Wyoming, bolstered the USRS's master plan of a hygienic, law abiding camp. The federally-appointed Sanitary Inspector did double-duty as the county's deputy sheriff. As Ernest Baldwin put it, "The two positions blended nicely as it gave the inspector certain authority in his sanitary trips." At the end of four years, it could be said the camp followed the path of righteousness, as only one arrest was recorded in that period.[35]

Reclamation and the contractor believed wages inducement enough for all kinds of workers to rough it for a few months on the prairie. Common laborers received 35 cents an hour during 1906-07, dropping to 30 cents an hour in 1908-09, as work reached completion. The money was also good for skilled laborers, as a driller received 37.5 to 42.5 cents an hour to while masons earned 70 to 85 cents an hour. According to Project Manager Andrew Weiss, "It was necessary to ship almost all men from Denver (300 miles to the south) and on average a poor grade of labor was secured. The force was continually changing, many of the men not staying long enough to work." Wages were not the only obvious division between management and labor. Housing and living arrangements also reflected the level of society you belonged to outside the camp. The wives and families of USRS and construction officials lived respectably in frame homes downstream from the dam. Laborers, with or without families, lived nearby in dugouts, tents, and shacks in the gullies adjacent to the construction camp. At Pathfinder, most

35. RG 115, *General Administrative and Project Records, 1902-1919*, Box 761; RG 115, RG 115, *Project Reports, 1910-55*, Box 668.

men worked six days a week with hunting and fishing the only diversions on their day off. An occasional Sunday brawl, often triggered by alcohol smuggled by wagon past the vigilant glare of tea-total Reclamation officials, added an occasional reminder that this still was the wild west. Even as late as 1920, help was hard to keep. Of the 240 men working on a Reclamation carriage facility, the Northport Canal, 183 of them quit within 90 days.[36]

There were no major mishaps during Pathfinder's long construction period, but tragedy struck after its completion. On the evening of February 9, 1912, five men crossing the canyon by aerial tramway to go back to camp for dinner, fell 186 feet to their deaths, when the cable carrying their car snapped. The men were installing a concrete ladderway on the canyon wall. According to a doctor at the scene, two of the men were so badly crushed that identification was impossible. The graves of two of those victims remain on a barren shelf overlooking the dam.[37]

The last full month of construction, May 1909, was nature's last revenge on the builders. The weather at Pathfinder alternated between cold, rainy, and windy. There were no great ceremonies marking completion of the $2.2 million project on June 14, but within days of its completion, Pathfinder was in the news.

In the days before satellite communication and instant media, the Pathfinder damsite might have been as far away from Denver, Colorado as events in the Balkans, or some other trouble spot in the summer of 1909. The previous winter, snowfall in the mountains of Wyoming and Colorado feeding the North Platte watershed, indicated heavy and dangerous run-off for the spring. Run-off measuring a million acre-feet above and beyond average annual totals had the project office worried. During the last week of June 1909, reports circulated that the top 40 feet of the dam had to be dynamited off to permit rising waters to spill over and relieve the pressure. From the middle to the end of June, almost four feet of water per day had gathered in the reservoir.

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36. Cassai, "First Dam on the Wild North Platte," 105-6; E. H. Baldwin, "Construction of the Pathfinder Dam, North Platte, Project, United States Reclamation Service," in *The Engineering Record*, (November 7, 1908): 511; U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project*, Vol. 14, 1920, 124-5.
37. *The Denver Post*, 10 February 1912, p. 1.

