Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED FEB 10 1981
DATE ENTERED MAR 25 1981

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC ~~THE~~ NEWLANDS RECLAMATION ~~PROJECT~~ (TRUCKEE-CARSON PROJECT)
Thematic Resources

AND/OR COMMON
The Truckee-Carson Irrigation District (TCID)

2 LOCATION

STREET & NUMBER
The project area encompases a large area in west-central Nevada centered near Reno and a smaller area in north-eastern California within the Sierra Nevada range. (See enclosed map)

__NOT FOR PUBLICATION

CITY, TOWN Fallon X VICINITY OF Reno

CONGRESSIONAL DISTRICT Nevada-at-large

STATE California/Nevada CODE 04/32 COUNTY CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	X AGRICULTURE	__MUSEUM
X BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
__STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	X YES: RESTRICTED	X GOVERNMENT	__SCIENTIFIC
X Thematic	__BEING CONSIDERED	__YES: UNRESTRICTED	X INDUSTRIAL	__TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME Water & Power Resources Service - Mid-Pacific Region

STREET & NUMBER
Federal Building, 2800 Cottage Way

CITY, TOWN Sacramento __ VICINITY OF STATE California

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Churchill County Courthouse

STREET & NUMBER

CITY, TOWN Fallon STATE Nevada

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Nevada Historic Engineering Site Survey

DATE 3/25/79 __FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS History of Engineering Program. Texas Tech University

CITY, TOWN Lubbock STATE Texas 79409

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	__UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	X ALTERED	__MOVED DATE________
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The theme of this nomination is Conservation. The Newlands Reclamation Project, began in 1903, was among the first projects to be started as a result of National legislation passed to reclaim the arid lands of the west for agricultural uses. All the components of the project were designed to conserve water and then divert it for beneficial uses. The production and distribution of electrical energy is a beneficial by-product.

The Truckee River flows from Lake Tahoe east to Pyramid Lake while the Carson River flows out of the Sierra Nevada mountains and empties into the Carson Sink. Water made available from natural flow and storage in Lake Tahoe and Boca Reservoir is diverted from the Truckee River into the 32.5 mile Truckee Canal at Derby Diversion Dam about twenty miles east of Reno. Land along the canal receives some of the water, but most is discharged directly into the Carson River through the penstock of the Lahontan Powerplant or through a chute into the Lahontan Reservoir for storage or use on the lands of the Carson Division. Water released from Lahontan Reservoir is diverted into the T and V canals at the Carson River Diversion Dam and two minor diversion dams downstream and flows to the largest area of the project lands in the vicinity of Fallon.

Other features of the project are 69 miles of main canals, 312 miles of laterals and 345 miles of open drains. Full irrigation service is provided to almost 1,000 farms, a total of 73,000 acres. There are three electrical substations in operation and sixteen miles of transmission lines which serve the communities of Fernley, Wadsworth and Hazen as well as rural sections of the project. At Lahontan Reservoir there are beaches, boating facilities, fishing and campgrounds.

The Lake Tahoe Dam is a concrete control structure 14 feet high with 17 outlet gates. It regulates the elevation of the water surface of the lake and controls releases of irrigation water and water for power generation. It is located at the outlet of Lake Tahoe into the Truckee River in California

Detailed specifications are as follows:

LAKE TAHOE DAM

Type: Concrete slab-and-buttress sluiceway regulator.

Construction period: 1909-1913

Dimensions (feet):
- Height 14
- Crest length 109
- Crest elevation 6233.2
- Volume (cubic yards) .... 400.

Outlet works: Seventeen 5'by4' gates
- Capacity (cubic feet per second) 3,000

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	X CONSERVATION	__LAW	__SCIENCE
__1500-1599	X AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	__TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1903,1911,1915 BUILDER/ARCHITECT U.S. Bureau of Reclamation

STATEMENT OF SIGNIFICANCE

The Newlands Reclamation Project is of national historical significance because it was one of the first five projects authorized by the Director of the Reclamation Service under the Newlands Reclamation Act of 1902.

The project design was the result of investigations begun by the United States Geological Survey in 1889. When the United States Reclamation Service was organized, shortly after the National Reclamation Act of 1902, the Truckee-Carson Project was among the first five projects selected for construction. The Secretary of the Interior authorized the project on March 14, 1903, and construction began the same year. Project features shown in the accompanying drawings, include outlet works at Lake Tahoe; Derby Diversion Dam (placed in the National Register of Historic Places in 1978), Lahontan Dam Reservoir and Powerplant; Carson River Diversion Dam; 104 miles of main canals; 504 miles of laterals; and 335 miles of open drains. Most of the features are located in ancient Lake Lahontan which was named for Baron La Hontan, an early western explorer.

Lahontan Power plant was finished November 11, 1911. Using the fall from the Truckee Canal to the Carson River, the plant supplied electric power for most of the construction of Lahontan Dam (begun in January 1911). Electric motors powered the main borrowpit shovel, a dragline excavator, a 925 foot belt conveyor to transport gravel and soil to the main embankment, the sand-cement batching plant, a 1,600 foot cableway for transporting concrete, and numerous pumps, blowers, drills and conveyors. According to the project manager, D. W. Cole, "probably the first electric shovel was employed on this work and handled the 500,000 cubic yards of gravel at a cost very much below what a steam shovel would have shown at the local prices for coal" (Engineering News, vol. 73, April 22, 1915, p. 760). The electrical machinery proved highly effective and dam construction was completed in June 1915.

The original scope of the Truckee-Carson Project included irrigation of over 400,000 acres. The Omnibus Adjustment Act of 1926 contained a provision that reduced the project scope considerably. In recent years about 70,000 acres have been under irrigation of which 60,000 to 65,000 acres are under irrigation at any one time.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Cole, D.W. "Lahontan Dam, Truckee-Carson Irrigation Project, Nevada." Engineering News, Vol. 16, No. 16 (April 22, 1915), pp. 758-62.

Hardman, George and Howard G. Mason. The Irrigated Lands of Nevada. The University of Nevada Agricultural Experiment Station Bulletin No. 183. Reno: University of Nevada 1949.

UTM NOT VERIFIED

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 228.59 Ac+ excluding canals ACREAGE NOT VERIFIED

UTM REFERENCES (see supplemental sheet attached)

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A				B			
C				D			

VERBAL BOUNDARY DESCRIPTION

(see supplemental sheets attached)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
Nevada	32	Churchill Lyon Storey, Washoe	001 019 029,031
California	04	Nevada Placer	057 061

11 FORM PREPARED BY

NAME / TITLE Wilbur E. Wieprecht, Historian, Nevada HP&A in cooperation with Wendell Bell, Research Assoc. & Donald Abbe, Research Assist.

ORGANIZATION History of Engineering Program — DATE May 1980

STREET & NUMBER Texas Tech University, P.O. Box 4089 — TELEPHONE (806) 742-3591

CITY OR TOWN Lubbock — STATE Texas

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE Mimi Rodden

TITLE Administrator SHPO — DATE 23 July 1980

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE 3/25/81

for DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: Patrick Andrus (accept all but those returned - see comment sheet) DATE 3/25/81

for KEEPER OF THE NATIONAL REGISTER

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Boca Dam is located on the Little Truckee River within one mile above its junction with the Truckee River and approximately seven miles east of Truckee, California. It stores water primarily for the Truckee Storage Project around Reno and also for the Newlands Project.

Detailed specifications are as follows:

BOCA DAM

Type: Zoned earthfill

Construction period: 1937-1939

Dimensions (feet):
Height 100
Crest length .... 1,629.
Crest elevation 5,612.0
Volume (cubic yeards) 912,000.0

Spillway:
Width (feet) 40
Discharge capacity (cubic feet per second) 8,000

Outlet Works:
Concrete-lined tunnel in right abutment to two 4x4 slide gates in the gate chamber; thence two plate steel outlet pipes, controlled by two 42-inch needle valves.
Maximum discharge capacity (cubic feet per second) 900

The Derby Diversion Dam is located on the Truckee River 20 miles east of Reno. It is a concrete dam with an earthen embankment wing. This 31 foot high dam diverts river waters into the Truckee Canal.

As an entrant on the National Register, we recommend that it be made a part of this nomination.

LAHONTAN DAM is an earthen dam 120' high with an overall length of 5,400 feet. The main embankment, built in the bed of the Carson River, has a crest length of approximately 1,300 feet including an overflow spillway crest 250 feet in length at each end. The spillways step down with the terrain, curve and converge on a circular spillway pool 220 feet in diameter. An earthen wing dam or dike about 4 feet high, level with the top of the principal dam, extends southward for three-quarters of a mile (see attached Bureau of Reclamation drawings). The cross section of the dam has a top width of 20 feet and a maximum base width of 660 feet. The upstream slope is 3 to 1 while the downstream slope is 2 to 1 broken 12 feet above the spillway pool wall by a circular berm 10 feet in width. The 12-foot roadway at the top of the dam is carried across each spillway by means of five-span continuous reinforced concrete arches with 50-foot spans and 5-foot rises. A concrete railing guards the roadway and carries electric wire conduits for lighting the dam, gatehouse and roadway.

The outlet tower is a massive reinforced concrete structure in which are set 12 gates at two different elevations. Water from Lahontan Reservoir, which has an active capacity of 295,000 acre-feet, is let into the central chambers for discharge into the spillway pool via a 9-foot diameter conduit controlled by a hydraulically balanced cylindrical valve at the bottom of the tower. A 6-foot 6-inch diameter steel penstock, also controlled by a cylindrical valve, carries water to the power plant. A concrete penstock and separate outlet at the left or north side of the dam was abandoned in 1924. All of the gates in the tower are controlled by hydraulic oil pressure provided by an electrically operated pump. Access to the gatehouse is by means of a suspension footbridge extending from the top of the dam.

The powerhouse is a rectangular stone and concrete structure containing three generators with a combined capacity of 1,920 kilowatts. The fall from the Truckee Canal, which terminates at Lahontan Dam, was first utilized for hydro-electric generation at the powerhouse. This installation provided power for much of the dam construction (1911-1915). Since completion of the dam, the turbines driving the generators have been supplied by means of the steel penstock from the outlet tower in addition to the penstock from the Truckee Canal. The power plant continues to supply electric power to the surrounding area.

The Lahontan Dam and powerplant retains it original appearance, having undergone only minor modifications since its construction.

The <u>Carson River Diversion Dam</u> is a low concrete gate structure built in 1904 and 1905, to divert water into the canal system used to irrigate the farms in the Newlands Projects. Located on the Carson River five miles northeast of Lahontan Dam, this diversion dam performs a vital water distribution function for hundreds of farms in the Newlands Project.

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Detailed specifications are as follows:

CARSON RIVER DIVERSION DAM

Type: Concrete gate structure

Construction period: 1904-1905

Dimensions (feet):
Height 21
Crest length 241
Crest elevation 4044.75
Volume (cubic yards) 2,700

Spillway: Twenty-one 5 by 10 foot double leaf slide gates and one 15 by 10 foot gate.
Capacity (cubic feet per second) ... 30,000

Headworks: Three double leaf rising weir gates, each 5 by 15 feet, for V Canal heading (commonly used as underflow gates). Two wood slide gates 7 by 5 feet for T Canal heading.
V Canal capacity (c.u. ft. per second) 1,500
T Canal " " " " 450
See attached Bureau of Reclamation drawings.

Carriage Facilities

These principal canals carry waters from the Truckee and Carson Rivers to the storage, power, and diversion works described previously. A description of these facilities will round out an account of the main engineering works in the Newlands Project. Beyond the works described, there are many lesser dams, storage facilities, canals, drains, auxiliary power plants, and feeder systems to the agricultural land being utilized.

The Truckee Canal serves to carry waters from the Truckee River, diverted at Derby Dam, for thirty one miles to the Lahontan Dam.

Detailed specifications are as follows:

TRUCKEE CANAL

Type: Both concrete and earth lined.

Construction period: 1903-1906
Length (miles) 31
Diversion capacity (cubic feet per second) 1,500

Typical maximum section in earth:

Bottom width (feet)	20.0
Side slopes	1 1/2:1
Water depth (feet)	13.0

Typical maximum section, concrete-lined:

Bottom width (feet)	20.4
Side slopes	1/2:1
Water depth (feet)	13.0
Usual maximum flow (cubic feet per second)	1,000

The V Canal carries waters from both the Truckee and Carson Rivers east from the Carson River Diversion Dam south of the Carson River to the vicinity of Fallon, Nevada.

Detailed specifications are as follows:

V CANAL

Type: Earth

Construction period: 1904-1905

Length (miles)	26
Diversion capacity (cu. ft. per second) ..	1,500

Typical maximum section in earth:

Bottom width (feet)	22
Side slopes	2:1
Water depth (feet)	12
Usual maximum flow (cu. ft. per second) ..	

The T Canal carries waters east from the Carson River Diversion Dam north of the Carson River to the vicinity of Fallon.

Detailed specifications are as follows:

T CANAL

Type: Earth

Construction period: 1904-1905

Length (miles)	9
Diversion (cu. ft. per second)	450

Typical maximum section in earth:

Bottom width (feet)	10

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T Canal (continued

Side slopes 2:1
Water depth (feet) 6
Usual maximum flow (cu. ft. per second)

The "V" Canal Powerplant is a rectangular poured concrete structure, an approximate size 40'x60' feet. It is located at a 26 foot drop in the canal, six miles west of Fallon, Nevada. The unit was built by the Truckee-Carson Irrigation District and is operated by the Sierra Pacific Power Company of Reno. Output is fed into the power company's system.

Detailed specifications are as follows:

"V" CANAL POWERPLANT (constructed by TCID)

Year of initial operation: 1955

Year last generator placed into operations: 1955

Name plate capacity (kilowatts):
Existing 800
Ultimate 1,600

Number and name plate capacity of generators
(kilowatts): 800

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The Truckee-Carson Project was renamed in 1919 in honor of the late Nevada Senator Francis G. Newlands who was instrumental in promoting the passage of the National Reclamation Act of 1902. The operating agency which assumed control in 1926 is named the Truckee-Carson Irrigation District. Several disputes over water appropriations have arisen, but the technical feasibility of most of this significant project is unquestioned.

