

Huntley Project

Timothy A. Dick
Bureau of Reclamation
1996

Table of Contents

Huntley Project	2
Project Location	2
Historic Setting	3
Project Authorization	4
Construction History	5
Post-Construction History	10
Canal Extensions	10
Drainage	12
Yellowstone River Diversion Dam	14
Anita Dam and Reservoir	14
Settlement of the Project	15
Uses of Project Water	18
Conclusion	18
 Bibliography	 20
Manuscript and Archival Collections	20
Articles	20
Books	20
 Index	 21

Huntley Project

Irrigation of western lands by Reclamation did not always occur in heavily settled areas. The Huntley Project exemplifies how a Reclamation project lead directly to the development, settlement and agricultural growth of a previously unfarmed area. Lands purchased by the United States from the Crow Indian Reservation were transformed from sage-covered range to farms blanketed with fields of sugar beets and alfalfa.

Settlers homesteading on project lands endured periods of slow, steady growth coupled with financial hardships. Farmers able to negotiate the difficult times prospered and grew as the project developed. Success of the project can be attributed to the ambitions and determination of the settlers who overcame strife to become successful farmers.

Project Location

The Huntley Project is located in south central Montana's Yellowstone County. Twenty-seven thousand acres of irrigable land lying south of the Yellowstone River between the towns of Huntley and Pompeys Pillar are included in the irrigation system. Water is diverted from the Yellowstone River Basin by a diversion dam two miles above Huntley. A 32 mile main canal carries water in a easterly direction to irrigate a strip of land ranging from one to four miles in width.¹

The first 13.77 miles of the main canal distributes irrigation water through a gravity flow system. A pumping plant at this point raises the water 44 feet to the High Line Canal servicing 5,000 acres of otherwise nonirrigable land. Next to this primary plant is a pumping auxiliary plant, installed in 1917-1918 for use when extra water is required.

Three irrigation divisions are included in the Huntley Project. The Pryor Division contains 24,423 acres north of the Main Canal extending to Pompeys Pillar. The Eastern and Fly Creek Divisions combine 4,085 acres of irrigable land. The Eastern Division utilizes the Main

1. U.S. Department of the Interior, Bureau of Reclamation. Huntley Project: *Annual Project History 1909*, vol 1, R.G. 115, Records of the Bureau of Reclamation, Project Histories, Huntley, 1909, Box 46, p. 1.(located in the National Archives, Denver, Colorado), Hereafter cited as R.G. 115, followed by box number, volume, year, and page number.

Canal and lateral system east of Pompeys Pillar. Lands south of Pompeys Pillar are included in the Fly Creek Division. Water is supplied by the High Line Canal and Reservoir Line Canal.

A storage reservoir was not required in the original project plans as the water supply at the canal headworks on the Yellowstone River was considered sufficient. Additional settlement and further development of project lands by local interests necessitated construction of a hold-over storage facility. The Anita Dam and Reservoir meets these demands. Water is supplied to the reservoir from the Yellowstone River by the High Line Canal. Stored water is used to supplement the supply from the hydraulic pump during times of heavy demand. Water is disbursed through the Reservoir Line Canal flowing across Fly Creek to Pompeys Pillar. The High Line Extension Canal diverts from the High Line Canal through a siphon crossing near the Anita Dam.²

Irrigable lands in the project slope towards the Yellowstone River. Water is delivered to the highest point on the farms for easy irrigation. Twelve and one-half inches of annual precipitation falls on the project, primarily in the spring and fall. Long, dry sunny days are the norm during the 131 day growing season.

The soil content of the valley ranges from light sandy to heavy clay, extending 10 to 15 inches deep. Approximately 5000 to 8000 acres near the lower end of the project are underlain with alkali as a result of the flatness of the area.³ Alkali in the soil made it difficult to produce a paying crop in these sections causing some friction between Reclamation and the irrigation district in the 1920's. The conflicts were resolved and a combined effort lead to further studies and irrigation on the alkali lands.

Historic Setting

Before development of the Huntley Project, there was no extensive settlement or private irrigation in the area. The earliest non-Indians were fur traders and prospectors who flocked to

2. U.S. Department of the Interior, Water and Power Resources Service, *Project Data*, (Denver: United States Government Printing Office, 1981), pp. 541-2.

3. R.G. 115, Box 46, vol. 1, 1909, p. 2.

the mountain streams in search of wealth.⁴ Hostility of the Sioux and Cheyenne prevented the development of private settlements and railroad construction.

