The Farwell Unit

Middle Loup Division

Pick-Sloan Missouri Basin Program

Wm. Joe Simonds
Bureau of Reclamation
1996

Table of Contents

The Farwell Unit 2
- Project Location 2
- Historic Setting 2
- Project Authorization 3
- Construction History 3
  - Sherman Dam 3
    - Investigations and Design 4
    - Construction 4
  - Arcadia Diversion Dam and Sherman Feeder Canal 7
  - Distribution Canals and Laterals 9
- Post Construction History 10
- Settlement of Project Lands 11
- Project Benefits and Uses of Project Water 12
- Conclusion 12

About the Author 12

Bibliography 13
- Archival Collections 13
- Government Documents 13
- Other Materials 13

Index 14

The Farwell Unit
Pick-Sloan Missouri Basin Program

Nebraska's most abundant natural resource is fertile land, and early settlers recognized that agriculture would become the region's major industry. But Nebraska is also a land frequently ravaged by re-occurring floods and severe drought. Crop failures brought about by these conditions threatened the livestock industry and created depressed economic conditions, focusing attention on the need to create a more stable agricultural base in the region. To accomplish this goal, control of the region's water resources would be key: control that came with initiation of the Missouri Basin Program and development of the Farwell Unit.

Project Location

The Farwell Unit is one unit of the Middle Loup Division of the Pick-Sloan Missouri Basin Program, the other unit being the Sargent Unit. The Farwell Unit covers portions of Custer, Sherman, Valley, and Howard Counties in central Nebraska. The bulk of project lands are located in Howard County between the North and Middle Loup Rivers, both tributaries of the Platte River. A small portion of the project lands are in Sherman County The closest major city is Grand Island, Nebraska, about 25 miles south-east of the project area.[1]

Sherman Dam is located on Oak Creek, about 4½ miles northeast of Loup City. Oak Creek is generally dry, having flows only following heavy rains. Water for Sherman Reservoir is diverted from the Middle Loup River at the Arcadia Diversion Dam and transported almost twenty miles to the reservoir site by the Sherman Feeder Canal. From Sherman Reservoir, water is transported to project lands via an extensive system of canals and laterals.[2]

Historic Setting

During the mid-1800s, through a series of treaties with several Indian tribes, much of the land in the Missouri River Basin was ceded to the United States. This action helped open the way for establishment of the Territory of Nebraska and its eventual admission into the Union in

---

1. United States Department of Interior, Bureau of Reclamation, *Technical Record of Design and Construction, Sherman Dam*, (Denver: U.S. Government Printing Office, 1964), 1-3; United States Department of Interior, Water and Power Resource Service, *Project Data*, (Denver: U.S. Government Printing Office, 1981), 841.
2. *Technical Record of Design and Construction*, 1; *Project Data*, 841.

1867. By 1870, settlement in the region had extended far up the Platte River and was beginning to move into the valleys of the North, Middle, and South Loup Rivers, north of the Platte. Howard County was established in 1871 and by 1890, most of the irrigable lands had been homesteaded. The population of Howard County continued to grow until 1920, when the population reached just over 10,700. Then drought, economic depression and advances in agricultural technology created an outward migration. By 1950, the population of Howard County had fallen to just over 7,200 people.[3]

Project Authorization

The Farwell Unit was originally authorized in the Flood Control Act of 1944 as part of the Pick-Sloan Missouri Basin Program, a comprehensive program to control and develop the waters of the Missouri River and its tributaries. Extensive investigations of the unit, conducted by the Bureau of Reclamation and completed in 1955, led to several changes and adjustments in the original plan which required reauthorization of the unit plan. The unit was reauthorized by Public Law 954 (84th Congress) on August 3, 1956.[4]

Construction History

The design of the proposed system called for diversion of water from the Middle Loup River at the Arcadia Diversion Dam, transport of that water to Sherman Reservoir via Sherman Feeder Canal, storage of diverted water in Sherman Reservoir, and distribution of water to project lands via a series of canals and laterals. In addition, one large and several small pumping plants would lift water to lands above the canal lines. Because the Middle Loup River carries a high concentration of silt, the headworks for the Sherman Feeder Canal was designed with a silt diverter to remove as much silt from the water as possible. In addition, a large sediment settling basin was included in the design of the Sherman Feeder Canal to remove additional sediment from the water before transporting it to Sherman Reservoir.[5]

Sherman Dam

3. *Technical Record of Design and Construction,* 1; *Project Data,* 843.
4. *Technical Record of Design and Construction,* 4; *Project Data,* 843.
5. *Technical Record of Design and Construction,* 3-4.