Rumors soon flowed as swiftly as the North Platte in late spring. The possibility of everything from the dam east to the town of Guernsey underwater prompted many to move to higher ground. These stories got the most play in Denver newspapers, topped with headlines like: "Great Pathfinder Dam Weakens and Puts Hundreds in Peril," and "Pathfinder Dam is Threatened with Destruction." That same week, the *Denver Post* sent one of its reporters to "engage the fastest automobile" and give an accounting of "nothing but absolute facts." Once at the site, the reporter was relieved to write "the mammoth and costly pile of granite and mortar" was by his own inspection, and the counsel of USRS officials, indeed "safe." In the summers that followed, the nervous of Casper warily waited through spring until the reservoir receded late in the season. An annual ripple of panic was enough for Frederick Newell to defend Pathfinder in the 1920s, insisting there was no structure in the United States "better designed and finished and more deserving of higher commendation for its stability," and "The absurd stories sent out concerning it cannot fail to do harm in alarming timid people, who have absolutely no occasion for concern." Time has proven Newell correct.[38]

In the summer of 1995, the Wyoming Water Development Commission and Reclamation studied alternatives to add storage at Pathfinder, as silt clogged the reservoir. A plan to add 2 to 2.5 feet to the top of the dam would be the first tuck performed on the its facade in ninety years. The addition would cost less than constructing a new facility on Deer Creek, a North Platte tributary, Deer Creek. If the addition goes through, it would not alter the engineering mastery of Pathfinder Dam. The skill of those who created the dam was honored in 1971 with a listing on the National Register of Historic Places. A 1986 analysis of the condition of the dam tendered a tribute from a later generation of engineers: "Construction of Pathfinder Dam and Dike was a major accomplishment, especially considering the primitive equipment available at the time."[39]

Post-Construction History

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38. *The Denver Post*, 30 June 1909, pp. 1, 8; 20 June 1909, p. 2; Andrew Weiss, "The Filling of Pathfinder Reservoir," in *Reclamation Record*, (December, 1914): 463; Mokler, *History of Natrona County, Wyo., 1888-1922*, 79.
39. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project*, Vol. 69, 1981, 9; *SEED Report on Pathfinder Dam*, 28; *Wyoming (Cheyenne) Tribune Eagle*, 6 June 1995, p. A-5.

In the West created by Reclamation, there is never an idea completely thrown away. In the 1920s, the Bureau recycled a turn-of-the-century private scheme at Goshen Hole, Wyoming into the Guernsey Dam Project. Before the Bureau's second chapter on the North Platte could be written, a network of canals, dams and power stations had to be dug, formed and put on-line.

From 1905 to 1924, over 2,000 miles of canals, laterals, and drains were dug across Wyoming and Nebraska. This network of waterways was needed soon after Pathfinder's completion. In 1912, a Reclamation operation and maintenance study reported rising groundwater interfered with farming operations, becoming "a menace to the sanitary conditions" of the town of Mitchell, and other areas through the project. Work on the first of the canals, the Interstate, took place from 1905 to 1915. From Whalen Diversion Dam to the Nebraska state line, armed with Mormon scrapers, canal diggers crossed broken-hill sand country facing a construction dilemmas very different from those found at Pathfinder Dam. The Interstate has an initial capacity of 2,200 cfs and follows the contours of the Nebraska prairie for 95 miles to Lake Alice and Lake Minatare Reservoirs northeast of Scottsbluff. Interstate has a bottom width of 34 feet and its water depth is 10 feet. On June 1, 1926 the Interstate Canal was turned over to the Pathfinder Irrigation District for operation and maintenance.[40]

Named for Alice Roosevelt, the most acerbic of Teddy Roosevelt's six children, Lake Alice sits nine miles north of Scottsbluff. The 11,020 acre-feet capacity lake was created between 1911 and 1913 by two homogeneous earthfill dams situated in natural depressions at east and west ends of the reservoir. The 37-mile-long High-Line Canal extends from Lake Alice to the southeast. High-Line's diversion capacity is 160 cfs, and the construction period was 1910 to 1913. The 62,200 acre-foot capacity Lake Minatare sits off-stream 11 miles northeast of Gering, Nebraska. The lake receives inflows from Guernsey Reservoir via the Interstate Canal. The Low-Line Canal extends from Lake Minatare southeast. It is 44 miles long and has a diversion capacity of 343 cfs. The Reservoir Supply Canal runs from Lake Alice to Lake Minatare carrying water to other reservoirs, which are usually filled each year before the start of