In January of 1874 President Grant signed a bill establishing the Crow Indian Reservation. The reservation included the future site of the Huntley Project. Indian lands were not subject to the Homestead Act and could not be settled by white homesteaders and potential developers. While open lands along the Yellowstone River were cultivated, the lands on the reservation remained underdeveloped.⁵

Hunting was the main source of food for the Crow. Government efforts to teach the Crow farming techniques went for naught as the tribe preferred traditional ways. Agriculture was only practiced once the abundant buffalo population vanished in 1880. By 1895 the Crow became effective farmers and learned minor irrigation techniques. Farming was prevalent on the fertile lands of the reservation, but the dry lands along the river stayed unproductive.⁶

Successful farming in adjoining areas lead to considerable interest in the United States acquiring this arid area. Congress entered into an agreement with the Crow Tribe for acquisition of part of their reservation in early 1904. Under the terms of the contract the Crow would cede a strip of land in the northern part of the reservation for a payment of \$1,150,000.⁷ This legislation opened the ceded lands for homesteading and development. Surveys were undertaken to determine the feasibility of irrigation in the valley.

Project Authorization

On April 27, 1904 Congress approved surveys and investigations for reclamation of irrigable lands within the relinquished portion of the Crow Indian Reservation. Assistant Chief Reclamation Engineer Arthur P. Davis arrived in Billings in May to consider preliminary reports compiled by a team of engineers. Favorable results suggested it would be feasible to organize a government irrigation project and further surveys were ordered.⁸

4. *Ibid*, pp. 5-6.

5. *Ibid*, p. 7.

6. Dale K. McGinnis and Floyd W. Sharrock, *The Crow People*, (Phoenix: Indian Tribal Series, 1972), pp. 42-51.

7. R.G. 115, Box 46, vol. 1, 1909, pp. 7-8.

8. *Ibid*, p. 9.

Relying on the positive soil and environmental surveys compiled the previous year, on February 26, 1905, Reclamation's Board of Engineers declared the project workable. Investigations estimated the cost to construct a canal and distribution system at \$30 per acre, whereas improved lands across the river from the Huntley Project sold for \$100 per acre. An abundance of water, good climate and a local market area for produce were also in Huntleys favor.⁹

Secretary of the Interior E. A. Hitchcock authorized the construction of the Huntley Project on April 18, 1905.¹⁰ Reclamation planned to convert 35,000 acres of sagebrush lands into productive agricultural lands at a cost of \$900,000. Huntley became the fifth project undertaken by Reclamation to reclaim arid western lands.¹¹

Construction History

During early construction, the Huntley Project experienced problems common to Reclamation projects of the time. These were: contractor defaults; irrigation of lands with poor drainage capabilities; labor difficulties; and a pressing urgency to complete the project quickly as possible. These factors led to increased cost estimates and delays in completion of the work. Despite these problems, in 1907 the Huntley Project became the second Reclamation undertaking completed for water delivery.

Plans and specifications for the project were developed in the Denver offices of Reclamation with very limited data. Reclamation actually made final location decisions after completion of initial plans. Reclamation changed field locations on the basis of careful studies on soil conditions.¹²

Location of the Main Canal lead to adjustments to a Northern Pacific Railroad right of way. Reclamation planned the first two miles of the canal along the Huntley Bluffs adjacent to the Northern Pacific Railroad tracks. To avoid the railroad, Reclamation originally planned three

9. *Ibid*, pp. 3-4.

10. *Project Data*, p. 542.

11. Huntley Project History Committee, *Sod 'N Seed 'N Tumbleweed. A History of the Huntley Project Yellowstone County, Montana*, (Ballantine, Montana: Frontier Press), p. 9.

12. R.G. 115, Box 46, vol. 1, 1909, p. 13.

tunnels with an aggregated length of 1,515 feet. Then the railroad's future plans for another track at this location forced Reclamation to move further away from the tracks. These alterations resulted in lengthening the tunnels to a total of 2,650 feet.¹³

Reclamation set completion of the project for the 1907 irrigation season as a target date. Advertisements for contract work were rushed out in April of 1905. Bids were actually received and contracts let in advance of completion of engineering investigations. This proved unwise as most of the contracts were not executed and work had to be readvertised.¹⁴

Original plans for the Huntley Project called for the diversion of water from the Yellowstone River into a Main Canal three miles west of Huntley on the Yellowstone River. Diversion would be accomplished by the headworks of the canal. Sluiceways 2 miles below the headgates would regulate water in the canal. A channel from Pryor Creek, two miles downstream from the headworks, also supplied water to the Main Canal. The Yellowstone River Basin was 12,000 square miles. Water supply at the canal headworks on the Yellowstone River was deemed adequate for the project. Reclamation did not think a diversion dam or reservoir was necessary.¹⁵

Construction of the headworks, driving of the three tunnels and excavation of the Main Canal began in 1906. The headworks, completed in 1907, are made of reinforced concrete with two steel gates serving as the portal to Tunnel One. Tunnel One is 700 feet long, Tunnel Two 1,550 feet, and Tunnel Three 400 feet. All tunnels are lined with concrete, 9.2 feet wide, 9 feet high with arch roofs.¹⁶

Excavation of the Main Canal was divided into three divisions and completed by contract. Excavation tools, such as fresnos, slip scrapers, and wheel scrapers, were pulled by teams of horses to remove the coarse sand and gravel. A small deep cut just south of Huntley required excavation by a steam shovel.¹⁷ The canal is lined with reinforced concrete at creek

13. *Ibid*, pp. 14-5.