Investigations and Design

Reclamation conducted the first surveys for the location of a dam and reservoir on Oak Creek in 1947. During those investigations, a suitable site was located based on the topographical features of the area. Later investigations though, revealed a more suitable site about one-half mile downstream from the first site. Investigations at the chosen site included drilling 24 holes for foundation and water table studies, excavation of four test pits, and investigation of potential borrow areas. The studies revealed that the valley was covered by a thick blanket of loess, a wind-blown deposit of fine, sandy material that is common in the Missouri Basin. Laboratory tests on the foundation material showed the material to be unconsolidated but with a high load bearing capability when dry, but when saturated, it consolidated easily under fairly light loads. The original design for Sherman Dam called for a cut-off trench to be excavated to stable ground, but due to the depth of the loess, 45 to 80 feet, designers believed that the costs of excavation would be too high. Additional tests showed that when consolidated, the loess material would provide a suitable foundation. Reclamation engineers redesigned the dam, providing for pre-consolidation of the foundation by irrigation and loading. Sherman Dam is the first dam designed and constructed by Reclamation completely on a loessial foundation.[6]

Construction

Reclamation issued an invitation to bid on construction of Sherman Dam in July 1959. Nineteen bids were received with the lowest bid, $2,149,379, submitted by the J. A. Tobin Construction Company of Kansas City, Kansas. The contract was awarded to Tobin, who received the notice to proceed on August 20, 1959. The contract allowed 900 days for completion of the work.[7]

Because the specifications required that the foundation area be completely saturated and consolidated, the first construction operations focused on that task. Foundation watering was

---

6. *Technical Record of Design and Construction*, 5-6, 16; Douglas M. Considine, ed., *Van Nostrand's Scientific Encyclopedia*, Sixth Edition, Vol. II, (New York: Van Nostrand Reinhold Company, 1983), 1781.
7. *Technical Record of Design and Construction*, 69.

performed by Industrial Pipe Lines, Inc., a subcontractor for J. A. Tobin. Two wells, each about 1,000 feet deep, were drilled to supply water, and watering of the foundation area began on September 3, 1959. The foundation area was divided into sections ranging from 1 to 7 acres, and water applied at a rate of 70 to 100-gallons-per-minute per acre. After two weeks, test holes were drilled in the first section wetted to check the depth of penetration. These test revealed saturation to about 20-feet. Wetting was resumed, and tests were again conducted after 30-days. The second set of tests showed saturation to about 40-feet, and thereafter, watering was carried out continuously for 30-days, after which, testing was conducted to determine if additional watering was required. Industrial Pipe Line used 88,334,210 gallons of water, completing the final section on June 16, 1961.[8]

Stripping the foundation area began on October 7, 1959. Stripping operations followed closely behind wetting in order to prevent excess moisture loss, and only the top layer of material, about ½ to 1 foot, was removed. The specifications required that the first layer of embankment be placed within 8 hours of stripping to prevent loss of moisture through evaporation. The first embankment materials were placed on October 10. The embankment contains two zones, or types of material. The major portion of the embankment, zone 1, is loess material taken from near the dam site. The remaining portion, zone 2, consists of sand and gravel and is confined to a 5-foot layer in the downstream portion of the embankment. Zone 1 materials were spread over previous layers, moistened and compacted into 6-inch layers by sheepsfoot rollers. Zone 2 materials were placed in 12-inch layers and compacted by a crawler tractor. The moisture content of the embankment was closely monitored during construction. The final placement of embankment material took place on September 1, 1961.[9]

Excavations for the spillway and outlet works began on October 6, 1959. To provide a solid foundation for the outlet and spillway structures, it was necessary to excavate a trench to solid formation: about 50-feet. Suitable materials excavated from the trench were stored for use in the embankment, and unsuitable materials were wasted. Excavations were halted for the

8. *Ibid*, 74-5.
9. *Ibid*., 75-6, 79-85.