In a state with extremely limited agricultural resources, the Newlands Project has assured the production of crops and livestock on what was once desert. Besides assuring pasture lands, crops raised include alfalfa, barley, wheat, vegetables and small fruits. It is significant to Nevada for its conversion of waste lands to productive lands.

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CONTINUATION SHEET Bibliography ITEM NUMBER 9 PAGE 2

Headly, F.B. and Cruz Venstrom. Economic History of the Newlands Project. The University of Nevada Agricultural Experiment Station Bulletin Np. 120. Reno: University of Nevada, 1930.

Little, H.Clay. The Truckee's Agricultural Value. College of Agriculture Bulletin No. 3. Reno: University of Nevada, 1965.

Miller, Meredith R., George Hardman and Howard G. Mason. Irrigation Waters of Nevada. The University of Nevada Agricultural Experiment Station Bulletin No. 187. Reno: University of Nevada, 1953.

Townley, John M. Turn This Water Into Gold. Reno: Nevada Historical Society, 1977.

U.S. Bureau of Reclamation. Reclamation Project Data. Washington: Government Printing Office, 1961.

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UTM References:

Lake Tahoe Dam - 10/746760/4339000

Boca Dam - 10/750340/4363940

Derby Diversion Dam - 11/189850/4384700

Lahontan Dam & Powerplant - A. 11/321950/4370000
B. 11/322750/4370250
C. 11/322400/4369500

Carson River Diversion Dam - 11/328100/4373650

V-Canal Powerplant - 11/336450/4372150

Verbal Boundary Descriptions

Lake Tahoe Dam - The proposed boundary includes the area within a 55' radius from the center of the dam. 0.10 acres

Boca Dam - The proposed boundary includes that area within a 1055' radius from the center of the dam. 80.04 acres

Derby Diversion Dam (on National Register) - The proposed boundary includes that area with a 150' radius from the intersection of the two concrete structures that form the dam proper. 0.52 acres

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CONTINUATION SHEET Geographical ITEM NUMBER 10 PAGE 3

Lahontan Dam and Powerplant - The nominated property includes the dam and powerplant structures within the area delineated on the accompanying map beginning at Point A 1,000 feet west-southwest of the intersection of the service road and road across the dam to Point B 300 feet northwest of the powerhouse to Point C 350 feet southwest of the intersection of the service road at the other end of the dam. 68.87 acres

Carson River Diversion Dam - The proposed boundary of the nominated property includes the area within a 130 foot radius from the center of the dam. 1.35 acres

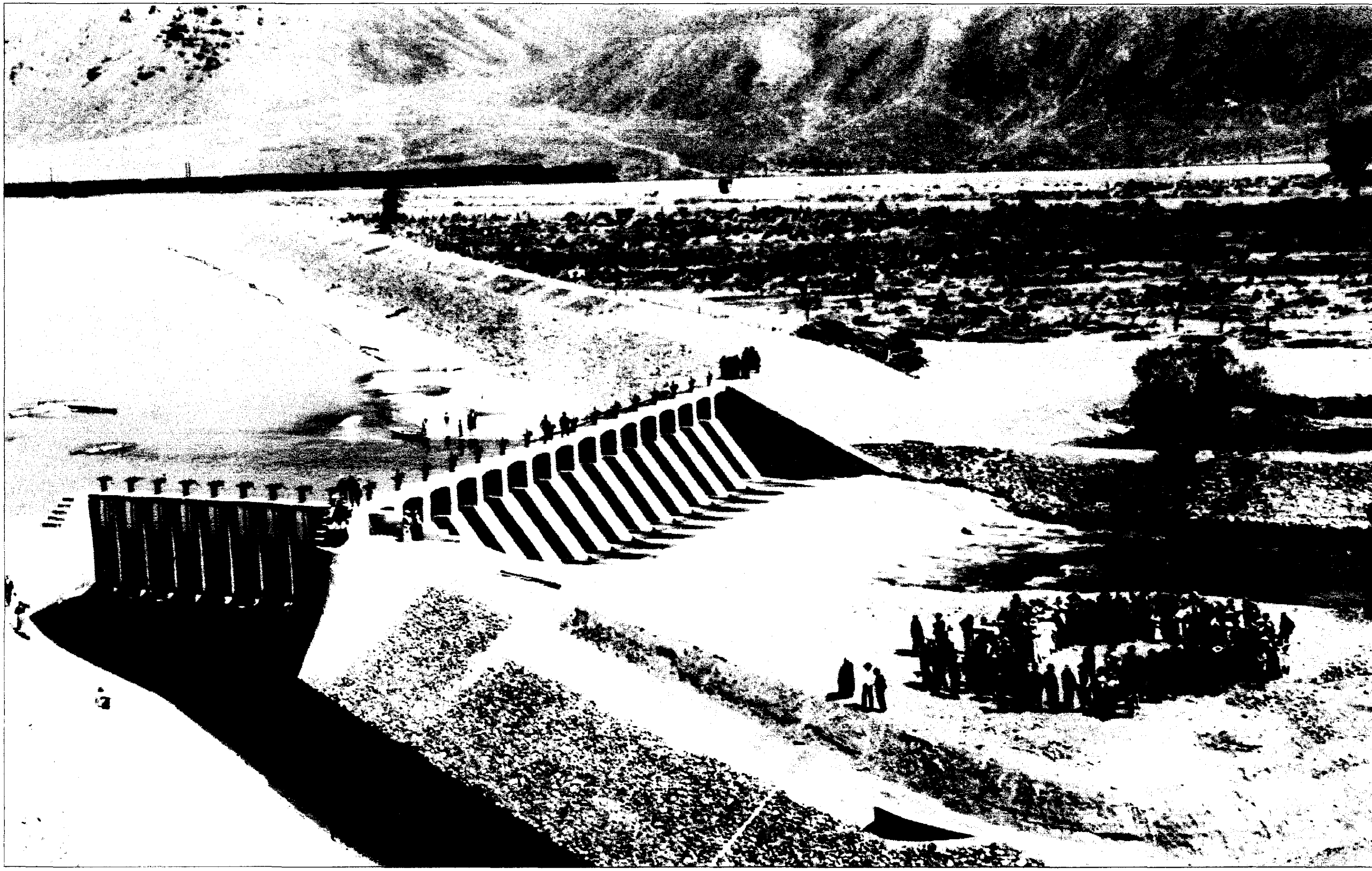
V-Canal Powerplant - The proposed boundary of the nominated property extends 30' from all sides of the powerplant. 0.31 acre

EVALUATING THE NATIONAL REGISTER ELIGIBILITY OF CULTURAL RESOURCES IN THE NEWLANDS PROJECT, NEVADA

Donald L. Hardesty and Larry Buhr
University of Nevada, Reno

Report Prepared for the United States Department of Interior, Bureau of Reclamation, Mid-Pacific Region, Sacramento, California. In Partial Fulfillment of Agreement 98-FC-20-17430

July 23, 2001



Congressional party and spectators gather at base of right abutment during the dedication of Derby Dam on June 17, 1905.

INTRODUCTION

This report intends to clarify elements of the Newlands Project that do and do not contribute to the Newlands Project National Register District (District). The need for clarification arises from the ambiguity of the original 1978 National Register nomination that has made management of the district difficult. Whatever its other historical values, the Newlands Project District first and foremost marks the importance of the federal government in promoting settlement of the American West through the development of irrigation agriculture. The Newlands Project is one of the earliest large-scale engineering schemes designed to achieve this federal goal. This report, therefore, focuses upon key components of the irrigation system (e.g., dams, canals, drains, and laterals) constructed by the federal government that are essential to the water storage and delivery system. For this purpose, the direct involvement of the federal government ends in 1926, when it transferred the operation and maintenance of the Newlands Project to the Truckee-Carson Irrigation District (TCID). The report considers only those components of the Newlands Project that either are owned by the Bureau of Reclamation (Reclamation) or for which Reclamation holds a right-of-way. It does not include components of the irrigation system such as privately owned farms and associated structures (e.g., ditches and laterals) that fall outside of Reclamation's legal authority. The report also does not consider historic landscapes in the District for much the same reason. Certainly irrigation transformed the area of the Newlands Project into a historic agricultural landscape; however, the key landscape elements are privately owned farms that fall outside the Bureau's legal jurisdiction. Finally, the report excludes from consideration the 1807 structures constructed by the Civilian Conservation Corps (CCC) between 1935 and 1942 (Pfaff 1999). The CCC involvement in the Newlands Project intended to put people to work during an economic depression rather than to develop irrigation farming in the region. For this reason, the CCC structures, while significant in their own right, are ~~considered~~ to fall outside the theme of the Newlands Project National Register District.

even though not going to nominate, document them in the historic context - property type?

DESCRIPTION

extend context to include CCC to 1942 close of the camp

In 1902, the United States Congress passed the Reclamation Act to bring arid lands of the American West into agricultural production. Construction of the Newlands Project (originally known as the Truckee-Carson Project) began in 1903 as one of the first five projects of the United States Reclamation Service (Reclamation Service) authorized under the Act.

Most of the Newlands Project encompasses the lower drainage basins of the Carson River, which flows east out of the Carson Range of the Sierra Nevada Mountains and empties into the Carson Sink, and the Truckee River, which flows from Lake Tahoe east to Pyramid Lake, in western Nevada. The project consists of a network of water control structures and associated properties that not only stores and distributes water for irrigating almost 73,000 acres of farmland but also generates hydroelectric power and controls flooding. Project features include water storage and diversion structures, water conveyance structures, power plants, and pumping stations.

On the Truckee River, Lake Tahoe Dam impounds and regulates upstream water flow. Further downstream near Fernley, Nevada, Derby Dam diverts water from the Truckee River into the Truckee Canal, which carries it 32 miles to Lahontan Reservoir on the Carson River and also

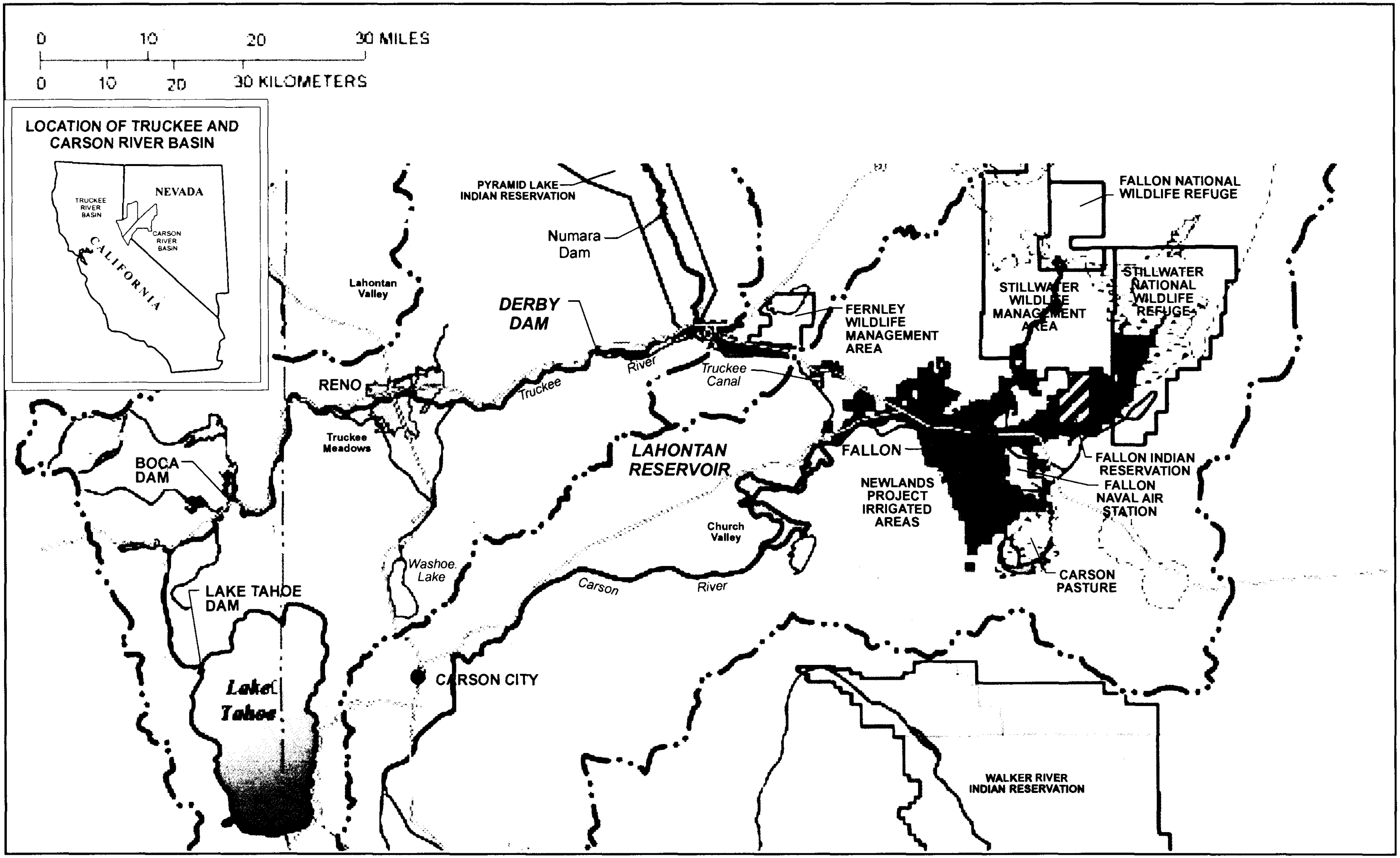


Figure 1. Regional location of the Newlands Project and adjacent areas. Map based on U.S. geological Survey digital data, 1:100,000.