14. *Ibid*, p. 12.

15. R.G. 115, Box 49, vol. 9, 1950, p. 1.

16. U.S. Department of the Interior, Bureau of Reclamation. Huntley Project: *Annual Operation and Maintenance Report, 1910-1917*, vol. 6, R.G. 115, Records of the Bureau of Reclamation, Huntley, Box 46, 1916, p. 65.(located in National Archives, Denver, Colorado), Hereafter cited as R.G. 115, followed by box number, volume, year, and page number.

17. Huntley Project History Committee, p. 9.

crossings and other raised sections and earth lined in the remainder. Work on the Main Canal was targeted for completion by March 1, 1907.¹⁸

Division One excavation proved to be the most difficult. Construction of this section extended from the headworks for two miles to the Pryor Creek overpass, and it included driving the three tunnels. The contractors, Hughes and Olsen, sub-contracted the excavation and concrete lining of the tunnels. This proved costly to the contractors as all the sub-contractors experienced financial difficulty and defaulted on their contracts. Replacement of these contracts required extra time and resulted in delays. Work was finally completed in January of 1908.¹⁹

Standing water encountered during tunnel driving caused further delays for Hughes and Olsen. By June of 1906 very little work was accomplished on account of flooding from high waters. The contractors ill-prepared to deal with the excess waters and lining work was delayed until winter. Work on the tunnels continued until May of 1907.²⁰

Excavation of the Second and Third divisions was completed fairly easily. A contract was awarded to W. D. Lovell for open cut excavation of this work in 1906. The 6 ½ mile Second Division was completed in November of 1907.²¹ Included in the Third Division excavation was the remainder of the Main Canal and the High Line Canal. Work on this unit was completed on October 1, 1907.

The Main Canal crossed the original channel of Pryor Creek eight times. A concrete lined channel 1500 feet long was built through force account by April of 1907 to avoid potential trouble with the stream. The concrete lined channel carries the water over the main canal directly into the Yellowstone River, thereby cutting off between two and three miles of old channel.²²

The original hydraulic pumping plant was located at a reinforced concrete drop at mile thirteen of the main canal. A 35 foot drop in the canal was utilized to lift water 45 feet into the High Line Canal to irrigate 5,000 acres. Two-thirds of the 300 cubic-foot-per-second water

18. R.G. 115, Box 46, vol. 1, 1909, p. 35.
19. R.G. 115, Box 46, vol. 1, 1909, pp. 33-7.
20. *Ibid*, pp. 22-5.
21. *Ibid*, p. 38.
22. *Ibid*, pp. 38, 124-5.

capacity of the Main Canal at the pumps dropped through the turbines and developed sufficient hydraulic energy to lift the remaining one-third water to the High Line Canal. The pumps were two direct-connected vertical turbine-driven actuating 20 inch centrifugal pumps. After passing through the pumps, the water continued through the Main Canal. Construction of the plant was completed by force account.

The plant structures contained concrete inlet and outlet pipes. The pumps were furnished and installed by the Camden Iron Works in 1907. First testing was done in May of 1908 for the irrigation season.²³

About three and one-half miles east of the pumping plant there is a drop of 40.5 feet in the Main Canal. The structure consists of a reinforced concrete pipe 617.5 feet long with an inside diameter of 3 feet 3 inches. The pipe is designed to give a capacity allowing for sudden floods and possible future increases in demand for water. An inadequate amount of water is passed to generate a power supply. The velocity of the water is broken by a diffusion chamber at the outlet. Water is passed either to the canal or through a wasteway.²⁴ Construction was completed in 1908.

A siphon located at the crossing of the main canal at Fly Creek was built during this period. The siphon is buried and built of reinforced concrete. It is 119 feet long with an inside diameter of five inches.²⁵

The lateral and drainage system construction caused the most concerns in the early period of the project. Problems with wooden structures and unforeseen water-logging of land made the initial designs of Reclamation engineers obsolete.

Original concepts for the laterals system took into account the flatness of the land and the alkali content of the area. Reclamation decided to construct a lateral system to deliver water to the high point of each farm unit and to lay out a system of waste water ditches to prevent the lands from being water logged. To accomplish this, Reclamation estimated 165 miles of lateral

23. *Ibid*, pp. 127-8.

24. *Ibid*, p. 123a.