season in late November, and resumed April 9, 1960. On May 9, heavy rains caused high runoff on Oak Creek, and flooded the excavations, delaying construction. The contractor completed excavations in late July.[10]

Concrete operations began in August 1960. The first concrete was placed in the piezometer terminal well structure on August 4., with work on the well completed August 19. The first placement of concrete in the canal outlet works took place on September 2, with placement of the lower section of the gate chamber. The two 4-by 5-foot regulating gates and the 6-by 7½-foot high pressure emergency gate were supplied by the Hardie Tynes Manufacturing Company, and installed by the John W. Brown Construction Company. The steel pipe for the outlet works was fabricated by Thompson Pipe and Steel Company of Denver. The outlet pipe is made up of two sections. The first section, from the intake structure to the emergency gate chamber, has a diameter of 96-inches and is completely embedded in concrete. The second section, from the gate chamber to the downstream end of the outlet works, has a diameter of 90-inches. The downstream portion rests upon concrete supports inside a 12-foot diameter, horse-shoe shaped tunnel which provides access to the gate chamber. At the downstream end of the outlet conduit, a wye branch reduces the conduit into two 64-inch pipes which lead to the control house. To prevent leakage into the horseshoe tunnel, an asphaltic lining was placed over the completed structure prior to backfilling. A similar lining was used on the spillway conduit. Concrete placement in the spillway structure began in April 1961, and was completed in mid-September. Just over 3,850 cubic yards (c/y) of concrete and 688,400 pounds of reinforcement steel was used in the outlet works and spillway.[11]

Sherman Dam is a homogeneous earthfill structure with a maximum height of 134 feet and a crest length of 4,450 feet. The embankment contains 1,892,000 c/y of material and has a maximum base width of 610 feet from upstream toe to downstream toe. The outlet works consist of a drop style intake structure leading to a steel lined concrete conduit, a gate chamber with one emergency gate, a 12-foot diameter concrete tunnel containing a 90-inch diameter steel pipe

10. *Ibid*., 76.
11. *Ibid*., 55-8, 90-3.

leading to a control structure housing two canal regulating gates. The outlet works have a maximum capacity of 960 cubic feet-per-second (cfs). The spillway has an uncontrolled morning glory intake leading to a 8-foot diameter concrete conduit which discharges into a jump-type stilling basin. The maximum capacity of the spillway is 1,095 cfs. At maximum surface elevation, Sherman Reservoir holds 68,211 acre feet (af) and has a surface area of 2,845 acres.[12]

Arcadia Diversion Dam and Sherman Feeder Canal

The contract for construction of the Arcadia Diversion Dam, on the Middle Loup River about 8 miles northwest of Arcadia, Nebraska, was opened on July 8, 1960. The contract was awarded to the Bushman Construction Company on September 7, and the contractor was given the notice to proceed on September 12. The contract covered construction of the dam, the dam section of the Sherman Feeder Canal, about 1 mile, and the sediment settling basin. Site investigations were conducted by the contractor during the last months of 1960, but no work was undertaken on the dam itself. Bushman Construction sub-contracted excavations for the canal section and settling basin to the Wentz Construction Company, who began work on October 10, 1960. The primary contractor began work on the dam in early 1961. The river was confined to the east side of the river channel on April 17, and excavations and driving of the sheet metal piling for the western portion of the dam began on April 25. Concrete operations began with placements in the downstream cut-off wall in early May. On October 20, 1961, following completion of the west abutment and western portions of the dam, the river was diverted from the east side of the channel and through spillways of the completed portion of the dam. Concrete placement in the eastern portion of the dam began in mid-November. Installation of the first of twelve control gates, gate number 4, was completed on April 14, 1962, with installation of the remaining gate following soon after. All work on the dam and canal section was accepted as complete on November 6, 1962.[13]

---

12. *Ibid*., frontispiece, 41.
13. National Archives and Records Administration, Rocky Mountain Region, Records of the Bureau of Reclamation, Record Group 115, "Project Histories: Pick-Sloan Missouri Basin Program, Middle Loup Division: (continued...)