40. RG 115, *General Engineering*, Box 908; *General Administrative and Project Records*, Box 845.

irrigation season. In 1920, five years after the completion of Minatare Dam, a portion of the concrete face of the earthfill dam was blown off during a wind storm. Gusts carried away 150-feet of facing, but no one was injured and the dam remained intact.[41]

The Fort Laramie Canal has an initial capacity of 1,500 cfs watering a winding 130-mile area from the Whalen Diversion Dam to an area south of Gering, Nebraska. Construction of the canal took place over a nine-year period from 1915 to 1924. At the end of 1926, the Goshen Irrigation District assumed responsibilities for the Fort Laramie Canal in Wyoming and the Gering-Fort Laramie Irrigation District took over the Nebraska portion. Completed in 1919, the Lingle Powerplant drew its water from the Fort Laramie Canal. During the early years of operation, the plant furnished electricity to draglines working the project. The 1,400 kilowatt plant that supplied power to the area was taken out of service on May 1, 1956.[42]

Water diverted near the Wyoming-Nebraska State line is carried 80 miles through the privately-owned Tri-State Canal to the headgate of the Northport Canal and lateral system, facilities owned by Reclamation. Located near the town of Vance, Nebraska, control of the Northport Canal was transferred the Northport Irrigation District in late 1926. This system serves both the Northport Irrigation District and the east end of the project. Fighting the dual dilemmas of silt and seepage, most of the 352 miles of open drains and 28 miles of closed drains were dug after completion of Pathfinder and before Reclamation began construction on the Guernsey Dam.[43]

Reclamation made plans to build a companion dam to Pathfinder, years before the canals were completed. In 1915, eastern Wyoming residents in search of electrical power first discussed the possibility of constructing a reservoir near Guernsey, Wyoming. It took almost a decade before Guernsey Dam and Reservoir was authorized on Capitol Hill, as the 68th Congress allotted an $800,000 appropriation for construction on December 5, 1924. The Utah

41. W. H. Fisher, "Repairs to Pavement, Minatare Dam, North Platte Project, Nebraska-Wyoming," in *Reclamation Record*, (September, 1920): 418-9; U.S., Department of Interior, Water and Power Resources Service, *Project Data*, (Denver: 1981), 703-7.
42. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project*, Vol. 69, 1981, 1.
43. *Ibid*.

Construction Company of Salt Lake City was the only firm bidding to build the dam. After the government accepted their $1.2 million offer, the contract was officially signed on May 2, 1925. Utah Construction set to work three weeks later led by two carloads of equipment and materials. A temporary tent camp was set up the same day. Later that summer the camp grew to include an office building, warehouse, pool hall, mess house, bath house, root cellar, 12 cottages and 16 bunk houses.[44]

Construction was in full swing by the summer of 1925 with 200 men working in and around a small canyon where the river flowed between steep hillsides. The plant included a crane, locomotives, dump cars and other rolling stock. The dam site was located at the mouth of a small canyon. Steam shovels equipped with wide, shallow dippers gathered large amounts of broken rock for the dam's embankment. The shovels dumped the material into steel boxes or skips for loading and transporting to the dam. The work could be dangerous, as in August, an employee of the contractor was killed by falling rock tumbling from the slopes of the dam's downstream portal.[45]

Guernsey Dam was formed of sluiced clay, sand and gravel with a downstream section of rockfill. The material was hauled to the damsite by trains and dumped from trestles on each side of the embankment. The central portion of the dam is a clay-puddled core founded in an open trench 30 feet below the river bed and extended above continuously through the main embankment to the crest. A three foot layer of rip rap was spread over the dam's face by hand and the going was slow. Limestone and dolomite was spread uniformly near the top of the parapet wall to prevent the reservoir waves from damaging the upper slope of the dam. The crest of the dam is reinforced with a concrete parapet wall extending three feet above the top of the embankment on the upstream side and a low concrete curb on the downstream side. There is no record of seepage leaking through the dam. Standing 135 feet high and 560 feet long across its crest, Guernsey's embankment contains 586,000 cubic yards of material. Guernsey Dam was