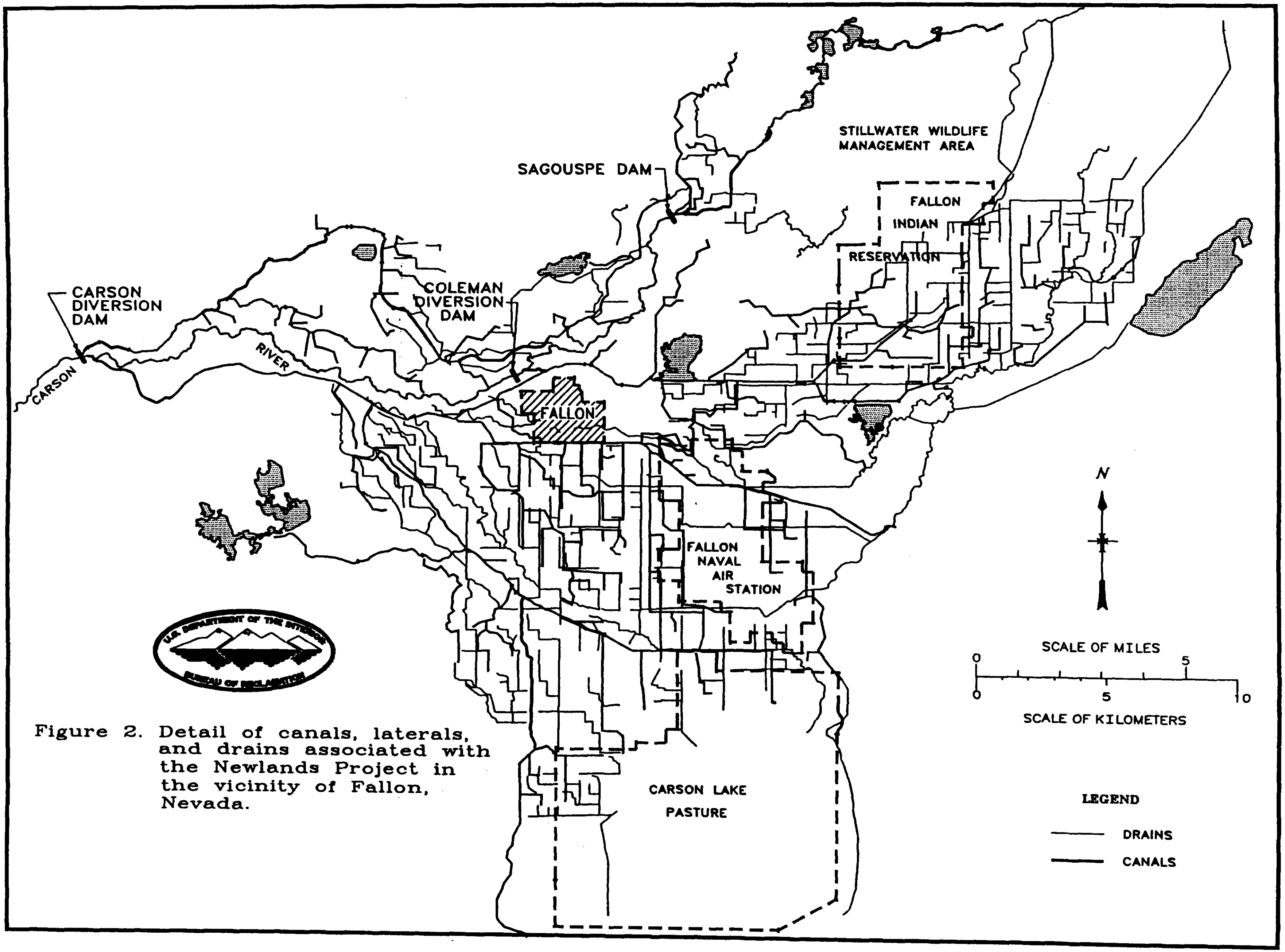


Figure 2. Detail of canals, laterals, and drains associated with the Newlands Project in the vicinity of Fallon, Nevada.

irrigates farmland in the vicinity of Fernley. On the Carson River, the Carson Dam diverts water from the Carson River into the south distributing "V" canal and into the north distributing "T" canal, both of which transport water to farmlands in the Lahontan Valley around Fallon, Nevada. Lahontan Dam impounds and regulates water flow on the Carson River just above Carson Dam. The Newlands Project also includes a network of drains that carry excess irrigation water away from the farmlands into drainage sumps such as Carson Lake Pasture.

Condition

The Reclamation Service built the core structures of the Newlands Project between 1903 and 1915. Much of the drainage system, however, was constructed between 1921 and 1928. Other minor structures such as small dams, drains, lateral canals, small power plants, and small reservoirs were added later, and continue to be added, to the project. The condition of the Newlands Project today reflects its history as an ongoing dynamic system with many components that have been replaced, remodeled, or repaired ~~over the years.~~ For this reason, most canals no longer have original linings, dams no longer have original gates or needle valves, and power plants no longer have original turbines. The late twentieth century saw the setting of the Newlands Project area change from rural farming to urbanism and a military training facility. At the same time, the original configuration, workmanship, materials, use, and character of the Newlands Project have not changed significantly and still very much convey their historic associations and period of significance. The Project also retains integrity of location and the general character of its original setting, along with feeling and association.

reg. requirements
→ integrity in ↓

Existing Legal Status

The National Register currently lists nine historic structures associated with the Newlands Project. They include Derby Diversion Dam (Truckee River Diversion Dam), listed in 1978 as a separate structure, and four other structures listed in 1981 as thematic resources of the Newlands Reclamation (Truckee-Carson) Project: Boca Dam, Lake Tahoe Dam, Carson River Diversion Dam, and Lahontan Dam and Power Station. Boca Dam, however, was constructed between 1937 and 1939 as part of the Truckee Water Storage Project and, therefore, is not part of the Newlands Project. The nomination also identified several other structures as thematic resources. They include the Truckee Canal, the T-Canal, the V-Canal, and the V-Canal Power plant (see Federal Register February 24, 1981). The National Register listed none of the "other features" in the nomination (e.g., smaller canals, laterals, and drains) for lack of necessary information.

HISTORIC CONTEXT

→ what are the other 5 – compare Newlands to these

The historical importance of the Newlands Project lies in its association with the first federal effort to develop arid lands in the American West for agricultural purposes. It is one of the first five federal reclamation projects authorized by the Director of the Reclamation Service under the Reclamation Act of 1902 (Townley 1998: 22). The Reclamation Act authorized the U.S. Department of the Interior to reserve public lands for farmers in the arid West and to construct water storage and conveyance facilities for using and conserving water under the direction of the Secretary of the Interior (Rowley 1996: xi). Economic development of the American West in the twentieth century depended upon the provisions of the act. The Reclamation Service implemented the provisions of the act by working to create new irrigated farmlands in the desert West that could be homesteaded. The Newlands Project encouraged farmers to homestead irrigated lands in the Lahontan Valley. From an engineering perspective, the Newlands Project is not dramatic or extraordinary. Certainly it pales in comparison to later reclamation projects in the American West such as the Hoover Dam or the Colorado Big-Thompson Project. Most of the water conveyance structures in the project, for example, are simple ditches, and the water diversion and storage structures have a very basic water engineering design.

Background

The Newlands Project is strongly associated with in the expansion of the United States into the arid lands of the American West. Archaeological evidence suggests that Native Americans lived in the area of the Carson River and Truckee River drainages for at least 11,000 years (Elston 1986). European American forays into the region began with the explorations of Peter Skene Ogden of the Hudson Bay Company in 1828. The Bidwell-Bartleson Party opened the California Trail through the region in 1841. In 1859, the discovery of the Comstock Lode first attracted large numbers of emigrants to the region and brought about Nevada's earliest urban settlement at Virginia City. Completion of the Central Pacific Railroad through the region in 1868 encouraged even more settlement. Precious metals mining dominated the economy of the region and the state of Nevada in the 1860s and 1870s. Ranching and farming both emerged in the two river basins to support the growing population. Falling silver prices, however, brought a major depression in the mining industry by the 1880s, however, and with it the search for recovery. Cattle ranching helped for a while, but unpredictable market prices, high railroad transportation costs, and several severe winters forced many ranchers into bankruptcy. William M. "Big Bill" Stewart and other Nevada politicians took up the causes of remonetizaton of silver and irrigation as ways to put the state's economy back on firm footing (Rowley 1995: 113).

Silver Party politics didn't go very far, but the cause of irrigation as a way to develop an agricultural economy in Nevada set the stage for the Newlands Project. John Wesley Powell and several western senators, most notably Nevada senator William M. Stewart, led the drive to develop the arid western lands for agricultural purposes. The drive was a late nineteenth century extension of the national movement to expand Westward. As early as 1862, the Homestead Act of 1862 not only encouraged settlement in the American West but also reflected a national "back-to-the-land" movement to restore rural values to American life (Rowley 1991). More homesteading legislation in the first two decades of the twentieth century brought a renewed effort to settle public lands in the American West. The legislation includes the Reclamation Act of 1902, the Forest Homestead Act of 1906, the Enlarged

Homestead Act of 1909, and the Cattleman's Homestead Act of 1916) (Rowley 1991). The Reclamation Act withdrew 2.6 million acres of land from public domain and opened it to homesteading, including thousands of acres of Newlands Project land.

The Beginnings of the Newlands Project

On October 2, 1888, congress appropriated $100,000 for the U. S. Geological Survey to assess the reclamation possibilities of the arid western states. One of the USGS survey teams arrived in the Lahontan Valley about a month later and spent the next several months mapping the potential sites of several structures, including Derby Dam and the Truckee Canal. The project, however, remained on hold for another decade in the aftermath of Powell and Stewart's bitter fight over whether the reclamation lands and projects should be under federal or state control. In 1902, the project gained new life with the passage of the Reclamation Act under the guidance of Nevada congressman, soon to be Senator, Francis G. Newlands and with the strong support of President Theodore Roosevelt. President Roosevelt organized the Reclamation Service the same year to administer new federal reclamation projects with the goal of opening up the American West to new agricultural settlement.

Work started on the first reclamation projects the following year (1903), one of which, and the earliest in Nevada, was the Truckee-Carson Project, renamed the Newlands Project in 1919 in honor of Senator Newlands. The original plan for the project called for 450,000 acres of irrigated land with waterworks extending from Lake Tahoe into the Carson and Truckee River basins and beyond to Lovelock and the Humboldt Sink (Townley 1998: 22, 36). Several reservoirs, diversion dams, and canals formed the core of the planned waterworks. The diversion dams and canals would be constructed first, followed later by storage facilities of at least five reservoirs on each of the two rivers (Simonds 1996: 8). By 1926, however, the Reclamation Service found that the waterworks could irrigate only about 87,500 acres (Townley 1998: 48).

Construction and Engineering History

The Secretary of the Interior authorized work on the Truckee-Carson (Newlands) Project in March, 1903. Almost immediately, the Reclamation Service opened an office in Reno and placed Leon H. Taylor, formerly a USGS hydrographer who played an important role in selecting the Truckee-Carson site, in charge of the project (Simonds 1996: 8). Construction first began on the Derby Diversion Dam and the Truckee Canal. The plan called for Derby Dam to divert water from the Truckee River into the Truckee Canal, which then would carry the water 32 miles to the Carson River. For purposes of construction, the Reclamation Service divided the Truckee Canal project into three divisions and solicited separate bids for the construction of each division. Division 1 included Derby Dam, the headworks of the Truckee Canal, and the first six miles of the canal; Divisions 2 and 3 covered the remainder of the canal (Simonds 1996: 8). The Reclamation Service opened the first bids for the project on July 15, 1903 (Simonds 1996: 8). (Note, however, that Townley 1998: 24 gives the date as June 13, 1903.) Work began soon afterwards. The contractors, advertising widely in cities throughout the American West, hired more than 500 men to work on the dam and another 1,000 workers to dig the 32 mile canal.

Because of the remoteness of the project location, construction workers had to live in temporary camps set up nearby. The first workers lived at Derby camp on the Truckee River, which soon acquired a reputation as a "hell hole" of violence, crime, gambling, and prostitution. In 1904, the Reclamation Service moved their Reno office to Hazen on the Southern Pacific Railroad and the closest railhead to the ongoing construction of the Truckee Canal and canals in the Lahontan Valley (Townley 1998: 26). Growing rapidly, Hazen soon enjoyed the same reputation as Derby camp. Other work camps are associated with the Truckee Canal. The Reclamation Service organized the construction of the Truckee Canal into three 10 mile divisions and contracted separately for each division, resulting in three work camps spaced about 10 miles apart (Townley 1998: 25). Completion of Derby Dam and the Truckee Canal brought about the abandonment of all these work camps except for Hazen, which also played an important role in the construction of Lahontan Dam between 1911 and 1915. The Lahontan Dam construction camps of Lahontan City and Bohunkville grew up during this time period. Lahontan City grew up on high ground north of the site of the dam. English-speaking workers, supervisors, and some families lived at the settlement, which had a cookhouse, billiard hall, barber shop, library, and its own marching band (Townley 1998: 30). Slavic workers from eastern Europe lived at Bohunkville next to the dam site along the Carson River. After the completion of Lahontan Dam in 1915, Lahontan City and Bohunkville were abandoned and Hazen rapidly declined.

In addition to the laborers, the contractors used three large Fresno drag-line excavating machines powered by horses and mules to dig the Truckee Canal (Simonds 1996: 9; Townley 1998: 25). Four tunnels also had to be excavated for the canal. Senator Newlands dedicated the Derby Diversion Dam and opened the headgates of the Truckee Canal on June 17, 1905, two years after the construction project began.

On September 9, 1904, the Reclamation Service awarded the first contract for the construction of the Carson River Diversion Dam and the water conveyance structures that would carry the water to farmers takeout ditches in Lahontan Valley (Simonds 1996: 10). The water conveyance structures included two main canals to carry water from the Carson River Dam to the vicinity of the farms. One was the nine mile long northside canal (T Canal) on the north side of the river; the other was the 27 mile long southside canal (V Canal) on the south side of the river. They also included the first phase of what eventually developed into a massive network of 300 miles of lateral canals and almost 350 miles of drains. Work on the Carson River end of the project came to a close on July 21, 1905. The first water reached project farms in February of 1906.