Arcadia Diversion Dam is a concrete ogee-weir with earthen embankments wings. The spillway section is 388.5 feet long and is controlled by twelve, 30- by 10-foot radial gates. The spillway as a capacity of 20,000 cfs. In addition to the twelve radial gates, there is one sluiceway to remove trapped sediment from behind the dam. It is controlled by a single 14- by 10-foot radial gate. The headworks for the Sherman Feeder Canal consist of two 20- by 7-foot radial gates. The diversion capacity of the dam is 850 cfs. The initial reach of the Sherman Feeder Canal is just over one mile long and has a sediment settling basin to trap sediment that enters the canal. Sediment is removed from the settling basin by dredge.[14]

Construction of the Sherman Feeder Canal was divided into two sections. The contract for Section 1 was awarded on August 25, 1960, to the Bushman Construction Company who submitted the low bid of $1,818,342. Bushman sub-contracted the earthwork to the Franke Construction Company and the Mosbarger & EMS Construction Company. The sub-contractors began excavations October 20, 1960. The first concrete in Section 1 was placed January 4, 1961, and all work under the contract was accepted as complete on November 30, 1962.[15]

The contract for Section 2 was also awarded to the Bushman Construction Company, who submitted the low bid of $1,682,721. The contract was awarded on October 10, 1960. As with Section 1, Bushman sub-contracted the earthwork, this time to the Wentz Construction Company, which began excavations on November 11, 1960. To transport water through the Middle Loup-Oak Creek Divide, it was necessary to construct a tunnel just over 2,000 feet long. Excavations for the tunnel portals began December 2, 1960, and were completed on February 13, 1961. Tunneling operations began on May 15, and continued until the tunnel was holed through on March 17, 1962. Concrete lining began on April 25, 1962. All work on Section 2 was completed and accepted on November 23, 1962. The first water was delivered to Sherman

---

13. (...continued)
Sargent and Farwell Units," 1960, Vol II, 19-20; 1961, Vol. III, Farwell unit, 16-7; 1962, Vol. IV, Farwell Unit, 18-23 (hereafter cited as "Project History" with year, volume number, unit name, and page).

14. United States Department of Interior, Bureau of Reclamation, Map No. 707-705-1040, "Missouri River Basin Project, Middle Loup Division, Farwell Unit," (US Government Printing Office, 1963); *Technical Record of Design and Construction*, frontispiece, 3.

15. "Project History," 1960, Vol. II, Farwell Unit, 20-1; 1962, Vol. IV, Farwell Unit, 18-23.

Reservoir through the Sherman Feeder Canal on November 9, 1962.[16]

The Sherman Feeder Canal is 19.1 miles long and has a capacity of 850 cfs. The Sherman Feeder Tunnel is 2,053 feet long with a diameter of 11.6 feet and a capacity of 850 cfs.[17]

Distribution Canals and Laterals

The Farwell distribution system consists of three primary and two secondary canals totaling over 114 miles, and more than 265 miles of laterals. The primary canals are the Farwell Main, Central, and South Canals. The secondary canals are the Lower Main Canal which is a branch of the Main Canal, and the Upper South Canal which branches from the South Canal. The lateral system is divided into five sections: the Main and Lower Main Laterals, served by the Main and Lower Main Canals; the Central Laterals, served by the Central Canal; and the South and Upper South Laterals, served by the South and Upper South Canals In addition to the canal and lateral system, there are 38 pumping plants. The largest plant, the Deer Station Pumping Plant, has four units with a total capacity of 27 cfs. The plant lifts water 106 feet to a distribution lateral. The smaller units lift water from 7 to 54 feet.[18]

Construction of the distribution system was divided into several sections, and contracts let for each. With the exception of the contract for section 2 of the Farwell Main Canal and the Lower Main Canal, all contracts were awarded to the Bushman Construction Company. The contract for the Farwell Main Canal, section 2, and the Lower Main Canal was awarded to the Turner Construction Company. The first contract for construction of the distribution system, for work on section 1 of the Main Canal and section 1 of the Central Canal, was awarded to Bushman Construction on February 20, 1961. As with previous contracts, Bushman Construction sub-contracted excavations and earthwork to other contractors. The three sub-contractors on the contract were the H&M Equipment Company, the B.O.C. Construction Company, and the Rolfmeier Construction Company. Work under the contract began on June 1,

16. *Ibid*., 1960, Vol. II, 21-2; 1961, Vol. III, Farwell Unit, 22; 1962, Vol. IV, Farwell Unit, 18-23; *Project Data*, 841.
17. *Project Data*, 841, 845.
18. *Ibid*., 843-5.