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44. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project*, Vol. 13, 1925, 16-7. The North Platte's maximum run-off record of 2.6 million acre-feet was measured at the Whalen Diversion Dam nine miles downstream.
45. RG 115, *General Engineering*, Box 908.

completed on July 13, 1927, and the powerplant went into operation two days later. F. F. Smith, who spent most of his Reclamation Service career in Montana, served as construction engineer.[46]

Originally equipped to hold 72,000 acre-feet, the Guernsey Reservoir regulates the water released from Pathfinder and stores the river's inflow. The reservoir also provides 6,000-kilovolts of power, interconnected with a government-built power plant at Lingle, Wyoming, serving an area between Casper and Scottsbluff. The power outlet works intake is controlled by a 20-by-26-foot side roller gate covered by a trashrack structure. The water flows through a concrete-lined 20-foot-diameter shaft discharging into a desilting chamber. A 12-foot-diameter, 662-foot-long concrete penstock tunnel branches from the desilting chamber before making its way to the power turbines.

It can run smooth, or quickly harden like concrete. But, at any viscosity, silt is the bane of western water projects. Guernsey Reservoir is no exception, so water flows into a desilting chamber before it is sluiced into the bend of the south spillway tunnel through three 5-by-5-foot high pressure slide gates at the downstream end of the chamber. In spite of this precaution, silt is choking the reservoir. By the 1970s, the original capacity of 73,810 acre-feet had been reduced to 44,800 acre-feet.[47]

Aesthetically pleasing, but completely at odds with its surroundings, is the dam's gate house on the north spillway. An elegant, classical arch more likely to be found in a city park than near sandstone hills and cedar, the gatehouse controls a 434,000 pound, 50-by-50 foot Stoney gate for regulation of up to 52,000 cfs of irrigation flow. The south spillway is a 128-foot long morning glory spillway controlled by two 64-by-14.5 foot drum gates. A decade after Pathfinder Dam was so honored, in 1981, Guernsey Dam, Powerplant and Gatehouse also was placed on the National Register of Historic Places.[48]

Depression and drought, not prosperity, gripped the prairie as America turned the corner

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46. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, North Platte Project,* Vol. 15, 1927, 15, 32; Nalder, "Guernsey Dam," 59; U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Guernsey Dam*, 5.
47. W. H. Nalder, "Guernsey Dam, North Platte Project, Nebraska-Wyoming," in *New Reclamation Era*, (December, 1928): 184; *SEED Report on Guernsey Dam*, 6.
48. *SEED Report on Guernsey Dam*, 5.

from the twenties to the thirties. A remedy to the despair and loss of purpose America's workers felt at the beginning of the decade, the administration of President Franklin D. Roosevelt instigated a barrage of Federally-funded programs. One of the beachheads of this campaign landed on the south side of Lake Minatare in the summer of 1934. Camp BR-1 was established May 21, 1934, as the first Emergency Conservation Works (ECW; the predecessor of the Civilian Conservation Corps) camp assigned to the Bureau of Reclamation. Enrollees at BR-1 would build ditches, plant trees to "make the soil lay down," develop recreational facilities, and kill gophers. Unlike other 18-to 19-year-old enrollees in federal programs excited with their first taste of responsibility, the two hundred men at Camp BR-1 had served in World War I. These veterans of earlier battles soon realized that the North Platte would be of no value if the wind kept blowing topsoil into the canals. The former doughboys planted a forest of trees as wind breaks; preventing eastern Nebraska from blowing into western Wyoming. The ECW men had another reason to hate dustclouds, as one remembered the "wind always began blowing at mealtime and filled up the mess kits with sand."[49]