After this first construction phase, the Newlands Project added a few secondary diversion dams and main canals. These include the Coleman Diversion Dam and the Sagouspe Dam, both on the Carson River below the Carson River Diversion Dam and constructed in the years between 1935 and 1945. In addition, they constructed lateral canals for several more years. The Civilian Conservation Corps (CCC), one of the New Deal federal government relief programs, played an

did CCC work on any of the first 5 reclamation projects important role in this later construction. They established Camp Fallon at the west edge of Fallon, Nevada, in 1935 to house CCC enrollees assigned to the Newlands Project (Townley 1998: 68). Camp Carson River followed soon thereafter, later replaced by Camp Newlands in downtown Fallon. In the next few years, the CCC worked on Sheckler Reservoir, renovated the Truckee Canal, rebuilt diversion gates, installed bridges and culverts, cleaned canals and laterals, and dug new drains (Townley 1998: 68). The last CCC camp closed in 1942.

The second planned phase of the Truckee-Carson Project constructed storage facilities. Toward this end, the Reclamation Service contracted for the construction of the Lake Tahoe Dam in 1905; however, the work came to an immediate stop because of an injunction filed by power companies with existing water claims, a continuation of previous legal actions (Simonds 1996: 11). Irrigation water shortages starting as early as 1908 and the inability to build the Lake Tahoe Dam soon led to a decision to construct a storage dam and reservoir on the Carson River. In 1910, the Secretary of the Interior authorized the facility, Lahontan Dam, to be built close to where the Truckee Canal emptied into the Carson River. Construction on Lahontan Dam started in February of 1911. The Reclamation Service first built a hydroelectric power plant at the site to supply power for the construction project. After its completion in early November of 1911, the power plant generated 1,000 kilowatts of power by diverting water from the Truckee Canal into a 500 foot long steel penstock to drive two turbine-powered General Electric 500 kilowatt generators (Simonds 1996: 13). The power plant supplied electricity to run much of the construction machinery used on the project. D.W. Cole, the project manager, stated that

> Probably the first electric shovel was employed on this work and handled the 500,000 cubic yards of gravel at a cost very much below what a steam shovel would have shown at the local prices for coal. (Engineering News, volume 73, April 22, 1915, page 760)

In addition, the power plant ran electric motors on a dragline excavator, a 925 foot long belt conveyor to transport gravel and soil to the main embankment, the sand-cement batching plant, a 1,600 foot long cableway for transporting concrete, and numerous pumps, blowers, drills, and conveyors.

The Reclamation Service finally completed the Lake Tahoe Dam in 1913 during the construction of Lahontan Dam after the agency and the power company reached an agreement. Lake Tahoe Dam is an 18-feet high and 109-feet long concrete slab and buttress structure that controls the top six feet of Lake Tahoe with a series of 17 gates. The completion of both dams brought to a close the construction of primary water storage facilities on the Newlands Project. Continuing drought years in the 1920s and 1930s, however, led to intense political pressure to construct more storage facilities (Townley 1998: 49). The initial Newlands Project plan called for the construction of a reservoir in Spanish Springs Valley, and the Reclamation Service decided to build such a facility by 1920. They abandoned the idea by 1926, however, upon encountering intense opposition from downstream water users in the Lahontan Valley because of the threat of higher water costs. The search for more upstream storage continued. In 1939, the completion of Boca Dam on the Little Truckee River added more upstream water storage capacity that is available under some circumstances to water users in the Newlands Project, although the dam is not considered to be part of the Project. Several downstream secondary reservoirs also came into line beginning in 1935 with the work of the CCC, which built the S-line regulating reservoir and Sheckler Reservoir between 1935 and 1942. Stillwater Point Reservoir was constructed between 1942 and 1945 and, still later, Harmon Reservoir and Old River Reservoir.

Drainage problems created another engineering challenge for the Truckee-Carson Project. The original engineering plan called for large open trenches spaced ½ mile apart to adequately drain the fields, but cost cutting decisions greatly reduced the size and number of drains. Early drains included a tile system that failed. As early as 1909, rising water tables and salinization in newly irrigated agricultural fields threatened the failure of the project. The Reclamation Service responded by insisting that the farmers were responsible for draining their own fields. They, however, agreed in 1916 to begin work on a better drainage system as soon as a water users association could be organized that could contract for the excavation of new drains. The state of Nevada legislature approved formation of a new irrigation district in March, 1917, and the Truckee-Carson Irrigation District formally came into existence on November 16, 1918. Some drains were constructed in Fernley in the same year. The name of the Truckee-Carson Project officially changed to the Newlands Project in March of 1919, two years after the death of Senator Newlands. In 1921, work began on the first phase of the drainage project, which ended in 1924. Construction crews excavated over 150 miles of deep open drains that were 10 feet deep and nine feet wide at the bottom. Late in 1926, the Secretary of the Interior officially contracted with the Truckee-Carson Irrigation District (TCID) to operate and maintain the Newlands Project. The Bureau of Reclamation turned over all maps, files, records, and documents of the project to the TCID. The second phase of the drainage project began in 1926 and ended in 1928, completing another 81 miles of drains. Soon afterwards, the water table in the irrigated fields dropped dramatically, causing one Reclamation Service engineer to write that "a real transformation has taken place on the Newlands Project which, in 1921, was practically an alkali bog" (Townley 1998: 47). Drains, however, continued to be built after 1928 to relieve sporadic drainage problems.

The Newlands Project and Regional Economic Development

The Newlands Project clearly played the key role in the twentieth century economic development of the region. Most of the project water supported agriculture, irrigating about 6,200 acres in the Fernley area and another 66,700 acres in the Lahontan Valley (Simonds 1996: 38). Today, however, the irrigated acreage is being reduced by changes in cropping patterns, agricultural practices, urban development, and the acquisition of water rights by the U.S. Fish and Wildlife Service. The pattern of development of the region reflects not only engineering problems with the project such as inadequate water and drainage but also larger economic patterns such as the Great Depression. Irrigated farming using water from the Carson River first developed significantly in the region in the 1870s and increased to about 5,000 acres by the end of the decade (Townley 1998: 9). The farms produced mostly hay and grain to be sold in the mining towns of the region. More irrigation and the growth of the beef cattle industry in the region in the

1880s and 1890s brought demands for water storage and public reclamation that ultimately helped create the Truckee-Carson Project (Townley 1998: 9). The project initially planned to irrigate 400,000 acres in the region. Toward this end, the Reclamation Service opened up 800 parcels of land for settlement in the project in 1904 (Simonds 1996: 36). Farms occupied only 300 of these by 1908, and lack of water forced closure of the project to new settlement in 1910 (Simonds 1996: 36). The project reopened in late 1914 after the completion of Lahontan Dam. Veterans attracted to the project after World War I brought the number of farms up to 906 by 1922 (Simonds 1996: 37). The number of project farms dropped during the Depression Era but rose to 729 by 1940 and continued to grow thereafter, increasing to 990 by 1965 and to 1,200 in 1980 (Simonds 1996: 37). Alfalfa production supported many of the project farms from the beginning and continues to be the mainstay of the region. The farmers also experimented, however, with a variety of other crops, especially sugar beets in the 1900s and 1910s, melons in the 1910s and 1920s, eggs and poultry in the 1920s and 1930s, dairy cattle, and orchards (Townley 1998: 57-66; Simonds 1996: 38).

The Newlands Project and Water Litigation

The Newlands Project since its inception found itself often embroiled in water litigation. Many of the issues focused on Lake Tahoe (Simonds 1996: 11-12). The initial plan for the project assumed that the water in the lake would be available to meet most of the irrigation needs downstream. To do this, however, the Reclamation Service had to gain control of the water. They attempted to acquire a small dam at the outlet of Lake Tahoe operated by the Donner Boom and Logging Company in 1902. The company, however, sold the dam to the Truckee River General Electric Company instead. In July of 1904, the Reclamation Service acquired land just below the dam and began construction on a new dam in 1905. The downstream power companies filed an injunction to stop the project. Not until 1913 did the Reclamation Service and the power companies reach an agreement that allowed completion of the new Lake Tahoe dam (Simonds 1996: 17). On July 1, 1915, the United States finally received control over water in Lake Tahoe with issuance of the "Truckee River General Electric Decree," which gave the Reclamation Service an easement to operate the Lake Tahoe Dam and surrounding area and which guaranteed minimum year-round flow rates in the Truckee River for hydroelectric operations downstream (Simonds 1996: 18).

Another stage for water litigation was the Truckee River itself. The Reclamation Service began legal proceedings in 1913 to adjudicate the rights of water users on the Truckee River upstream from Derby Dam (Simonds 1996: 18). Not until the issuance of the Orr Ditch Decree in 1944 did litigation finally end.

The issuance of the Talbot Decree in 1926 allocated the Truckee River water among its users and appointed a Federal Water Master for the river (Simonds 1996: 22). In the meantime, several other legal events went into play. The 1935 Truckee River Agreement established the natural rim of Lake Tahoe, allowed for storage of just over six feet of water in the lake, incorporated minimum flow rates, and contained language for settling disputes over pumping of Lake Tahoe water during periods of low water (Simonds 1996: 24). The 1944 Orr Ditch Decree established individual water rights on the Truckee River within the framework of the Truckee River Agreement and granted the two most senior rights to the Pyramid Lake Paiute Indian Tribe (Simonds 1996: 24).

Pyramid Lake, although not part of the Newlands Project, emerged as another key stage for water litigation associated with the Newlands Project. The impact of the Newlands Project on Pyramid Lake reached a critical point in 1967, when the lake dropped to its lowest level in history and prevented lake fish from migrating upstream to spawn (Simonds 1996: 34). The Pyramid Lake Tribe initiated a series of lawsuits in 1968 intended to stop the falling lake levels. In 1973, the Gesell Opinion required that the Newlands Project reduce the amount of water diverted from the Truckee River at Derby Dam and that any water in excess of Newlands rights be delivered to Pyramid Lake. The passage of the Endangered Species Act in the same year also affected the legal relationship of Pyramid Lake to the Newlands Project (Simonds 1996: 28, 35).

PROPERTY TYPES - If you're extending the P of Sig, you may have other property types

The historic resources of the Newlands Project fall into several property types. They include dams, water conveyance structures, power plants, and pumping plants. National Register guidance documents define the property types as a "grouping of individual properties characterized by common physical and/or associative attributes" and consider it to be the key link between historic context and individual resources (e.g., National Park Service 1991).

Dams

Dams are earthen, rock, and/or concrete structures used to store or divert water. The Newlands Project includes both diversion dams and storage dams.

Diversion Dams

The first dams to be constructed by the project divert water from the Truckee and Carson Rivers into canals. Four diversion dams are incorporated into the Newlands Project (USDI Bureau of Reclamation 1990: 118). Derby Diversion Dam, constructed between October, 1903, and June, 1905, diverts water from the Truckee River into the Truckee Canal, which brought it 32 miles to the lower end of the Carson River. Carson River Diversion Dam, constructed between 1904 and 1905, diverts water from the Carson River five miles northeast and downstream of Lahontan Dam into the southside main Canal (V, L, and S-lines) and the northside main Canal (T-line), which carry water to farms in the vicinity of Fallon, Nevada. Two other diversion dams, Coleman and Sagouspe, were constructed later by the TCID but are part of the Newlands Project. Coleman Diversion Dam is situated downstream from the Carson River Diversion Dam and was constructed in 1935. Sagouspe Diversion Dam is situated downstream from the Coleman Diversion Dam and was constructed in 1940.

Applicable criterion Area A Sig

Derby Diversion Dam consists of a concrete gate structure 31 feet high, a crest length of 170 feet, a volume of 37,000 cubic yards of concrete, and a diversion capacity of 1,500 cubic feet per second. The gate structure is flanked on the left by an earth embankment wing, making the total crest length of the dam 1,331 feet. Near the center of the concrete structure of the dam are a 25- by 10-foot hinged weir gate and thirteen 5- by 10-foot double leaf slide gates. Originally, the dam contained sixteen 5 x 10 feet sluice gates for controlling the river flow (Boyle 1911: 8). The large gate is an alteration made in 1929. Periodic maintenance activities also modified the apron for Derby Dam before its complete replacement in 1999. Adjoining the dam on the right, and at a right angle to it, is a concrete headworks structure for the Truckee Canal. The canal headworks contain nine 5 x 10 feet double leaf slide gates for the control of water into the Truckee Canal.

Carson River Diversion Dam is a concrete gate structure 23 feet high with a crest length of 241.1 feet, a volume of 3,000 cubic yards of concrete, and a diversion capacity of 1,950 cubic feet per second. The outlet works consist of a spillway with twenty-one 5- by 10-foot double leaf slide gates and one 15- by 10-foot gate. The canal headworks consist of three 5- by 15-foot double leaf rising weir gates for the V-Canal and two 7- by 5-foot wood slide gates for the T-Canal.

Coleman Diversion Dam is a concrete weir structure 5.9 feet high with a crest length of 100.1 feet and a diversion capacity of 158.9 cubic feet per second. The dam augments water into the S-line Canal through the S-line diversion channel.

Sagouspe Diversion Dam is an earth and concrete gate structure 12.1 feet high with a crest length of 399.9 feet and a diversion capacity of 38.8 cubic feet per second. The D-canal diverts water from the Carson River just above the Sagouspe Diversion Dam.

Storage Dams

Other dams constructed by the project collect and hold water for later use. Three storage dams are incorporated into the Newlands Project (USDI Bureau of Reclamation 1990: 30). The earliest of these is Lake Tahoe Dam, completed in 1913 at the outlet of Lake Tahoe into the Truckee River. Lake Tahoe Dam increases the water storage capacity of Lake Tahoe and regulates the flow of water from the lake into the Truckee River. The Lake Tahoe Dam is a concrete slab-and-buttress sluice way regulator control structure 18 feet high, a crest length of 108.9 feet, a volume of 400 cubic yards of concrete, and a capacity of 732,000 acre-feet. The outlet works consist of seventeen 5- by 4-foot outlet gates. Safety inspections of the dam in 1978 and 1980 found damage in the concrete apron downstream from the dam and structural problems with the dam's ability to withstand an earthquake (Simonds 1996: 29-30). The inspections led to repair work and structural changes in the dam in 1987 and 1988 (Simonds 1996: 30-31). Alterations included the construction of a new sheet pile wall downstream from the dam, the replacement of the damaged apron with new reinforced concrete, the construction of reinforced concrete stabilizing walls in the existing embankments, the installation of concrete embankment caps over both embankments, and reinforced embankment and slope protection.