25. *Ibid*.

ditches and 65 miles of waste-water ditches were necessary.²⁶ What Reclamation plans did not foresee was poor maintenance by the water users which prevented proper operation of the system.

A bid from Piper Brothers Company was accepted for the construction of 268 miles of laterals and ditches on January 2, 1906. The contractor experienced labor difficulties. There was a shortage of labor in the area, and wages were high as a result. The failure of sub-contractors to execute their agreements coupled with labor strife to cause severe economic hardship on Piper Brothers. Reclamation assumed control of the contract in November of 1906 and completed the work by force account before October of 1907. Delays caused by severe winter weather also contributed to the increased cost of the project.²⁷

Excavation on laterals was done primarily with horses with slip scrapers and an elevated grading machine. Eighty miles of waste ditches had to be excavated in compact gravel, making excavation difficult. Most lateral structures were built of wood, and it soon became obvious these would eventually be replaced with more permanent structures. The alkali in the soil caused the wood to deteriorate faster than expected.²⁸

Water for irrigation was delivered to the three sections as the canal and lateral systems were extended and completed. Construction on the Pryor Division began in 1905 and was completed in 1908. The Eastern and Fly Creek Divisions were started in 1906. Water was available for irrigating the Eastern Division in 1914 and the Fly Creek Division in 1915.

The original estimate of construction costs for the project was \$900,000. Due to the problems and delays costs for the Huntley Project rose to \$1,600,000.²⁹ Increased costs led to larger repayment expenses for the farmers. Problems with repayment schedules hindered growth and development in the valley.

Once the main features of the Huntley Project were in place, a period of adjustment commenced. As the years went by: old structures wore out; inadequacies of the drainage system

26. *Ibid*, pp. 17-8.

27. *Ibid*, pp. 54-8.

28. Huntley Project History Committee, p. 10.

29. *Ibid*.

surfaced; and the need for a diversion dam and storage reservoir became apparent. The success of the Huntley Project depended on practical solutions to these problems. Cooperation between Reclamation and the irrigation district would provide the answers.

Post-Construction History

After initial development, Reclamation looked for ways to expand the irrigation area in the Huntley Project. Canal extensions and an auxiliary pumping plant were the solutions to increase the area serviced. The increasing problem of inadequate drainage was also addressed by Reclamation. The project's continued growth provided the impetus for the Irrigation District to build a diversion dam and reservoir for additional irrigation.

Canal Extensions

Increased irrigation in the Eastern and Fly Creek divisions led to extensions in the Main Canal and High Line Canal as well as construction of the Reservoir Line Canal. Construction of these systems occurred between 1914 and 1918.

Reclamation extended the Main Canal from mile 20 to its final length of 32 miles in 1914 and 1915. This opened an additional 1,815 acres of irrigable land east of Pompeys Pillar in the Eastern Division. Because the canal passes through pervious material in some locations, clay was used to line the canal, greatly reducing seepage.³⁰

Additional irrigation water for the Fly Creek Division came from building two new canals, the High Line Extension Canal and the Reservoir Line Canal. Both canals, constructed between 1915 and 1917, are concrete and earth lined. Eight miles below the pumping plant the High Line Canal was extended 4.4 miles to provide water to an additional 2,079 acres of land southwest of Pompeys Pillar.³¹ The 9.2 mile long Reservoir Line Canal also was constructed at the end of the High Line Canal to provide irrigation water to 2000 acres. A portion of the water from the High Line Canal is turned down a concrete chute into the new canal and travels through Fly Creek Valley on the west side. A siphon carries the water across Fly Creek and flumes provide carriage across Lost Boy Creek, Smith Creek, and Dry Coulee. Water was first available

30. R.G. 115, Box 47, vol. 6, 1915, pp. 9, 37.

31. R.G. 115, Box 47, vol. 6, 1916, pp. 2, 28.

in the High Line Canal Extension and the new Reservoir Line Canal for the 1916 irrigation season.³²

Even with these additions to the canal system, additional lands in the Fly Creek Division were available for irrigation but were not serviced by the existing system. Separate surveys done by Reclamation engineers in 1916 proposed four alternatives for an increased water supply.

The first proposal was the construction of a storage reservoir near Anita to supplement the capacity of the pumping plant. This proposal was declared infeasible by project manager R. H. Finfield for various reasons including: high cost of construction; insufficient capacity to meet estimated deficiency; and increased seepage resulting from the increase of waste-water.³³

Three alternatives to a storage reservoir were proposed later in 1916. Lining all of the canal system under the pumping plant was one possibility. This idea was rejected because water conservation would not be great enough. Another possibility was a new gravity canal. Surveys revealed this system involved difficult sidehill construction along with an long inverted siphon necessary to carry water below the free surface flow in the canal.³⁴ The third possibility provided a solution. It involved building an auxiliary pumping station on the main canal near the existing pumping plant. Expanding seven miles of the High Line Canal would increase the cubic-foot-per-second capacity from 60 to 100, creating an additional water supply. The auxiliary plant would supplement the main pumping plant in times of increased water demand.³⁵ Work on the improvements began in October 1917 and was completed the following year.