Rerouting and lining of canals with reinforced concrete and constructing permanent control structures were the major accomplishments of ECW, and later CCC, enrollees. From August 1, 1934 to January 9, 1936, BR-1 camp alone planted 73,944 trees as wind breaks, eradicated 1,005 acres of cockle burrs, and wiped out countless gopher colonies. For eight years, from the heart of the depression to the first stirrings of World War II, a total of five ECW and CCC camps were located within the North Platte Project, including Lake Minatare. These were: Guernsey (BR-9); Mitchell (BR-53); Bayard, Nebraska (BR-61), and Veteran, Wyoming (BR-83). At all camps, crews were set aside to improve the project lakes for recreation and build tourist stops like the museum at Guernsey Reservoir. As the war heated up, the CCC wound down, and the last camp on the North Platte closed in 1942. The improvements the enrollees

49. U.S., Department of Interior, Bureau of Reclamation, RG 115, *General Records of the Bureau of Reclamation Relating to CCC Activities, 1937-43*, Box 124; *Scottsbluff Daily Senator*, 6 April 1937, p. 3.

brought to the region made Project lands a better place to live in and visit.[50]

A moment of precaution, forgotten for 40 years, was uncovered by a rehabilitation crew in 1949. During a regrouting project on the Pathfinder's downstream face, an old ladderway was removed to reveal five sealed drill holes loaded with live dynamite. The project office reviewed the reports from June 1909, and acquainted themselves with the flood scare of that spring. When destruction threatened the Pathfinder Dike, Reclamation decided to drill five holes and place dynamite to blow a tunnel through the dam to release the flood waters and save the dike. A 10- by 20-foot tunnel would have demolished 210 of the dam's 65,700 cubic yards of masonry. Fortunately, the waters receded, the blast never happened, the threat passed. Unfortunately, no one went back to remove the dynamite. The dormant explosives spent the next four decades inside the dam alternately freezing and thawing. After their discovery, Reclamation discussed the situation with several explosive firms before hiring a Casper oil field torpedo man to remove the mortar caps with an oak wedge and neutralize the dynamite with solvent.[51]

Although the North Platte Project was completed in the mid-1920s, the government built other components linking later projects on the river. The dams and reservoirs of the Kendrick Project benefit an area west of Casper, and the Kortes and Glendo Units of the Missouri River Basin Program are also located in the same area. Transmission lines serving that region are interconnected with other Bureau systems as part of the Missouri River Basin Project. One hundred and ninety-four miles of 34.5 kV project transmission lines distribute power throughout Wyoming and Nebraska. Pathfinder Dam provides facilities for the Fremont Canyon Powerplant, part of the Glendo Unit of the Missouri River Basin Project. Completed in 1961, a pressure tunnel from Pathfinder Reservoir connects the North Platte Project to Fremont Canyon. The waters of the North Platte must pass through the Seminoe and Kortes Dams before entering the Pathfinder Reservoir. During the non-irrigation season, a small amount of water is released to satisfy other water rights, enhance fish and wildlife, and operate other power plants

50. RG 115, *General Records of the Bureau of Reclamation Relating to CCC Activities, 1937-43*, Box 124; R. B. Balcom, "The Recreational Development of Lake Minatare," in *The Reclamation Era*, (May, 1940): 129-30; *Mitchell Index*, 23 January 1936, p. 3.
51. A. W. Simonds, *Western Construction News*, December 15, 1949, 71.

downstream, and during irrigation season, water is released as required.[52]

Settlement of Project

Buyer beware was thrown to the prairie winds at the turn of the century, as many, best described as agriculturally naive, immigrated to the North Platte Valley. "Rain following the plow" stopped in eastern Nebraska, and the western half of the state needed all the water it could get. In the years after the Reclamation Act, private firms talked of digging ditches to attract immigrants to rolling tracts of western prairie. New arrivals came without the blessing of the Federal Government. Novice farmers settled places where no one was sure if they would ever receive water from any public or private source. In August 1908, almost 150,000 acres of land around Goshen Park Canal and 60,000 acres surrounding Fort Laramie Canal, both in Wyoming, were withdrawn from all forms of entry by the Federal Government to discourage a land rush before these areas were developed.[53]