The second storage dam to be constructed in the Newlands Project is Lahontan Dam, built between 1911 and 1915 at the lower end of Carson River. Lahontan Dam impounds water from the Carson River drainage basin as well as water diverted from the Truckee River via the Truckee Canal. Lahontan Dam is an earthen and concrete dam 162.1 feet high with a total crest length, including dike, of 5,400 feet, a volume of 733,000 cubic yards of concrete, and a capacity of 317,000 acre-feet. The main embankment, built in the bed of the Carson River, has a crest length of approximately 1,300 feet including a spillway crest 250 feet in length at each end. The two spillways step down with the terrain, curve, and converge on a circular spillway pool 220 feet in diameter. An earthen wing dam or dike about 4 feet high, level with the top of the principal dam, extends southward for three-quarters of a mile. The dam is 20 feet wide at the top and 660 feet wide at the base. A 12 feet wide roadway at the top of the dam is carried across each of the two spillways by five-span continuous reinforced concrete arches with 50-feet spans and five feet rises. The outlet works consists of an outlet tower of massive reinforced concrete in which are set 12 gates at two different elevations. Water from Lahontan reservoir is let into the tower through a nine feet diameter conduit controlled by a hydraulically balanced cylindrical valve at the bottom of the tower. A six feet six inch diameter steel penstock, also controlled by a cylindrical valve, carries water to the Lahontan power plant. A concrete penstock and separate outlet at the left or north side of the dam was abandoned in 1924. All of the gates in the outlet tower are controlled by hydraulic oil pressure provided by an electrically powered pump. The dam has a gatehouse. Other alterations on the dam began as early as 1918, when a gunite coating was used to repair deteriorating concrete in the dam spillways (Simonds 1996: 29). Additional repair work in 1985 covered both spillways and the walls and the floors of the stilling basin with six-inch thick concrete overlays (Simonds 1996: 29).

A third storage dam is sometimes included in discussions of the Newlands Project although technically not a part of it. The Truckee Storage Project constructed Boca Dam between 1937 and 1939 on the Little Truckee River about one mile from its junction or from the confluence of the Truckee River. Boca Dam collects and stores water from the Little Truckee drainage basin, regulates its flow into the Truckee River, and provides supplementary irrigation water for the Truckee Meadows. Boca Dam is a zoned earthfill structure 100 feet high, a crest length of 1,629 feet, and a volume of 912,000 cubic yards of earth. The spillway is 40 feet wide. The outlet works consists of a concrete-lined tunnel in right abutment to two 4 x 4 feet slide gates in the gate chamber; thence two plate steel outlet pipes, controlled by two 42-inch needle valves.

In addition, the Newlands Project includes five small storage dams (USDI Bureau of Reclamation 1990: 30-31). The CCC built the earliest of these between 1935 and 1942. CCC workers completed the S-Canal Dam in 1936. The earth fill dam is 13.1 feet high with a crest length of 8,400 feet and a capacity of 2,000 acre feet. CCC workers also worked on Sheckler Dam, which was completed in 1957. The dam is an earth fill structure 29.9 feet high with a crest length of 23,000 feet and a capacity of 17,000 acre-feet. Other dams within the project area were added later. The Stillwater Point Dam is an earth fill structure constructed in 1945 and is 15.1 feet high with a crest length of 100.1 feet and a capacity of 7,000 acre-feet. Ole's Pond Dam is an earth fill structure constructed in 1954 and is 15.1 feet high with a crest length of 2,600 feet and a capacity of 5,000 acre-feet. Harmon Pasture Dam is an earth fill structure constructed in 1957 and is 7.9 feet high with a crest length of 3,900 feet and a capacity of 1,000 acre-feet.

Water Conveyance Systems

what phase constructed

Another core component of the Newlands Project are the water conveyance and regulating structures used to carry water and control its flow from the storage and diversion structurès to the farmlands. They include main canals, lateral canals that carry water from the main canal to irrigation ditches on the farms, drains, and a variety of regulating, diversion, and protective structures. The designation of canals and laterals used in the following sections are the ones currently in use, but other names were used when the system was first built.

how would you group these? distinct? structure?

Main Canals

All prime lettered canals in the Newlands Project are considered to be main canals. They include the Truckee Canal (TC) and the A, D, E, G, L, N, R, S, T, and V Canals. Rock Dam Ditch 1 and 2 are short main canals situated shortly downstream from Lahontan Reservoir. The Newlands Project includes approximately 122 miles of main canals (USDI Water and Power Resources Service 1981: 689). Between 1903 and 1905, the U.S. Reclamation Service constructed the first of these, the Truckee Canal, which carries water from Derby Diversion Dam 32.5 miles to Lahontan Reservoir (USDI Bureau of Reclamation 1990: 172). In addition, the canal irrigates about 20,000 acres of farmland in the vicinity of Wadsworth and Fernley. The Truckee Canal is approximately 20 feet wide at the bottom, 13 feet deep, both concrete and earth lined, and has a typical maximum water flow of 1,000 to 1,500 cubic feet per second. In addition to the ditch, the canal includes the headworks at Derby Dam, two wasteways regulated by a circular gate to return unwanted water to the river, several control gates, two farm "take-offs" consisting of 15-inch vitrified pipe, and three concrete-lined tunnels ranging in length from 308 feet to 1,520 feet (USDI Bureau of Reclamation 1990: 223). (The Pyramid Branch lateral canal, which was planned to be constructed six miles from the Derby Dam headworks, apparently was never built.) The Truckee canal empties into Lahontan Reservoir, at first through a wooden chute lined with sheet metal and later, after 1911, through a concrete structure (Boyle 1911: 8). Other alterations to the canal occurred in 1927 to repair the cracking of concrete lining in two of the tunnels (Tunnels Numbers 1 and 3) (Simonds 1996: 22). The alterations consisted of placing railroad rails to support the roofs of the tunnels. Some additional repair work on the two tunnels took place in 1971, and the concrete lining of Tunnel Number 3 was replaced completely in 1976 (USDI Water and Power Resources Service 1981: 690). Yet other alterations to the canal occurred between 1935 and 1938, when CCC workers cleaned silt and vegetation out of the canal (Smith 1938: 123). TCID also has removed silt and vegetation from the canal as part of its on-going operations and maintenance responsibilities.

The southside main canal, often referred to as the V-Canal or V-line, carries water from the Carson River east from the Carson River Diversion Dam south of the Carson River to the vicinity of Fallon, Nevada. Constructed from 1904 to 1905, the earthen Canal is 27 miles long,

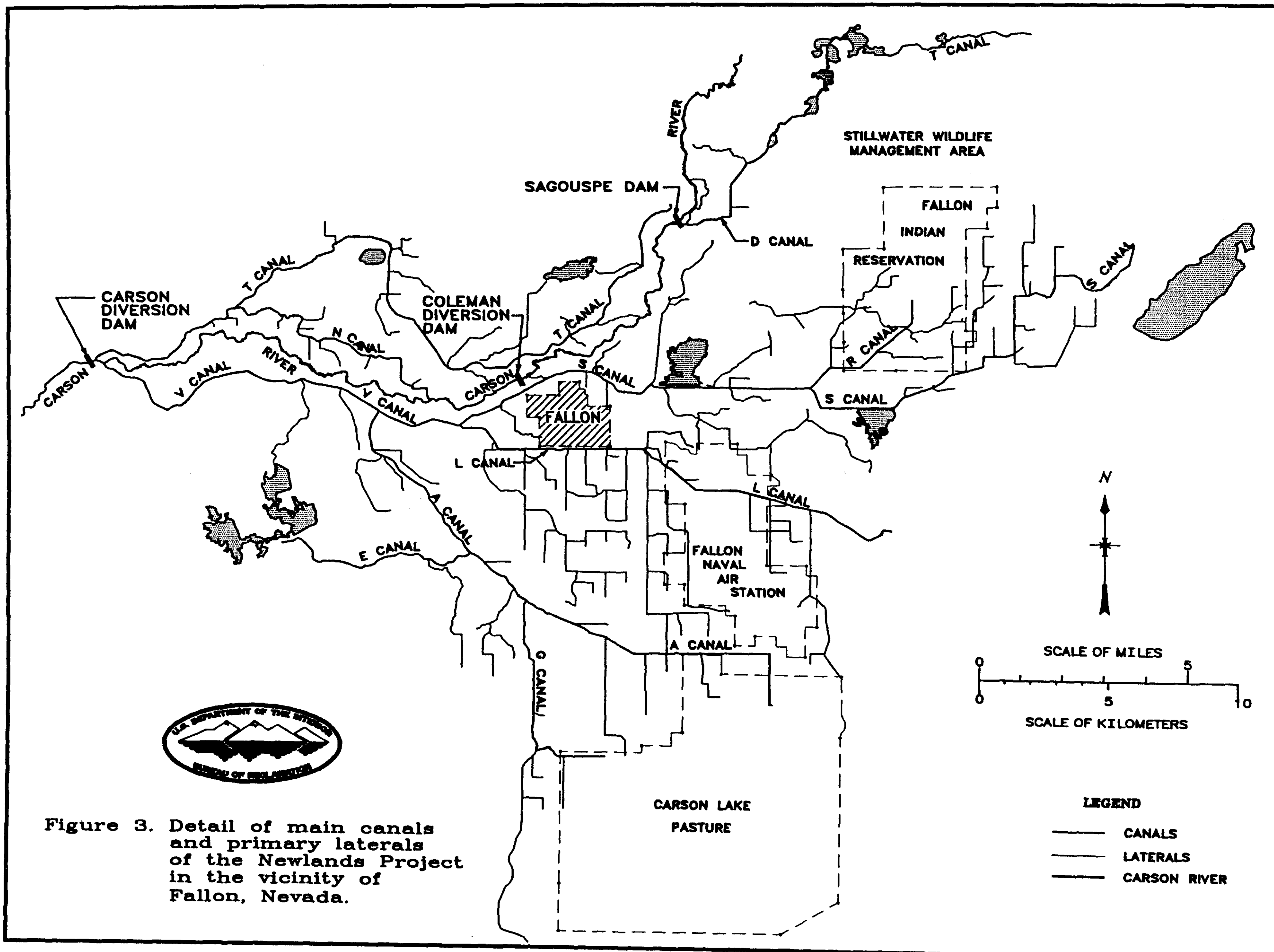


Figure 3. Detail of main canals and primary laterals of the Newlands Project in the vicinity of Fallon, Nevada.

22 feet wide at the bottom, 12 feet deep, and has a typical maximum water flow of 1,500 cubic feet per second (USDI Bureau of Reclamation 1990: 172). It includes a headgate at the Carson River Diversion Dam with three 15 feet by 5 feet double leaf "rising weir" type gate openings, a 26-feet drop and power house 5.8 miles below the headgate, and a combined fall and wasteway 1.25 miles below the power house (Hardesty 1906: 193-217). The S-line, its principal branch, extends the southside main canal an additional 5.28 miles.

The northside main canal, often referred to as the T-Canal or T-line, carries water east from the Carson River Diversion Dam north of the Carson River to the vicinity of Fallon, Nevada. Also constructed between 1904 and 1905, the earthen T-Canal is 9 miles long, 10 feet wide at the bottom, six feet deep, and has a typical maximum water flow of 450 cubic feet per second (USDI Bureau of Reclamation 1990: 172). It includes a headgate at the Carson River Diversion Dam with a single "rising weir" type gate opening. Later, the gate was replaced with two 7- by 5-foot wood slide gates. What was originally named the "U" canal is now designated as the T-line. It has a total length of 55,420 feet (ca. 10.5 miles), a base width that varies from five feet to eight feet, and a depth that ranges from 2.75 feet to four feet.

The A-line begins eight miles below the Carson headworks of the V-line and has a total length of 70,630 feet (ca. 13.4 miles), a base width that varies from four feet to 13 feet, and a depth that ranges from three feet to six feet (Hardesty 1906: 253-254).

Lateral Canals and their Branches

how would you group these?

A lateral canal is a water conveyance structure that draws water from a main canal. Lateral canals or their branches carry water to the approximately 1,000 individual farms in the Project area. The Newlands Project includes 312.1 miles of lateral canals (USDI Water and Power Resources Service 1981: 689). The first laterals were constructed in 1904 (Simonds 1996: 11). Appendix 1 lists the lateral canals in the Newlands Project. They are labeled with a letter and a number (e.g., A1 or S12 or TC5) to indicate the main canal from which they draw water and their relative position along the main canal. Sub-laterals are defined as branches of the lateral canals. They are labeled with a letter and two numbers (e.g., A1-1 or S12-1) to indicate the main canal and lateral canals from which they draw water and their relative position along the lateral canal. Some of the sub-lateral canals also have branches, which are designated as sub-sub-lateral canals and follow the same system of numbering (e.g., A1-1-1).