Enlargement of the High Line Canal involved replacing all wooden checks, drops and spillways with reinforced concrete structures. Excavation to widen the canal was done through private contractors and was completed in time for the 1918 season.

Construction on the pumping unit began in March of 1918. The plant was rushed into operation by July 1st in order to provide service for the upcoming irrigation season. Two 24 inch centrifugal pumps, powered by two 200 horsepower fuel oil engines, were installed by force

32. *Ibid*, pp. 27, 67.

33. R.G. 115, Box 47, vol. 5, 1916, pp. 41-2.

34. D. Doddiah, *Inverted Siphons as Canal Structures*, (Denver: Colorado University, 1949), p. 1.

35. *Ibid*.

account. Competent mechanical help was difficult to secure causing some delays in completion. Every available knowledgeable mechanic was secured, and the pumps were put into service on June 28.³⁶

Drainage

The designers of the Huntley Project calculated 80 miles of drainage ditches would be adequate to provide for discharge of storm waters and surplus irrigation waters. The distribution and drainage system proved to be poorly designed and major repairs and alterations were necessary by 1910. Wooden structures were replaced with permanent concrete, grouted paving, vitrified pipe structures. The cause of most of the deterioration was alkali in the soil and excess water. Replacements were made as soon as funds became available.³⁷

Seepage began to be a concern in 1910. The problem resulted because of water losses from the canals, excessive application of water to crops, and the neglect of irrigators in not providing proper drainage for waste-water. The underground drainage system was not adequate to pass the flow to a natural outlet. The sub-soil became saturated and lands began to be waterlogged. By 1913, 1000 acres in the Pryor Creek Division were waterlogged and 8000 acres were threatened.³⁸

Investigation began to gather facts relating to soil conditions, depth of soil and gravel, water bearing material and the water table. Borings were made every 1/8 mile through the project to obtain cross-section profiles. Based on the data, locations of needed underground drains were projected.³⁹

The underground drains were placed 7 to 8 feet below ground. The drains were placed to intercept the lateral flow of the underground water. Drains were made from gravel material and sheet piling was utilized in their placement. Pryor Division seepage problems were nearly eliminated by 1920. 50.5 miles of closed tile drains and 15.5 miles of open tile drains alleviated

36. R.G. 115, Box 48, vol. 7, 1918, pp. 31-7.

37. R.G. 115, Box 47, vol. 6, 1913, p. 38.

38. *Ibid*, p. 12.

39. R.G. 115, Box 47, vol. 6, 1914, pp. 22-3.

the waterlogging problem.⁴⁰

Drainage concerns spread to the Eastern Division and Fly Creek Division by 1920. Before this year the water-users made no attempt to secure any definite information regarding subsurface conditions. A petition submitted to the project office in 1919 requested Reclamation to provide the means for the necessary improved drainage. Deep drainage canals were needed to alleviate water buildup. Wasteway ditches not maintained by farmers were rapidly deteriorating in service quality. Tests were run on the lands but no funds were secured for the construction costs. In December of 1920 the water-users voted down a proposed construction contract with Reclamation.⁴¹

The formation of the Huntley Project Irrigation District in 1921 was a direct result of the failure of water-users to secure a construction contract with Reclamation for drainage improvements. A series of poor crop years left the district in financial straits and delinquent in annual repayment of construction costs. The delinquency was a stumbling block to future development. Water-users had no intention of cleaning wasteways themselves and insisted the work should be completed by Reclamation. On the other hand, the district refused to indicate how it would provide the funds. Reclamation would not appropriate any further maintenance funds without a repayment schedule. Until a settlement between the two parties was reached, no work could commence.⁴²

Relations between Reclamation and the irrigation district remained strained until 1927. However, a contract, dated January 2, 1927, ended the dispute. Under the terms of the agreement the district assumed responsibility for operation and maintenance of the project in 1928. They would also assume responsibility for the repayment of construction costs.⁴³ The roadblock to the Huntley Project's success had been removed.