The mood inside Reclamation was decidedly against speculators and unready irrigators. Andrew Weiss wrote to USRS supervising engineer Ira McConnell in 1909, expressing his doubts over settling lands where canals could not yet reach. Weiss also believed extreme harm might result if the valley rapidly converted from grazing lands to irrigation acreage, "There are a number of speculators who hope to derive profits from the sale of these lands and who locate people in that territory at the same time instilling the false hope that water is near at hand." Weiss added he was in favor of the status quo, "I believe the country is better off to be left in the hands of the cattlemen until such time as water may be furnished." Reclamation statisticians believed it would require capital of $1500 to $2000 for men of average industry and ability to make a go of farming. Often times, growers held 120 or 160 acres, but the surrounding dry, unirrigable soil brought most owners holdings down to approximately 80 acres. By 1911, the value of 80 acres of project land averaged $300 to $2,500 depending on its location and quality of soil.[54]

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52. Kollgaard and Chadwick, (eds.), *Development of Dam Engineering in the United States*, 352.
53. RG 115, *General Administrative and Project Records, 1902-1919* Box 739.
54. RG 115, *General Engineering*, Box 908.

Most newcomers chose to farm on sandy soils and lighter sandy loams, a wise choice as 75 percent of project land was sandy loam. Winds carried topsoil constantly on the high prairie, compounded by farmers leveling their acreage in preparation for irrigation. Strong gusts could blow seed out of the ground in a newly planted field and pile the plowed soil against a boundary fence. Application of water was another complication, as unskilled irrigators often washed the valuable top layer of soil.[55]

Soon after Pathfinder's completion, unhappy stories of unprepared irrigators made the rounds. In May 1913, a sardonic correspondent to the *Mitchell Index* newspaper recalled one homesteader who "suicided (sic) drowning in a ditch; at the time some thought he was insane, but in the light of later developments in the management of the project, it may be that he could look ahead and knew what he was about." Starting with $3,500 in capital in 1908, D. L. McDonald, after five years wound up $800 in debt. Looking at his ledger in the spring of 1913, McDonald declared, "I have raised probably $700 worth of stuff on my 80-acre farm. When I've paid my fixed charges and my coal and doctor bills, I have left $270 worth of produce to keep my family and my stock for a year. And I can't sell the stuff." Others believed soaking a field would bring abundant crops, but most often brought seepage from the canals and rising ground water. As early as 1916, 6,000 acres were unfit for cultivation because of seepage. Sure signs of unsuccessful farming were two room shacks "made of rough boards and covered with tar paper, loosened by the wind and weather" in places known by the locals as "Poverty Row."[56]

The prosperous few often came from eastern Nebraska, northern Colorado and other adjoining areas. These farmers carried the knowledge of conditions similar to those found in the North Platte Valley. One productive community was Dutch Flats, Nebraska, north of the town of Morrill. Composed mostly of farmers from eastern Colorado, the irrigators of Dutch Flats remembered the lessons learned in similar circumstances in Colorado. They knew the soil on its own was not very fertile, but with intelligent preparation and treatment, it would develop into good farmland. Growers planted alfalfa first to stimulate the soil, followed by sugar beets the

55. RG 115, *North Platte Project Local Board of Survey: Minority and Majority Report, 1916,* 53.
56. RG 115, *General Administrative and Project Records, 1902-1919,* Box 744.

following seasons. Sugar beets production attracted an inordinate number of German-speaking Russians. Within a generation this minority went from farm labor in others' fields to owning their own acreage to become the backbone of the sugar beet industry in Nebraska, Wyoming, and Colorado.[57]