Drains

A drain is a water conveyance structure that carries water away from irrigated agricultural fields to prevent rising water tables. Drains have been extremely significant water conveyance structures in the history of the Newlands Project. The original engineering plan called for large open trenches spaced ½ mile apart to adequately drain the fields, but cost cutting decisions greatly reduced the size and number of drains. Drains constructed in 1906, therefore, are closely associated with earliest construction of the Newlands Project. As early as 1909, rising water

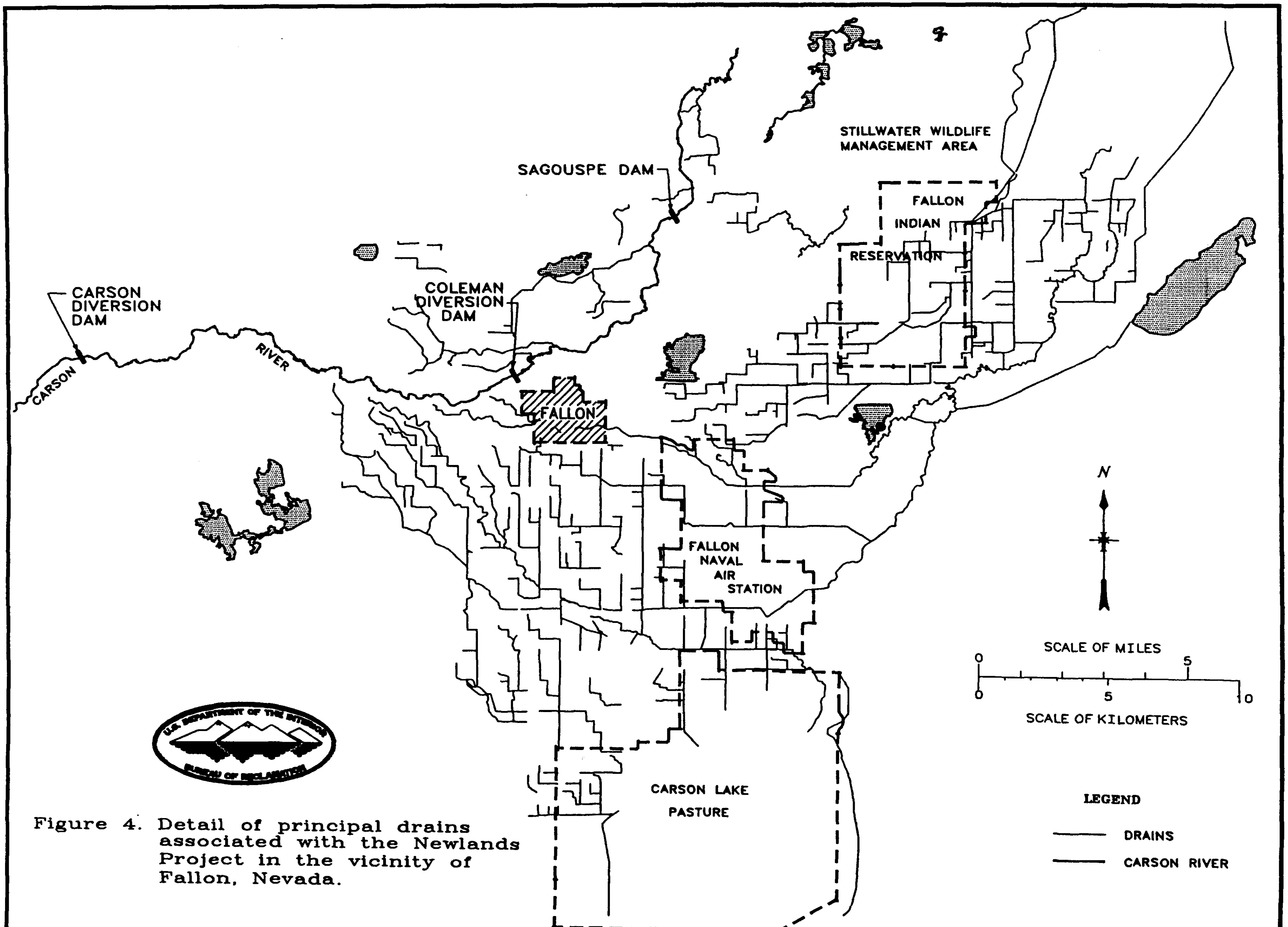


Figure 4. Detail of principal drains associated with the Newlands Project in the vicinity of Fallon, Nevada.

tables and salinization in newly irrigated agricultural fields threatened the failure of the project. The Reclamation Service responded by insisting that the farmers were responsible for draining their own fields. They, however, agreed in 1916 to create a water users association that could contract for the excavation of new drains, and the Truckee-Carson Irrigation District formally came into existence on November 16, 1918 (Truckee Carson Project History 1918). In 1921, work began on the first phase of the project and ended in 1924. Construction crews excavated over 150 miles of deep open drains that were 10 feet deep and nine feet wide at the bottom. The second phase of the project began in 1926 and ended in 1928, completing another 81 miles of drains. Soon afterwards, the water table in the irrigated fields dropped dramatically, causing one Reclamation Service engineer to write that "a real transformation has taken place on the Newlands Project which, in 1921, was practically an alkali bog" (Townley 1998: 47). Drains constructed between 1921 and 1928, therefore, are closely associated not only with the success of the Newlands Project but also with the history of the Truckee-Carson Irrigation District. Finally, drains continued to be built after 1928 to relieve sporadic drainage problems. In all, the Newlands Project includes 345 miles of open drains (USDI Water and Power Resources Service 1981: 689).

Regulating, Diversion, and Protective Structures

Many different types of regulating structures are associated with the canals and drains that carry water to and from individual farms (Aisenbrey et al 1978; Hardesty 1906: 242-252). They include headworks, wasteways, drops, checks, and turnouts. Headworks are structures that control the flow of water from a supply source such as a diversion dam into a main canal. They normally consist of an adjustable gate through which water flows into the canal. Wasteways are protective structures that remove excess water from canals originating in storm runoff or other causes. They typically consist of an overflow or gate in combination with a channel to carry water away from the canal. Drops are structures used to carry water from a higher elevation to a lower elevation and to dissipate the resulting excess energy. They consist of a vertical drop off for short distances of about three feet or less and either rectangular concrete inclines or inclined pipes for longer distances. Checks are used to regulate the amount of water that flows through a canal downstream of and the depth of water upstream of the structure. They are similar to small-scale dams across the canal with gates that can be opened and closed. Turnouts are headgates above the check structures that take water out of the canals and deliver it to the farmer's fields. Sometimes called delivery structures, they normally consist of a stop-gate or a check in the larger canal and a diversion gate set at right angles to it to carry water into the smaller canal. The CCC replaced or added 1,807 water conveyance and regulating structures in the Newlands Project, including headworks, wasteways, drops, checks, and turnouts, between 1935 and 1942 (Pfaff 1999).

how would you group these?

Power Plants

Another use of the Newlands Project is for the generation of hydroelectric power. The Lahontan power plant was constructed in 1911 and was used as a source of power during the construction of Lahontan Dam. Initially, the rectangular stone and concrete structure contained two 500 kilowatt generators manufactured by General Electric and driven by Francis turbines manufactured by the Pelton Waterwheel Company fed by a steel penstock with water from the Truckee Canal (Simonds 1996: 13). The Canyon Power Company, which operated the power plant under a lease agreement, added a third turbine-powered 500 kilowatt generator in 1915 for a total power output of 1,500 kilowatts (Simonds 1996: 18). Upon completion of the dam, they added a secondary concrete penstock feeding water from the reservoir to the primary steel penstock from the Truckee Canal. Power outages, however, sometimes occurred in late summer when the flow from both the canal and the reservoir level dropped too low to use either penstock. To correct the problem, the concrete penstock was replaced with another steel penstock running from the base of the outlet tower into the power house in June of 1925 (Simonds 1996: 21). More modifications to the power plant between 1947 and 1954 upgraded the output of each of the three generators to 640 kilowatts, giving a combined total of 1,920 kilowatts (Simonds 1996: 25). The TCID also installed two new 1,000 kilowatt diesel powered generators next to the Lahontan power plant in 1949 (USDI Water and Power Resources Service 1981: 687). Both of these generators, however, were removed about five years ago. Power plants generate electricity but the transmission of electricity to the consumer requires transmission lines. The TCID "built 73 miles of 33-kilovolt transmission lines from the Lahontan power plant to the city of Fallon; the towns of Fernley, Wadsworth, Hazen, and Stillwater; Indian reservations; and most of the rural areas of the project" (USDI Water and Power Resources Service 1981: 688).

The Newlands Project presently includes one other power plant, which, however, falls outside the 50-year cutoff date for National Register eligibility. Although the base structure (drop structure) was built early in the project, the plant was not completed until 1955. The V-Canal power plant is a rectangular poured concrete structure, approximately 40 x 60 feet in size, and situated at a 26 feet drop in the canal, six miles west of Fallon, Nevada. The power plant, which uses two 400 kilowatt generators, was built by TCID and was operated by Sierra Pacific Power Company, which fed the plant's output into their power grid, for several years. Today, the TCID operates the plant.

Pumping Plants

Another property type in the Newlands Project is the pumping plant, which lifts water to a higher elevation and expands the land area available for irrigation. The pumping plant at Lahontan Dam was constructed in 1924 and used to transport water to the Swingle Bench district (Simonds 1996: 23). Consisting of two 500 horsepower units, the plant pumped water from the reservoir into the Truckee Canal. The project abandoned the pumping plant in 1971, and it no longer exists. Another example of this property type is the Stillwater pumping plant (Malone 1931: 147). (This plant may no longer exist.) In addition, the project includes several small pumping plants that transport water from one canal to another.

Registration Requirements

integrity

7 Registration Requirements

SIGNIFICANCE CRITERIA

The determination of eligibility of Newlands historic properties for the National Register of Historic Places begins with significance. National Register criteria A-C consider the significance of historic properties to be based upon their ability to convey important aspects of national, state, or local history to the present.

Newlands historic properties are considered to be significant under criterion A if they evoke or illustrate important historical events, themes, or patterns. The project as a whole is significant for its association with the earliest federally funded reclamation project in the United States and early agricultural development of the lower Carson River. A strong association between the historic property and the original federal reclamation project is critical. Some water engineering properties such as minor irrigation ditches and water control devices, for example, are the responsibility of individual farms and, therefore, do not fall under the supervision of the Bureau of Reclamation. Such properties are not considered to be significant under criterion A.

In addition, the properties may be significant under criterion B if they illustrate the lives of people who made important contributions to history. The project as a whole, for example, is significant under criterion B for its association with Francis G. Newlands. Specific properties also may be significant for their association with the careers of master architects and engineers who designed the dams, canals, and other components of the Project.

The Newlands historic properties also may be significant under criterion C as good examples of the work of an important architect or engineer or as good examples of important architectural or engineering types, patterns, styles, methods, or time periods. They include, for example, dams, canals, power plants, or pumping stations with distinctive characteristics or that were the first of their kind or that play critical roles in the water engineering system. Specific properties may be significant as the only example or the earliest or last of its type in the Project (e.g., diversion dam). Other benchmarks are capacity and length. Is it, for example, the largest of its type (e.g., storage dam as measured by cubic feet of fill or acre-feet of water storage; canal as measured by length and cubic feet per second of water flow)? Is the property an example of a new or innovative or experimental approach to water engineering in the Project?

Finally, the historic properties in the Newlands Project may be significant under criterion D for the information that they contain about important scholarly and scientific issues useful in interpreting the past. Some of the key research issues, for example, include historical changes in the Newlands landscape, settlement patterns, and water engineering technology. Historic properties potentially significant under criterion D include the archaeological remains of construction camps such as Lahontan City, ditch rider houses, experimental farms, and the like.

Period of Significance

The Newlands Project is first and foremost nationally significant as the earliest federally funded reclamation project in the United States. Its association with the federal government, and, specifically, the Bureau of Reclamation, therefore, is critical. The period of time during which the project is directly associated with the federal government, however, is limited. In 1926,, the operation and maintenance of the project was transferred to the TCID, thus ending its direct association with the Bureau of Reclamation. For this reason, the period of significance of the Newlands Project is defined as 1903, when construction began on the project, until 1926, when management of the project was transferred to the TCID.

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Integrity Criteria

The National Register of Historic Places requires that historically significant properties retain enough integrity to convey their significance to the present. What is meant by "retain enough integrity," however, depends upon the resource type being evaluated and the criteria used to determine significance. Significance under criterion D, for example, does not carry the same standard of integrity as significance under criterion A. Likewise, the standards of integrity for an elaborately engineered canal network are quite different from those for small scale irrigation ditches in farm fields.

Elements of Integrity

To assist in setting standards, the National Register defined seven elements of integrity: workmanship, materials, design, setting, location, feeling, and association (1991b: 44-45). The importance of each of the elements varies with resource type and significance criterion. Criteria A, B, and C, for example, all require that the historic property look much like it did during its period of significance. The elements of location, design, materials, and association are most important in assessing integrity under criteria A and B, both of which emphasize the historic fabric of standing buildings and structures. Criterion C places more emphasis upon workmanship, materials, and design, all of which are related to an engineering or architectural style, pattern, type, method, or master. Integrity of association, in contrast, is most important to Criterion D, which requires a close link between the historic property and the information requirements of scientific or scholarly research questions.

Workmanship is defined as "the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory" (National Park Service 1991b: 45). Integrity of workmanship is most important under Criterion C, which places emphasis upon an engineering or architectural style, pattern, type, method, or master. This element is especially important in evaluating the integrity of engineer- or architect-designed properties in the project such as dams, major feeder canals such as the Truckee Canal, power plants, and pumping stations. The benchmark for determining integrity of workmanship is whether or not the historic property retains recognizable physical evidence of significant water works associated with the Newlands Project or the work of a master architect or engineer.

Materials is defined as "the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property" (National Park Service 1991b: 45). Integrity of materials is most important under Criterion C, which places emphasis upon an engineering or architectural style, pattern, type, method, or master. This element is especially important in evaluating the integrity of engineer- or architect-designed properties in the project such as dams, major feeder canals such as the Truckee Canal, power plants, and pumping stations. The benchmark for determining integrity of materials is whether or not the historic property retains recognizable physical evidence of the materials used in significant water works associated with the Newlands Project or in the work of a master architect or engineer.

Design is defined as "the combination of elements that create the form, plan, space, structure, and style of a property" (National Park Service 1991b: 44). Integrity of design is most important under Criterion C, which places emphasis upon an engineering or architectural style, pattern, type, method, or master. This element is especially important in evaluating the integrity of engineer- or architect-designed properties in the project such as dams, major feeder canals such as the Truckee Canal, power plants, and pumping stations. The benchmark for determining integrity of design is whether or not the historic property retains recognizable physical evidence of the configuration of significant water works associated with the Newlands Project or in the work of a master architect or engineer.

Setting is defined as "the physical environment of a historic property" (National Park Service 1991b: 45). Integrity of setting focuses upon the original landscape and viewshed and the extent to which they have been changed. Without question, urbanization and the Fallon Air Station are the key threats to integrity of setting in the Newlands Project, both of which impinge upon the rural character of the original project. This element is especially important in evaluating the integrity of minor canals and drains that have not been elaborately engineered. Integrity of setting is most important under criteria A and B and to a lesser extent under criterion C. This element usually is not important in determining eligibility under criterion D. The benchmark for determining integrity of setting is whether or not the historic property has retained a rural character.