Reclamation would not completely turn over the project until they felt their improvement work was fully completed. The contract provided for \$40,000 worth of additional repair work on

40. R.G. 115, Box 47, vol. 6, 1913, p. 12; R.G. 115, Box 48, vol. 7, 1920, p. 52.

41. R.G. 115, Box 48, vol. 7, 1920, pp. 50-1.

42. R.G. 115, Box 48, vol. 8, 1921, p. 63.

43. R.G. 115, Box 49, vol. 9, 1926, pp. 6-10.

the remainder of the Pryor Creek drainage system, and an additional \$20,000 for the construction of an underground drainage system in the Eastern Division and Fly Creek Division. The installed drainage systems are tile structures similar to Pryor Creek's. Excavation began in July of 1927 and work was completed the following spring.⁴⁴

Yellowstone River Diversion Dam

In 1931 low river flow caused the irrigation district to construct a temporary diversion dam on the south bank of the Yellowstone River. The diversion dam was an earthfill structure lying 1,000 feet downstream from the main canal headgate. A succession of dry years followed and the dam was repaired and used for each season up to and including 1933.⁴⁵ The irrigation district finally replaced the temporary earthfill dam with a permanent concrete weir in 1934. The Yellowstone River Diversion Dam is 10.5 feet high with a crest length of 325 feet.⁴⁶ A 6 foot diameter underground concrete pipe carries water to the canal. The dam makes diversion of water from the river possible during periods of low water.

The Yellowstone River Diversion Dam served well until 1956, when a crack caused by settlement of the concrete appeared. This damage resulted from extensive erosion of the streambed undercutting the dam's foundation. The Irrigation District repaired the dam under a \$100,000 rehabilitation and betterment loan negotiated with Reclamation on January 4, 1957. The repairs were completed in the fall of 1957.⁴⁷

Anita Dam and Reservoir

The Anita Dam and Reservoir was constructed to reduced operating time of the expensive auxiliary pumping plant. The reservoir has a storage capacity of 400 acre-feet. Water is lifted to the reservoir through the High Line Canal and hydraulic pumps during slack periods. The stored water is then used to supplement the water supply from the hydraulic pumps during

44. R.G. 115, Box 49, vol. 9, 1927, pp. 11-2.

45. R.G. 115, Box 49, vol. 9, 1950, p. 1.

46. U.S. Department of the Interior, Bureau of Reclamation, *Huntley Project: Annual Report, 1934*. R.G. no. 115, Records of the Bureau of Reclamation, Box 49, p. 1.

47. *Project Data*, p. 542; R.G. 115, Box 39, vol. 25, 1957, p. 3; U.S. Department of the Interior, Bureau of Reclamation, *Repayment of Reclamation Projects*, (Washington: United States Government Printing Office, 1972), p. 182.

periods of heavy demand. This keeps the operating time of the auxiliary plant to a minimum.⁴⁸

Work was completed by the Civilian Conservation Corps during 1936-1937. The dam consists of a rolled-earth embankment and is of the earthfill type. It stands 42 feet high with a crest length of 1,008 feet.⁴⁹ The dam and reservoir are located on the High Line Canal's 38 foot drop to the Reservoir Line Canal near Anita. Water is provided for the High Line Extension Canal and Reservoir Line Canal.⁵⁰

The reservoir is an important part of the highline distribution system because of the improved service it provides. In 1946 the original pumps were replaced by two pumps of similar design. The two turbo-pump units direct-connected on vertical shafts provide greater efficiency than the older units. The new pumps increased the maximum capacity from 75 to 100 cubic feet per second. These two pumps are semi-automatic and require only minimal supervision. The original diesel auxiliary pumps were replaced in 1975 by an 150-horsepower electric pump. The newer systems lift water into the High Line Canal more efficiently.⁵¹

In 1950 Reclamation selected the Huntley Project canal system for an experiment to test new types of linings. Evident seepage problems and easy access and excavation made Huntley one of the a suitable test sites.⁵² Emulsified asphalt, stabilized soil, burlap membrane, along with various widths of polyethylene plastic were tested for durability beginning in 1951. These studies helped Reclamation develop ways to reduce water loss in water systems.⁵³

Settlement of the Project

On May 21, 1907 President Theodore Roosevelt issued a declaration officially opening lands on the Huntley Project (Pryor Division) for settlement. Since the site had previously been part of the Crow Indian Reservation, no prior settlement had occurred. Reclamation studied resources and conditions affecting farmers in the nearby Yellowstone Valley and determined that

48. R.G. 115, Box 49, vol 9, 1950, p. 2.

49. Berg, Irving. "Civilian Construction Corps Constructs the Anita Dam, Huntley Project," *The Reclamation Era*, February 1938, pp. 38-9.

50. *Ibid.*

51. *Project Data*, p. 541; Branam, Bob. "Pumping for Prosperity." *The Reclamation Era*, November 1946, pp. 250-1.