1961, and was accepted as complete on April 23, 1963.[19]

The contract for section 2 of the main Canal and the Lower main Canal was awarded to Turner Construction in March 1961. Sub-contracts were let for earthwork and supply and placement of concrete pipe. Siphons, drops, and other structure were constructed by the primary contractor. Work under the Contract began in late June, and the first concrete was placed in early July. Work under the contract was 83% complete by the end of 1962. Concrete work was completed in early September 1963, and all work under the contract was accepted as complete on October 30, 1963.[20]

The remaining contracts were awarded to Bushman Construction beginning January 19, 1962, with the final contract, for construction of the Main and Central Laterals, let in July 1965. Contract work on the Farwell distribution canals and laterals was completed in August 1966. The contract for construction of the Deer Station Pumping Plant was awarded to Bushman Construction Company in early 1964. Work under the contract began June 5 and was completed June 24, 1965.[21]

The Farwell Main and Lower Main Canals have a combined length of 37.5 miles and an initial capacity of 960 cfs. The Farwell Central Canal is 18.5 miles long with an initial capacity of 170 cfs. The Farwell South and Upper South Canals are a combined 39.7 miles long and have an initial capacity of 340 cfs. The Farwell Main and Lower Main Laterals total slightly more than 105 miles in length and have capacities that range from 60 cfs down to 4 cfs. The Farwell Central Lateral system totals more than 46 miles in length with capacities ranging from 30 cfs down to 4 cfs. The Farwell South and Upper South Lateral system is just under 103 miles long with a capacity that ranges from 30 cfs down to 4 cfs.[22]

Post Construction History

Although the entire distribution system was not completed until 1966, the first deliveries

---

19. "Project History," 1961, Vol. III, vii, Farwell Unit, 24-5; 1963, Vol. V, Farwell Unit, 20-1.
20. *Ibid*., 1961, Vol. III, Farwell Unit, 27-8; 1962, Vol. IV, Farwell Unit, 18-23; 1963, Vol. V, Farwell Unit, 20-1.
21. *Ibid*., 1962, Vol. IV, Farwell Unit, 18-24; 1963, Vol. V, Farwell Unit, 22-3; 1964, Vol. VI, x; Farwell Unit, 21; 1965, Vol. VII, x; Farwell Unit, 16-7; 1966, Vol. VIII, vii.
22. Map No. 707-705-1040, "Missouri River Basin Project, Middle Loup Division, Farwell Unit".

of water took place in June 1963, when water was delivered to 63 farm units for irrigation of 3,200 acres of project land. All features of the Farwell Unit were transferred to operation and maintenance on January 1, 1966. The operation and maintenance of the diversion, supply, and distribution facilities of the Farwell Unit is carried out by the Loup Basin Reclamation District under contract with the Bureau of Reclamation. Under a unique contractual arrangement, the Loup Basin Reclamation District supplies water to both the Farwell and Sargent Units through contracts with the Farwell and Sargent Irrigation Districts.[23]

Since its completion, the Farwell Unit has established an impressive record of success. Since submission of the Unit's first crop report in 1963, the Farwell Unit has posted cumulative crop values of over $273,500,000, placing it squarely among most successful units in the Pick-Sloan Program. All of the features of the unit have performed well, requiring only routine maintenance, and minor repairs and modifications.[24]

Settlement of Project Lands

Most of the lands within the Farwell Unit had been homesteaded and settled by the late 1800s, therefore, no project lands were withdrawn for future settlement. But the development of the Farwell Unit may have played an important role in maintaining settlement in the region. One of the goals of the promoters of the Farwell Unit was to halt the outward migration of people from the region. The population of Howard County peaked around 1920, when more than 10,000 people lived there. Drought and depression forced many to abandon the land and move to other areas. By 1950, the population had dropped to just over 7,200, and by 1960, even further, to just a little more than 6,500. Following completion of the Farwell Unit in the mid-1960s, the population of Howard County rose, reaching just over 6,800. By 1980, the population had declined slightly to about 6,770 people, and even further, to about 6,050, by 1990. Although the population of the region continues to decline, the outward migration appears to be somewhat