Successful or not, the capricious sky was not the only force against all irrigators. Another affliction came from underground – gophers. A typical year was 1917, when Reclamation's Operation and Maintenance (O&M) forces trapped 5,000 of the rodents, while an additional 41,900 were captured by local farmers. A local water users association paid a bounty of ten cents a gopher. Grasshoppers were another pest, and the methods to eradicate them were much more toxic. A mixture of sodium arsenate, molasses, anise oil, sal soda and bran were put in 100 lb. sacks as hors d'oeuvres of death for the "locusts." One-and-a-half million pounds of the tainted treat were placed on irrigated land in 1919 alone.[58]

Settlement entered a new phase after World War I, but the odds of making it were still long. Resembling a chautauqua gathering or revival meeting, some 3,000 ex-servicemen gathered the under the trees of the Torrington, Wyoming, municipal camp ground in September, 1921. The second Federal land giveaway in an year, these men came from across the United States awaiting the announcement of who would receive 224 farms in a drawing. A year previous, Andrew Weiss tracked the fortunes of 80 solider entries from the 1920 drawing in a projected three-year study. The findings were in-depth and disheartening. In 1920, Weiss and his staff counted 66 owners and five tenants of prior military background as entrymen. Three years later, Weiss described an "exodus" had occurred, as tenants outnumbered owners 51 to 25. One of those early lottery winners, George "Doc" Haas, remembered in 1947, that many of the battle tested veterans were novices when it came to irrigation farming. "We had every kind of ex-solider, from piano tuners to paper hangers," Haas said. "Too few of us remembered to forget that there are hours in the day and days in the week. We did not realize there was no let-up in

57. U.S., Department of Interior, Bureau of Reclamation, *Special Report on 80 Soldier Entries of March 5, 1920*, Mitchell, Neb., November, 1924, 14.
58. RG 115, *Project Reports, 1910-55*, Box 668; *Reclamation Record*, October, 1920, 455.

work, season after season." At the time of Haas' comments, only 19 of the original 130 lottery winners from 1921 still farmed on the Project.[59]

An old affliction returned to the North Platte Valley in the 1930s on winds brought by dust clouds and under the blaze of endless sunshine. Lack of rain pushed one Nebraska editorial commentator to gripe during the summer of 1930, of the North Platte, "There's not enough water left in the river bottom to make a good 'chaser' for a slug of corn 'likker.'" A year later in September, 1931, the reservoir went completely dry, but fortunately the season was over. Like other people on other projects, the determined somehow made it, while others were determined to make it somewhere else.[60]

A string of small towns spreading across 98 miles, each 8 to 15 miles apart from one another, are clustered throughout the North Platte Project. Following north to south on a map the towns of Guernsey, Lingle, and Torrington in Wyoming, and Henry, Morrill, Mitchell, Scottsbluff, Minatare, Bayard, and Bridgeport, in Nebraska, owe their survival to the Federal water project. The largest town of this group, Scottsbluff, once was home to the second largest sugar beet factory in the West. A culture unique in farming, the American sugar industry was always profitable until it faced extinction starting in the late 1970s. A series of body blows to sugar production began with the expiration of the federal Sugar Act in 1974, the financial difficulties and eventual bankruptcy of Great Western Sugar in 1984-85, and many Americans losing their taste for sugar in favor of artificial sweeteners. Sugar beet growers mustered their resources and rebounded by the close of the eighties. By 1991, 54,878 acres of North Platte project land produced a sugar beet crop worth $47.1 million. Reflecting the reality of most small-towns in the mid-west and west, service industry jobs replaced working out on the land as most people's main occupation. Scottsbluff's population has dipped slightly over a 20 year period, from 14,507 in 1970 to 13,711 in 1990. Despite recent uncertainties, agriculture brought people to the North Platte Valley in the first place and its influence will continue to be felt for

59. C. J. Blanchard, "North Platte Project Land Opening," in *Reclamation Record*, (October, 1921): 451; U.S. Department of Interior, Bureau of Reclamation, *Special Report on 80 Solider Entries of March 5, 1920*, 14; Vaughan Mechau, "Veteran, Wyoming," in *The Reclamation Era*, (May, 1947): 119.
60. RG 115, *North Platte Project, Project Correspondence File, 1930-45*, Box 801.

many years to come.[61]

Uses of Project Water

From what was once was sagebrush and rangeland, 335,000 acres along the North Platte Project produced dry beans, corn, alfalfa hay, and potatoes. However, since the turn-of-the-century this region's fortunes have been bound to one unassuming crop.