52. R.G. 115, Box 49, vol. 25, 1952, p. 6.

53. R.G. 115, Box 49, vol. 27, 1954, p. 6.

a plot of 40 acres of irrigable land, including adjacent pasture land and woodland, was sufficient to support a family. The farm units therefore contained 40 to 160 acres of land. At the opening of the project 28,921 acres of land were opened for settlement totaling 585 farm units.⁵⁴

A 1905 survey by Reclamation engineer and soil expert Lewis E. Foster determined that 6,500 acres of land on the Huntley Project had an alkali content of over 1%. Reclamation decided to allow settlement on these lands providing the settler was informed of the soil content upon registration.⁵⁵

The District Land Office received 5,491 applications from prospective homesteaders before the closing date of June 25th. Secretary of the Interior James R. Garfield presided over a drawing to determine the order of preference in land selection. It turned out that many of the registrants were from Billings and applied only to see what number they would draw. These lottery fanatics had no intention of settling on the project. Many prospective settlers traveled great distances to register, only to find themselves far down the list. Most returned home thinking all the lands would be filed upon and they would have no chance of getting a farm. Of the first 1,000 names drawn only 76 completed filing.⁵⁶ On August 23, the registration list was exhausted and the lands were opened for unrestricted entry. As a result, settlement on the Huntley Project started slowly. Only 4,100 acres of land were cultivated in 1908. By 1910 the number of occupied farm units increased to 352 containing 20,905 acres, but only 12,000 acres were cultivated.⁵⁷

The costs per acre charges incurred by settlers for homesteading included: a \$30 construction charge to be paid in ten annual installments; a \$4 charge to the Crow Indian Reservation; 60 cents for first season operating costs; and \$3 to the construction charge. Land values increased from \$10 per acre to \$75 per acre after the irrigation systems were in place.⁵⁸

Townsites were planned close together to insure shipping facilities and supply points

54. R.G. 115, Box 46, vol. 1, 1909, pp. 154-5.

55. R.G. 115, Box 49, vol. 8, 1921, pp. 92-5, 140.

56. *Ibid*, p. 154; Huntley Project History Committee, p. 11.

57. *Ibid*, pp. 10, 154-5.

58. *Ibid*, pp. 156-7; Huntley Project History Committee, pp. 9,11.

close to farms. The government created towns at Huntley, Ballantine, Pompeys Pillar, and a few smaller locations. Lots were first opened in August of 1907 and the town's success fluctuated with the projects output.⁵⁹

Farmers experienced a period of slow and steady growth until 1918. The population of the farms on the project increased from 783 in 1908 to 2,107 in 1917.⁶⁰ Value of crops per acre increased from \$25 to \$36 in this same time span. The depression following World War I put great economic strains on the farmers from 1918 to 1924. This economic hardship hurt the relationship between Reclamation and the water-users.

In addition to the economic slump, farmers had to deal with a series of years with bad weather, high costs for labor and seed, and pests. These conditions made it difficult for farmers to meet financial obligations and many farms failed.⁶¹ The total value of crops decreased from \$948,968 in 1918 to \$572,696 in 1922. The population of the project also decreased to 1,015 by 1923.⁶² The economic strain on the project was reflected in overdue annual maintenance and construction fees and neglect of necessary routine repair work on the system.

Prior to 1921 the water users had no unified organization. Failure to secure funds for rehabilitation of the drainage system precipitated the creation of the Huntley Project Irrigation District. Reclamation and the District worked six years to settle a contract transferring operation and maintenance to the irrigation district. Three points of contention delayed negotiations: the question of alkali lands; the operation and maintenance deficit; and a proposed reduction of the annual construction charge in the Eastern and Fly Creek Divisions.⁶³

An agreement was finally reached in 1927. It stipulated the transfer to the district in January of 1928 of operation and maintenance as well as collections of annual charges. A reduced repayment schedule was also implemented along with provisions for repairs in the depleted drainage systems.⁶⁴

59. *Ibid.*, p. 175; R.G. 115, Box 47, vol. 6, 1911, p. 10.

60. R.G. 115, Box 47, vol. 5, 1917, p. 40.

61. R.G. 115, Box 48, vol. 8, 1921, p. 16.

62. R.G. 115, Box 48, vol. 7, 1918, p. 115; R.G. 115, Box 48, vol. 8, 1924, p. 63.

63. R.G. 115, Box 48, vol. 8, 1924, p. 11.

64. R.G. 115, Box 49, vol. 9, 1926, p. 6.

Financial recovery coincided with resolution of contract issues. A series of good crop years beginning in 1923 combined with increasing crop prices to establish a solid financial basis for the project.

Execution of the contract removed major problems in development and success of the project. Individual farm units grew in size as farmers who persevered through the troubled times acquired abandoned lands. The most profitable farms currently range from 100 to 160 acres in size.⁶⁵ At a ceremony commemorating the twenty-fifth anniversary of the project in 1932, Arthur P. Davis, one of the men responsible for authorizing the project, said, "those who have stayed established comfortable homes upon productive lands."⁶⁶

Once the farmers assumed responsibility for the project a spirit of independence and pride in the possession of facilities became evident in the valley. Prosperity led to the creation of the Yellowstone River Diversion Dam, Anita Reservoir and replacement of the old costly pumps with modern efficient models. The farmers assumed all costs for these upgrades and realized the resulting agricultural success.