23. "Project History," 1966, Vol. VIII, xx; United States Department of Interior, Bureau of Reclamation, *Repayment of Reclamation Projects*, (Washington: U.S. Government Printing Office, 1972), 285.
24. United States Department of Interior, Bureau of Reclamation, *1992 Summary Statistics: Water, Land, and Related Data*, (Denver: US Government Printing Office, 1995), 58-9; Information on Sherman Dam modifications and repairs taken from "Safety of Existing Dams (SEED) Report, Sherman Dam," Information on file at Reclamation's Dam Safety Office, Denver, Colorado.

slower, a trend that could be partially attributed to the establishment of a stable agricultural base made possible by the development of the Farwell Unit.[25]

Project Benefits and Uses of Project Water

The largest benefit derived from project water is a stable supply for irrigation. In 1992, water was delivered for irrigation of just over 49,000 acres of project lands. The primary crop raised on project land is corn, covering more than 39,400 acres. Alfalfa and other forage crops cover another 3,800 acres, with soybeans and other field crops grown on the remaining acreage. In 1992, the value of crops grown on the Farwell Unit exceeded $13,700,000.

Recreation is another benefit of the Farwell Unit, with recreational activities available at both Sherman Reservoir and the Arcadia Diversion Dam. Popular activities include boating, camping, fishing, hunting, and sightseeing. Recreational activities at both locations are administered by the Nebraska Game and Parks Commission.[26]

The Farwell Unit provides only limited flood control benefits.

Conclusion

By all measures, the Farwell Unit is an outstanding success. By providing a stable supply of water for irrigation, the Unit allows the farmers in the region to take advantage of Nebraska's most prized natural resource: its land. The success of the Farwell Unit speaks not only to the value of the land, but also to the value of cooperation among area water users, irrigation and reclamation districts, and the Bureau of Reclamation. Cooperation that helped make the Unit one of the most successful units in the Pick-Sloan Missouri Basin Program.

About the Author

William Joe Simonds was born and raised in Colorado and has a clear understanding of the importance of water in the American West and its influence on the development of that region. He attended Colorado State University where he received a BA in History in 1992 and a Masters in Public History in 1995. He lives with his wife and two children in Fort Collins, Colorado.

---

25. *Technical Record of Design and Construction*, 1; United States Department of Commerce, Bureau of the Census, *County and City Data Book, 1983*, (Washington: U.S. Government Printing Office, 1983), 354; Courtenay M. Slater and George E. Hall, eds., *1992 County and City Extra*, (Lanham, MD: Bernan Press, 1992), 400-1.
26. *1992 Summary Statistics: Water, Land, and Related Data*, 72, 108, 114, 289.

Bibliography

Archival Collections

National Archives and Records Administration, Rocky Mountain Region. Records of the Bureau of Reclamation. Record Group 115. "Project Histories: Pick-Sloan Missouri Basin Program, Middle Loup Division: Sargent and Farwell Units" 1959-66.

Government Documents

United States Department of Commerce, Bureau of the Census. *County and City Data Book, 1983*. Washington: U.S. Government Printing Office, 1983.

United States Department of Interior, Bureau of Reclamation. Map No. 707-705-1040, "Missouri River Basin Project, Middle Loup Division, Farwell Unit." US Government Printing Office, 1963.

United States Department of Interior, Bureau of Reclamation. *1992 Summary Statistics: Water, Land, and Related Data*. Denver: US Government Printing Office, 1995.

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

United States Department of Interior, Bureau of Reclamation. *Technical Record of Design and Construction, Sherman Dam*. Denver: U.S. Government Printing Office, 1964.

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

Other Materials

Considine, Douglas M., ed. *Van Nostrand's Scientific Encyclopedia*, Sixth Edition, Vol. II. New York: Van Nostrand Reinhold Company, 1983.

Slater, Courtenay M. and George E. Hall, eds. *1992 County and City Extra*. Lanham, MD: Bernan Press, 1992.