Location is defined as "the place where the historic property was constructed or the place where the historic event occurred" (National Park Service 1991b: 44). Integrity of location is most important under criteria A and B and to a lesser extent under criteria C and D. In the latter case, however, secondary archaeological deposits usually contain less information than primary deposits that have not moved from the original place of deposition. Integrity of location is closely linked with integrity of association. This element is especially important in evaluating the integrity of minor canals and drains that have not been elaborately engineered. The benchmark for determining integrity of location is whether or not the historic property is still in its original location or, in the case of a linear water conveyance structure, follows its original alignment.

Feeling is defined as "a property's expression of the aesthetic or historic sense of a particular period of time" (National Park Service 1991b: 45). Without question, urbanization and the Fallon Air Station are the key threats to integrity of feeling in the Newlands Project, both of which impinge upon the rural character of the original project. This element is especially important in evaluating the integrity of minor canals and drains that have not been elaborately engineered. To what extent have they retained their rural setting? Integrity of feeling is most important under criteria A and B and to a lesser extent under criterion C. This element usually is not important in determining eligibility under criterion D. The benchmark for determining integrity of feeling is whether or not the historic property has retained a rural character.

Association is defined as "the direct link between an important historic event or person and a historic property" (National Park Service 1991b: 45). Integrity of association is especially important if significance is based upon criterion A or B. The association of historic properties in the Newlands Project with the original period of construction is a good example. Integrity of location is closely linked to integrity of association. The movement of historic properties away from their original location, for example, often destroys the association between the property and historic events that took place there. The benchmark for determining integrity of association is whether or not the historic property still retains enough visibility, historic fabric, and location to convey its historic past.

Existing Integrity

The Newlands Project is an ongoing dynamic system. Therefore, it is not surprising that some components in most of the historic properties associated with water engineering in the Project have been replaced, repaired, or modified since their construction. Gates and needle valves, for example, have been replaced in the dams and turnouts or checks replaced in the canals. The historic fabric of these properties, however, is still essentially intact. That is, they still retain integrity of workmanship, materials, and design. Some of the canals have been piped and filled in, however, thereby losing integrity of association but continuing their historic use. The Project also includes many abandoned canals and drains that still follow their original alignment and are quite visible, thereby retaining integrity of association. Finally, it is clear that the Project is rapidly losing integrity of setting and feeling through the forces of urbanization and military training activities at the Fallon Naval Air Station. These elements of integrity, however, are considered to be minor in determining significance under criterion C and, therefore, may not be a threat to the water engineering properties in the Project.

CONTRIBUTING AND NONCONTRIBUTING PROPERTIES

1942

Dams

Period of Significance: The period of significance for dams in the Newlands Project begins in 1903 with the start of construction on Derby Diversion Dam and ends in 1926 with the transfer of the Project to the TCID.

Significance: The significance of dams in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. They are core components of the Newlands Project and provide storage and diversion structures for water distribution, regulation, and flood control throughout the region. Dams are contributing resources when they are strongly associated with the Newlands Project and with period of significance or have exceptional significance, retain integrity, and play an important role in the management of water flowing through the Newlands Project.

Diversion Dams divert water for distribution. They are considered to be important in the Newlands water distribution network when they have exceptional size. The size of diversion dams is measured by water diversion rates in cubic feet per second (cfs), which varies from 1,950 cfs (Carson River Diversion Dam) to 38.8 cfs (Sagouspe Dam) in the Newlands Project. Diversion dams with exceptional size are considered to be contributing resources if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Project. Derby Diversion Dam and Carson River Diversion Dam are both considered to be contributing resources and are currently listed on the National Register.

Storage Dams store and regulate water. They are considered to be contributing if they have sufficient capacity to be important in regulating water fluctuations, if they meet the criteria of integrity, fall within the period of significance, and are strongly associated with the project. Lake Tahoe Dam and Lahontan Dam are both considered to be contributing and are currently listed on the National Register. They are considered to be important because of their exceptionally large water capacity (732,000-314,000 acre-feet) and key role in providing adequate water to the project during times of drought. Boca Dam, although currently listed on the National Register, is considered to be noncontributing because it is not strongly associated with the Newlands Project. The size of the other dams in the project is quite small and varies from 17,000 acre-feet to 1,000 acre-feet. Stillwater Point Dam, Ole's Pond Dam, and Harmon Pasture Dam are considered to be noncontributing resources not only because of their small size but also because they fall outside the period of significance.

Integrity: Certainly, dams must have integrity of location to be eligible for listing on the National Register. Assessing their overall integrity, however, must reflect the fact that the Newlands Project is an ongoing dynamic system with many components that have been replaced, remodeled, or repaired over the years. For this reason, the elements of design, workmanship, and materials should be considered in broad perspective (cf. Pfaff 1998: 48). The integrity of a dam is retained, for example, even if needle valves or gates have been replaced as long as the original design, use, or character of the dam is not significantly changed. In the same sense, a dam's integrity of setting is retained if the character of the original setting is still apparent without significant intrusions. A dam also will retain integrity of feeling and association if the other elements of integrity are intact.

Water Conveyance Systems

Period of Significance: The period of significance for water conveyance structures in the Newlands Project begins with the start of construction of the Truckee Canal in 1903 and ends in 1926 with the transfer of the Project to the TCID.

Significance: The significance of the water conveyance structures in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. Water conveyance structures are important as key components in the Newlands Project for transporting water from the Truckee River and Carson River to storage dams and from there to the farms. They are considered to be contributing resources when they are associated with the period of significance or have exceptional significance, retain integrity, and play an important role in the management of water flowing through the Newlands Project.

Main Canals are the primary arteries of the Newlands Project water distribution network. They are considered to be important water conveyance structures and, therefore, are contributing resources if they meet the criteria of integrity and fall within their period of significance. They all have lengths ranging from a little over two miles (N-line Canal) to 32 miles (The Truckee Canal) and cross-sections ranging from 60 square feet (T-Canal) to 260 square feet (Truckee Canal). They have diversion capacities (water flow rates) ranging from 450 cubic feet per second (T-Canal) to 1,500 cubic feet per second (Truckee Canal, V-Canal). Of the main canals, the Truckee Canal, the V-Canal, and the T-Canal were the first to be constructed and are currently listed on the National Register. The other main canals that contribute to the Newlands Project district include the A-line, the D-line, the E-line, the G-line, the L-line, the N-line, the R-line, and the S-line.

Lateral Canals and their branches (i.e., sub-lateral or sub-sub-lateral) are the secondary arteries of the Newlands Project water distribution network. Only lateral canals with exceptional size and importance are considered to be important water conveyance structures. Exceptional size is measured by length, cross-section, and cubic feet per second (cfs). To have exceptional size, a lateral canal or branch must be at least one mile in length and have a cross-section of at least 60 square feet. The length of laterals in the Project varies from 250 feet to a little over eight and a half miles. Of these, 126 are at least one mile long (Appendix). Such large size lateral canals are considered to be contributing only if they also have exceptional importance, which is measured by the number of users. To have exceptional importance, a lateral canal must be associated with three or more users. Lateral canals that have been determined to have exceptional size and importance are considered to be contributing resources if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. Sub-lateral canals and their branches (e.g., sub-sub-laterals) are not considered to be contributing resources.

Drains are considered to be important water conveyance structures only if they have exceptional size and importance. Determining what drains are contributing is helped by a drain classification system used by the Newlands Project at least as early as 1920 that defined three categories based on size and relative importance to the drainage system (Reclamation Service map, January 23, 1920). In this system, Class 1 or "deep" drains are the largest and most important, followed by Class 2 and then by Class 3, the least important. The typical size of Class 1 deep drains constructed between 1921 and 1928 is 10 feet deep and nine feet wide at the bottom (Simonds 1996: 20, Townley 1998: 47). Deep drains constructed during the CCC period between 1936 and 1942 followed the same pattern. All Class 1 deep drains are considered to be important water conveyance structures if they have a length of at least one mile and, therefore, are contributing resources if they retain integrity, fall within the period of significance, and are strongly associated with the Newlands Project. The length of drains in the Project varies from 299 feet (Carson Lake 1 BR-2) to about 12 miles (L Deep Drain, Lower Diagonal Deep Drain). Of these, 120 drains are one mile or more in length and, therefore, are considered to be contributing resources (Appendix). All Class 2 and 3 "surface" drains in the Newlands Project are considered to be noncontributing resources.

Regulating, Diversion, and Protective Structures control the flow of water through the canals and drains. They are considered to be important when they play a major role in water regulation or when they are unique representations of an engineering or architectural type or pattern. All canal headworks are important and, therefore, are considered to be contributing resources if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. Wasteworks are considered to be contributing resources only as good examples of this type of structure and if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. Turnouts, drops, and checks in the Newlands Project are considered to be contributing resources only as good examples of a distinctive type of water control structure and if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. They are considered to be noncontributing if they are associated with sub-laterals or their branches.

Integrity: Like other components of the Newlands Project as an ongoing system, the water conveyance structures have been repaired or modified since their construction and after their period of significance. The alterations, however, do not necessarily mean loss of integrity if the location (alignment) is the same and the overall design, setting, and feeling are retained (cf. Pfaff 1998: 50). Abandoned water conveyance structures may still be eligible if they are visible, maintain their original alignment, and still convey their historical association with the Newlands

Project. Altering the canal or drain by adding pipe and filling in the structure, however, destroys the historical association but still retains the historical use of the structure.

The integrity of water conveyance structures and associated features varies with how much of their original use and design is still intact. Supernowicz (1990) developed integrity criteria for water conveyance structures on the El Dorado National Forest that are applicable to the Newlands Project as well. They include the extent to which the structure has been altered, the extent to which the structure has retained its original form (morphology, profile, and design elements), and the extent to which the structure has retained associated features such as turnouts, checks, drops, and wasteways. At one end of the integrity scale, the water conveyance structures with the highest integrity have undergone no recent alterations or significant erosion. They also have retained their original form and have retained all of the features, which also retain their original form and appearance, associated with either the design or original use of the structure. At the other end of the scale, the structures with the lowest integrity have undergone more than 50 percent alteration and have lost all associated features. Recent concrete lining of unlined canals is not considered to be an important loss of integrity if it doesn't significantly change the overall morphology or appearance of the structure.

Power Plants

Period of Significance: The period of significance begins with the construction of the power plant at the Lahontan Dam in 1911 and ends in 1926 with the transfer of the Project to the TCID.

Significance: The significance of power plants in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. Power plants are important as key components in the Newlands Project for generating electric power. They are considered to be contributing resources when they are associated with the period of significance or have exceptional significance, retain integrity, and play an important role in electric power generation. Electric power was considered to be one of the secondary benefits of the Newlands Project. Hydroelectric power generated from the fall of the Truckee Canal at the site of Lahontan Dam was used as a source of power during the construction of the dam between 1911 and 1915. The Lahontan plant, for example, powered what may have been the first electric shovel to be used on a construction site. After its completion in 1915, the Lahontan power plant used both the penstock from the Truckee Canal and the penstock from the outlet tower of the dam to generate hydroelectric power.

Integrity: The integrity of power plants must be judged as an ongoing system that needs periodic maintenance, repair, and replacement of parts. Retention of the overall design, however, is important (cf. Pfaff 1998: 58). The Lahontan power plant, for example, increased the capacity of its three generators to 640 kilowatts each between 1947 and 1954 without significantly changing the design of the plant. The TCID installed two new 1,000 kilowatt diesel powered generators next to the Lahontan power plant in 1949 (USDI Water and Power Resources Service 1981: 687). Both of these generators, however, were removed about five years ago.

Pumping Plants

Period of Significance: 1924-1926

Significance: The significance of pumping plants in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. Pumping plants make possible the transfer of water into otherwise inaccessible areas. They are considered to be contributing resources when they are associated with the period of significance or have exceptional significance, retain integrity, and play an important role in the management of water flowing through the Newlands Project.

Integrity: The pumping plants no longer exist.

CONCLUSIONS

The resources that contribute to the National Register eligibility of the Newlands Reclamation Project convey the key components of the project's water engineering network during its' period of significance from 1906 until 1926. Contributing resources come from the property types of dams, water conveyance structures, power plants, and pumping stations. The significance of contributing resources is derived mostly from criteria A and C. Many of the resources in the project contribute under criterion A because of their strong association with specific historical events, themes, and patterns. They include, for example, dams and canals that convey the characteristics of the first federally funded irrigation project in the United States. The resources that contribute in this way must be (1) associated with the original construction of the Newlands Project, (2) a "core" water engineering component (e.g., large storage dam or a main canal), and (3) under federal management. Drains are considered to be contributing under criterion A if they are associated with the early period of drain construction from 1921 to 1926 as a physical expression of the engineering response to the drainage problems that developed early in the operation of the project. To be considered as contributing under criterion A, historic properties in the Newlands Project must have retained integrity of feeling, setting, design, location, and association. Both feeling and setting are being threatened by urbanization and by military activities at the Fallon Naval Air Station.

Some resources in the Project are considered to be contributing under criterion C is they are good examples of distinctive architectural or engineering patterns, styles, types, or periods. Dams, for example, are considered to be contributing under criterion C if they are good examples of water storage or diversion structures in the Project at the time of its construction. Criterion C requires that historic properties retain integrity of design, workmanship, and materials to be contributing.

Finally, archaeological or other resources in the Project are considered to be contributing under criterion D if they are a good source of information about the workers who lived in the early construction camps or about environmental changes brought about by the Project. To be considered contributing under this criterion, historic properties in the Newlands Project must have retained integrity of association, design, and location.

What remains to be done in the future? As discussed in the introduction, this report does not consider several themes that may be important in considering the significance of some cultural resources in the Newlands Project. In particular, these themes include the CCC, historic landscapes, farming and agricultural life, migrants, and work camps (e.g., the site of the construction camp of Lahontan City). These themes should be developed in future guidance documents for management of cultural resources in the Newlands Project National Register District.