Uses of Project Water

The water provided by the Huntley Project irrigation, distribution and storage systems is used chiefly for irrigation. A portion of the water does supply municipal needs in the towns of Huntley, Pompeys Pillar, Ballantine, and Worden.

Sugar beets and alfalfa have always been the primary crops grown in the valley. A need for intensified farming of specialized crops was a partial solution to economic hardships. A focused effort was made to increase cash crop, sugar beet and alfalfa, production during the depression following World War I.⁶⁷

Small grains and hay crops along with silage are also farmed on the project. The substantial silage crop serves as a stabilizing influence on the livestock industry in the area.⁶⁸

Conclusion

65. Huntley Project History Committee, p. 13; R.G. 115, Box 49, vol. 9, 1926, p. 18.

66. "Huntley Project Observes Twenty-Fifth Anniversary," *The Reclamation Era*, September 1932, p. 163.

67. R.G. 115, Box 48, vol. 8, 1922, p. 17.

68. *Project Data*, p. 544.

The story of the Huntley Project is one of perseverance and persistence. Problems with drainage designs, financial hardships and a sometimes negative relationship between Reclamation and the irrigation district were hurdles overcome by the project. A territory with fertile soil and easy water accessibility was transformed from a nonproductive area into a producer of alfalfa, sugar beets, silage, and grains. Reclamation realized the potential of the Huntley Valley and developed it into a fruitful area.

Bibliography

Manuscript and Archival Collections

Record Group 115, Records of Bureau of Reclamation
Project Histories, 1909, 1916-57.
Project Operation and Maintenance Reports, 1910-7.
Project Reports, 1934.

Government Documents

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

United States Department of the Interior, Bureau of Reclamation. *Repayment of Reclamation Projects*. Washington: United States Government Printing Office, 1972.

Articles

Berg, Irving. "Civilian Construction Corps Constructs the Anita Dam, Huntley Project." *The Reclamation Era*. (February 1938): 38-9.

Branam, Bob. "Pumping for Prosperity." *The Reclamation Era*. (November 1946): 250-1.

"Huntley Project Observes Twenty-Fifth Anniversary." *The Reclamation Era*. (September 1932): 162-3.

Books

Doddiah, D. *Inverted Siphons as Canal Structures*. Denver: Colorado University, 1949.

Huntley Project History Committee. *Sod 'N Seed 'N Tumbleweed. A History of the Huntley Project Yellowstone County, Montana*. Ballantine, Montana: Frontier Press, 1977.

McGinnis, Dale K. and Floyd W. Sharrock. *The Crow People*. Phoenix: Indian Tribal Series, 1972.

Index

Bureau of Reclamation	
assume control of construction contracts	9
fifth project authorized	5
initial investigations	5, 16
relationship with irrigation district	3, 13, 17
subsequent surveys	11
Camden Iron Works	8
Civilian Conservation Corps	15
Crow Nation	
agricultural efforts	4
contract with United States	4
creation of reservation	4
Davis, Arthur P.	4, 18
farming, Huntley Project	
alfalfa	18
grains	18
hay	18
livestock	18
silage	18
sugar beets	18
Finfield, R. H.	11
Foster, Lewis E.	16
Garfield, James R.	16
Grant, Ulysses (President)	4
Hitchcock, E. A.	5
Hughes and Olsen	7
Huntley Project	
alkali lands	3, 16
Anita Dam	3, 14, 15, 18
authorization	5
auxiliary pumping plant	2, 11, 15
canal lining experiments	15
change in original plans	5
cost estimates	5
drainage	8, 9, 12, 13
Eastern Division	2, 9
final construction cost	9
Fly Creek Division	2, 9-11
Fly Creek Siphon	8
High Line Canal	2, 3, 10, 11, 15
High Line Canal expansion	11
High Line Extension Canal	3, 10
irrigable acreage	2
irrigation plan	2, 3, 6
location	2
main canal	2, 6, 10
opening of project lands	16
Pryor Division	2, 9
pumping plant	2, 7, 8, 15
Reservoir Line Canal	3, 10
second drop	8

soil classification	3
sources of water	2, 6
Yellowstone River Diversion Dam	2, 14, 18
Huntley Project Irrigation District	
accomplishments	18
contract with Reclamation	13, 17
formation	13, 17
Lovell, W. D.	7
Montana	
Anita	3, 15
Billings	16
climate	3
early settlement	3
Huntley	2
Pompeys Pillar	2, 10
Piper Brothers Company	9
Roosevelt, Theodore (President)	15