Index

Arcadia Diversion Dam 2, 3, 7, 8, 12
B.O.C. Construction Company 9
Bureau of Reclamation 3, 4, 11, 12
Bushman Construction Company 7-10
Contractors: Arcadia Diversion Dam
    Bushman Construction Company 7
Contractors: Deer Station Pumping Plant
    Bushman Construction Company 10
Contractors: Farwell Distribution Canals and Laterals
    Bushman Construction Company 9, 10
    Turner Construction Company 9
Contractors: Sherman Dam
    J. A. Tobin Construction Company 4
Contractors: Sherman Dam-Control Gate Installation
    John W. Brown Construction Company 6
Contractors: Sherman Dam-Control Gates
    Hardie Tynes Manufacturing Company 6
Contractors: Sherman Dam-Outlet System Pipe
    Thompson Pipe and Steel Company 6
Contractors: Sherman Feeder Canal-Section 1
    Bushman Construction Company 8
Contractors: Sherman Feeder Canal-Section 2
    Bushman Construction Company 8
Contracts
    Arcadia Diversion Dam 7
    Deer Station Pumping Plant 10
    Distribution Canals and Laterals 9, 10
    Sherman Dam 4
    Sherman Feeder Canal-Section 1 8
    Sherman Feeder Canal-Section 2 8
Deer Station Pumping Plant 10
Farwell Central Canal 9, 10
Farwell Central Laterals 9, 10
Farwell Irrigation District 11
Farwell Lower Main Canal 9, 10
Farwell Lower Main Laterals 9, 10
Farwell Main Canal 9, 10
Farwell Main Laterals 9, 10
Farwell South Canal 9, 10
Farwell South Laterals 9, 10
Farwell Unit 2, 3, 11, 12
Farwell Upper South Canal 9, 10
Farwell Upper South Laterals 9, 10
Franke Construction Company 8
H&M Equipment Company 9
Hardie Tynes Manufacturing Company 6
Industrial Pipe Lines, Inc. 5
J. A. Tobin Construction Company 4
John W. Brown Construction Company 6
Legislation
    Flood Control Act of 1944 3

Public Law 84-954 (Aug. 3, 1956) 3
Loup Basin Reclamation District 11
Middle Loup Division 2
Middle Loup River 2, 3, 7
Missouri Basin 4
Missouri River 3
Missouri River Basin 2
Mosbarger & EMS Construction Company 8
Nebraska 2, 12
Custer County 2
Grand Island 2
Howard County 2, 3, 11
Loup City 2
Sherman County 2
Valley County 2
Nebraska Game and Parks Commission 12
Nebraska Territory 2
North Loup River 2, 3
Oak Creek 2
Pick-Sloan Missouri Basin Program 11, 12
Pick-Sloan Missouri Basin Program: Farwell Unit 2, 3, 11, 12
Arcadia Diversion Dam 2, 3, 7, 8, 12
Deer Station Pumping Plant 10
Farwell Central Canal 9, 10
Farwell Central Laterals 9, 10
Farwell Lower Main Canal 9, 10
Farwell Lower Main Laterals 9, 10
Farwell Main Canal 9, 10
Farwell Main Laterals 9, 10
Farwell South Canal 9, 10
Farwell South Laterals 9, 10
Farwell Upper South Canal 9, 10
Farwell Upper South Laterals 9, 10
Sherman Dam 2, 4, 6
Sherman Feeder Canal 3, 7-9
Sherman Reservoir 2, 3, 7, 8, 12
Pick-Sloan Missouri Basin Program: Middle Loup Division 2
Pick-Sloan Missouri Basin Program: Sargent Unit 2, 11
Platte River 2, 3
Rolfmeier Construction Company 9
Sargent Irrigation District 11
Sargent Unit 2, 11
Sherman Dam 2, 4, 6
Sherman Feeder Canal 2, 3, 7-9
Sherman Reservoir 2, 3, 7, 8, 12
South Loup River 3
Sub-Contractors: Arcadia Diversion Dam
Wentz Construction Company 7
Sub-Contractors: Distribution Canals and Laterals
B.O.C. Construction Company 9
H&M Equipment Company 9
Rolfmeier Construction Company 9
Sub-Contractors: Sherman Dam

Industrial Pipe Lines, Inc. 5
Sub-Contractors: Sherman Feeder Canal
Franke Construction Company 8
Mosbarger & EMS Construction Company 8
Wentz Construction Company 8
Thompson Pipe and Steel Company 6
Turner Construction Company 9
Wentz Construction Company 7