As southern France is climatically correct for raising grapes for wine, eastern Colorado, southeastern Wyoming and western Nebraska are best suited for harvesting sugar beets. Favorable temperatures, the right number of days of sun, dry autumns and cool evenings all make a case that the North Platte Valley is the Champagne region of beets.

Every fall, the stench of burning sugar beets wafting from the smokestacks of the processing factories signaled beet checks would soon go out to growers up and down the North Platte Valley. The odor, and financial returns, were difficult to avoid as seven plants -- six owned by Great Western Sugar and one belonging to Holly Sugar -- were located within miles of one another across Wyoming and Nebraska. By 1930, the six Great Western Sugar plants were manufacturing approximately 2.5 million 100-lb. bags of sugar a year. Once sugar beets established agriculture in the valley, cattle were pushed back to the tablelands, but they were not completely out of the picture. Sugar beets are known as "two crops in one," because beets are also used as stock feed. Cattle consumption of the beet's top and pulp eventually returns to the soil the much of the fertility beets draw out. More than 50,000 head of cattle, 350,000 head of sheep, and 50,000 hogs are finished in the North Platte Valley each year.[62]

As the only water recreation facilities within 75 miles, there is additional emphasis on protecting the water fowl, boating, and swimming activities on project lakes. Geese, mallards, bluewings, sandhill cranes, and pelicans have made the North Platte Valley a stopping point on their migrations for millennium. In 1909, President William Howard Taft signed an executive

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61. James, *Reclaiming the Arid West*, 214; U.S., Bureau of Census, *1990 Census of Population and Housing, West North Central Division, Nebraska*, Summary Tape File 3A, Washington, D.C.: 1992; *Rocky Mountain News*, 31 March 1985, p. 98.
62. *Scottsbluff Star-Herald*, North Platte Valley Edition, (April, 1932), p. 20; Dick, *Conquering the Great American Desert: Nebraska*, 157.

order to create the Pathfinder National Wildlife Refuge. Recreation at Pathfinder Reservoir is administered by the Bureau of Reclamation, and the Fish and Wildlife Service manages the National Wildlife Refuges.

The arrival of the North Platte Project in an area branded as a desert was a stunning and rapid transformation. From the first deliveries of water in June 1909 to the early 1990s, project lands produced nearly $2 billion in crops, and are seven times more valuable per acre than average adjacent dryland. An acre of irrigated land outproduces the dryland by a ratio of 13 to 1. By the mid-1970s, Nebraska trailed only California and Texas in total irrigated acreage. The transformation brought by the North Platte Project, once it caught hold, was carried statewide with a great deal of success.[63]

Conclusion

Like the man who inspired its name, the Pathfinder Dam led the way for new ideas. For Reclamation, Pathfinder encouraged the build big philosophy and the adaptive attitude necessary to finish the early federal dams. And despite early bad press, the project survives. The project also brought about a shift in the local economy, leading to greater diversification among more people. While conditions at first were rugged for builders and those who initially broke the soil, the rewards continue to the present day.

Suggested Readings

E. H. Baldwin, "Construction of the Pathfinder Dam, North Platte Project, U.S. Reclamation Service," *Engineering News-Record*,, (October 29, 1908): 461-3;

L. V. Branch, *Historical Sketch of the North Platte (Pathfinder) Project*, March 10, 1910; Nello Cassai, "First Dam on the Wild North Platte," *The Reclamation Era*, (November 1968): 102-6.

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63. *Development of Dam Engineering in the United States*, 354; *Annual Project History, North Platte Project*, Vol. 69, 1981, 1; Dick, *Conquering the Great American Desert: Nebraska*, 417.

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