Specific recommendations, therefore, are to develop the following thematic contexts:

- CCC's role in the operation, maintenance, and development of the Newlands Project.
- "Transforming Environments" that would consider, in particular, the historic landscapes associated with agriculture in the Newlands Project.
- "Peopling Places" that would focus upon the migrants who moved to and settled in the Newlands Project.
- "Workers and Work Culture" that would focus upon, for example, the Newlands Project construction camps, CCC camps, and farmers.
- "Expanding Science and Technology" is a theme that would consider, in particular, the development of technological innovations and applications in irrigation farming practices in the Newlands Project. The Reclamation Service, for example, established an experimental farm in 1906 "to test cultivation methods and seed strains" (Townley 1998: 28). Local newspapers published the results of such experiments so that farmers could take advantage of the information. Later, the University of Nevada, Reno, took over the experimental farm as part of its extension service. Experimental farms also are associated with other federal reclamation projects.

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Appendix 1

Drains and Laterals from the Newlands Project:
Contributing and Noncontributing Elements to the
National Register of Historic Places District

Newlands Project Canals and Laterals from Fallon and Fernley, Nevada and Their National Register Contributing Status							
Main Canal	**Lateral**	**Date**	**Length**	**Cross-Section**	**Volume (CFS)**	**Integrity**	**NRHP Contributing Element**
A-Line	--	pre-1926	>1 mile			yes	**yes**
	A1	pre-1926	>1 mile			yes	**yes**
	A2	pre-1926	>1 mile			yes	**yes**
	A3	pre-1926				yes	no
	A4	pre-1926	>1 mile			yes	**yes**
	A5	pre-1926	>1 mile			yes	**yes**
	A5-1	pre-1926	>1 mile			yes	**yes**
	A6	pre-1926	>1 mile			yes	**yes**
	A7	pre-1926				yes	no
	A8	pre-1926				yes	no
	A9	pre-1926				yes	no
	A9-3	pre-1926	>1 mile			yes	**yes**
	A9-4	pre-1926	>1 mile			yes	**yes**
	A9-5	pre-1926	>1 mile			yes	**yes**
	A10 (G-line)	pre-1926	>1 mile			yes	**yes**
	A11	pre-1926				yes	no
	A12	pre-1926	>1 mile			yes	**yes**
	A13	pre-1926				yes	no
	A14	pre-1926				yes	no
	A15	pre-1926	>1 mile			yes	**yes**
	A16	pre-1926				yes	no
	A17	pre-1926				yes	no
	A18	pre-1926	>1 mile			yes	**yes**
	A19	pre-1926	>1 mile			yes	**yes**
	A19-1	pre-1926	>1 mile			yes	**yes**
	A20	pre-1926				no	no
	A21	pre-1926	>1 mile			no	no
D-Line	--	pre-1926	>1 mile			yes	**yes**
	D1	pre-1926	>1 mile			yes	**yes**
	D2	pre-1926	>1 mile			yes	**yes**
	D3	pre-1926	>1 mile			no	no
	D4	pre-1926	>1 mile			unknown	**yes**
	D5	pre-1926	>1 mile			unknown	**yes**
E-Line	--	pre-1926	>1 mile			yes	**yes**
	E1	pre-1926	>1 mile			yes	**yes**
	E2	pre-1926				unknown	no
	E3	pre-1926	>1 mile			unknown	**yes**
	E4	pre-1926	>1 mile			unknown	**yes**
	E5	pre-1926	>1 mile			unknown	**yes**
G-Line	--	pre-1926	>1 mile			yes	**yes**
	G1	pre-1926				yes	no
	G2	pre-1926				yes	no
	G3	pre-1926	>1 mile			no	no
	G4	pre-1926	>1 mile			yes	**yes**
	G5	pre-1926	>1 mile			yes	**yes**

Main Canal	Lateral	Date	Length	Cross-Section	Volume (CFS)	Integrity	NRHP Contributing Element
	G6	pre-1926				unknown	no
	G7	pre-1926	>1 mile			unknown	**yes**
L-Line	--	pre-1926	>1 mile			yes	**yes**
	L1	pre-1926	>1 mile			yes	**yes**
	L1-1	pre-1926	>1 mile			unknown	**yes**
	L1-4	pre-1926	>1 mile			unknown	**yes**
	L1-7	pre-1926	>1 mile			unknown	**yes**
	L1-8	pre-1926	>1 mile			unknown	**yes**
	L1-10	pre-1926	>1 mile			unknown	**yes**
	L2	pre-1926				yes	no
	L3	pre-1926	>1 mile			no	no
	L4	pre-1926	>1 mile			yes	**yes**
	L5	pre-1926				yes	no
	L6	pre-1926	>1 mile			yes	**yes**
	L7	pre-1926				yes	no
	L8	pre-1926	>1 mile			yes	**yes**
	L8-2	pre-1926	>1 mile			unknown	**yes**
	L8-3	pre-1926	>1 mile			unknown	**yes**
	L8-4	pre-1926	>1 mile			unknown	**yes**
	L9	pre-1926	>1 mile			yes	**yes**
	L10	pre-1926	>1 mile			yes	**yes**
	L10-1	pre-1926	>1 mile			unknown	**yes**
	L11	pre-1926				yes	no
	L12	pre-1926	>1 mile			yes	**yes**
N-Line	--	pre-1926	>1 mile			yes	**yes**
	N1	pre-1926				yes	no
	N2	pre-1926				yes	no
	N3	pre-1926	>1 mile			yes?	**yes**
	N4	pre-1926				no	no
	N5	pre-1926				yes	no
	N6	pre-1926				yes	no
	N7	pre-1926				yes	no
	N8	pre-1926				yes?	no
	N9	pre-1926				yes?	no
	N10	pre-1926				yes	no
	N11	pre-1926				no	no
	N12	pre-1926				no	no
	N13	pre-1926				unknown	no
	N14	pre-1926				unknown	no
	N15	pre-1926				unknown	no
	N16	pre-1926				unknown	no
	N17	pre-1926				unknown	no
R-Line	--	pre-1926				yes	**yes**
	R1	pre-1926				yes	no
	R2	pre-1926	>1 mile			yes	**yes**
	R3	pre-1926				yes	no
	R4	pre-1926	>1 mile			yes	**yes**
	R5	pre-1926				yes	no

Main Canal	Lateral	Date	Length	Cross-Section	Volume (CFS)	Integrity	NRHP Contributing Element
	R6	pre-1926	>1 mile			yes	**yes**
	R7	pre-1926	>1 mile			unknown	**yes**
	R8	pre-1926				unknown	no
	R9	pre-1926	>1 mile			unknown	**yes**
	R10	pre-1926				unknown	no
	R11	pre-1926	>1 mile			unknown	**yes**
	R11-1	pre-1926	>1 mile			unknown	**yes**
S-Line	--	pre-1926	>1 mile			yes	**yes**
	S1	pre-1926				yes	**yes**
	S2	pre-1926	>1 mile			yes	**yes**
	S3	pre-1926				yes	no
	S4	pre-1926	>1 mile			yes	**yes**
	S5	pre-1926	>1 mile			yes	**yes**
	S6	pre-1926	>1 mile			yes	**yes**
	S6-4	pre-1926	>1 mile			unknown	**yes**
	S6-6	pre-1926	>1 mile			unknown	**yes**
	S7	pre-1926	>1 mile			yes	**yes**
	S7-3	pre-1926	>1 mile			unknown	**yes**
	S8	pre-1926	>1 mile			yes	**yes**
	S9	pre-1926				yes	no
	S10	pre-1926	>1 mile			yes	**yes**
	S11	pre-1926				yes	no
	S12	pre-1926				yes	no
	S13	pre-1926	>1 mile			yes	**yes**
	S14	pre-1926				yes?	no
	S15	pre-1926				yes	no
	S16	pre-1926				yes	no
	S17	pre-1926	>1 mile			yes	**yes**
	S18	pre-1926				yes	no
	S19	pre-1926	>1 mile			no	**yes**
	S20	pre-1926				no	no
	S21	pre-1926				yes	no
	S22	pre-1926	>1 mile			yes	**yes**
	S23	pre-1926				yes	no
	S24	pre-1926				yes	no
	S25	pre-1926				yes	no
T-Line	--	pre-1926				yes	**yes**
	T1	pre-1926				yes	no
	T2	pre-1926				yes	no
	T3	pre-1926				no	no
	T4	pre-1926	>1 mile			yes	**yes**
	T5	pre-1926	>1 mile			yes	**yes**
	T6	pre-1926	>1 mile			yes	**yes**
	T7	pre-1926	>1 mile			yes	**yes**
	T8	pre-1926				yes	no
	T9	pre-1926				yes	no
	T10	pre-1926				no	no
	T11	pre-1926	>1 mile			yes	**yes**

Main Canal	Lateral	Date	Length	Cross-Section	Volume (CFS)	Integrity	NRHP Contributing Element
	T12	pre-1926				yes	no
	T13	pre-1926	>1 mile			yes	**yes**
	T14	pre-1926				yes	no
	T15	pre-1926				yes	no
	T16	pre-1926	>1 mile			yes	**yes**
	T17	pre-1926				no	no
	T18	pre-1926				yes	no
TruckeeCanal	--	pre-1926	>1 mile			yes	**yes**
	TC1	pre-1926				unknown	no
	TC2	pre-1926	>1 mile			unknown	**yes**
	TC3	pre-1926				unknown	no
	TC4	pre-1926	>1 mile			unknown	**yes**
	TC5	pre-1926	>1 mile			unknown	**yes**
	TC6	pre-1926	>1 mile			unknown	**yes**
	TC7	pre-1926				unknown	no
	TC8	pre-1926				unknown	no
	TC9	pre-1926				unknown	no
	TC10	pre-1926				unknown	no
	TC11	pre-1926				unknown	no
	TC12	pre-1926	>1 mile			unknown	**yes**
	TC12-2	pre-1926	>1 mile			unknown	**yes**
	TC13	pre-1926	>1 mile			unknown	**yes**
	TC13-1	pre-1926	>1 mile			unknown	**yes**
V-Line	--	pre-1926	>1 mile			yes	**yes**
	V1	pre-1926				yes	no
	V2	pre-1926				yes	no
	V3	pre-1926				yes	no
	V4	pre-1926				yes	no
	V5	pre-1926				yes	no
	V6	pre-1926				yes	no
	V7	pre-1926				yes	no
	V8	pre-1926				yes	no
	V9	pre-1926				no	no
	V10	pre-1926				yes	no
	V11	pre-1926				yes	no
	V12	pre-1926				unknown	no

Newlands Project Drainage Features and Their Contributing Status Found in the Vicinity of Fallon, Navada						
Drain	**Sub-Drain**	**Canal Affiliations**	**Length**	**Date**	**Integrity**	**NRHP Contributing Element**
Allyn		L1		pre-1926	yes	no
B		A1		pre-1926	yes	no
Bria		N17, end of N-Line		pre-1926	yes	no
Buerer		S11,13		pre-1926	yes	no
C1B		L4		pre-1926	yes	no
C1X		L4		pre-1926	yes	no
C3X		L1		pre-1926	yes	no
C4A	Br.1	L1		pre-1926	yes	no
C4B		L1, end of L1		pre-1926	yes	no
Carson Lake		A12,15,16	>1 mile	pre-1926	yes	**yes**
Carson Lake 1	deep	A15; G1,4	>1 mile	pre-1926	yes	**yes**
Carson Lake 1-A	Br.1, Deep, Ext.	A9; G1,2		pre-1926	yes	no
Carson Lake 3	Br.1	A15		pre-1926	yes	no
Casebolt		S19, lower S-Line		pre-1926	yes	no
City Ditch		L2		pre-1926	yes	no
Clevenger		A9		pre-1926	yes	no
Cline		A15		pre-1926	yes	no
Conley	Br.1	A16		pre-1926	yes	no
Coverston		A15		pre-1926	yes	no
D1A		L8		pre-1926	yes	no
D3		L8	>1 mile	pre-1926	yes	**yes**
D3X		L8		pre-1926	yes	no
D5A		L8		pre-1926	yes	no
D5B		end of L8	>1 mile	pre-1926	yes	**yes**
D5X		L8		pre-1926	yes	no
Dalton		G3,5		pre-1926	yes	no
Danielson		S6		pre-1926	yes	no
Dean		V3		pre-1926	yes	no
Dearmond		S24,25		pre-1926	yes	no
Dodge		S17		pre-1926	yes	no
Douglass Deep		G1, Upper G-Line	>1 mile	pre-1926	yes	**yes**
Downs		A16,17	>1 mile	pre-1926	yes	**yes**
Droz-Dodge		S6		pre-1926	yes	no
E2A		L10		pre-1926	yes	no
E3A		L10	>1 mile	pre-1926	yes	**yes**
E3B		L10	>1 mile	pre-1926	yes	**yes**
E4A		L10	>1 mile	pre-1926	yes	**yes**
E4X		L8	>1 mile	pre-1926	yes	**yes**
E5X		L8		pre-1926	yes	no

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
East Ditch		end of L12, Carson Lake Pasture		pre-1926	yes	no
East Lee		A19,21, end of A-Line	>1 mile	pre-1926	yes	**yes**
Emigrant		north of T4,5	>1 mile	pre-1926	yes	**yes**
Erb		end of T-Line	>1 mile	pre-1926	yes	**yes**
Evans		S6		pre-1926	yes	no
F1		D2	>1 mile	pre-1926	yes	**yes**
F1M		D2		pre-1926	yes	no
F2		D1,2	>1 mile	pre-1926	yes	**yes**
F3		A9; end of E1		pre-1926	yes	no
F3B		L10		pre-1926	yes	no
Fernley	1, A, A1-BR4	TC1 through TC10	>1 mile	pre-1926	yes	**yes**
Fowler		A15		pre-1926	yes	no
Freeman-Sears		S13		pre-1926	yes	no
G Line		G2	>1 mile	pre-1926	yes	**yes**
G4		G1		pre-1926	yes	no
Getto		T14,(16?)		pre-1926	yes	no
GF		G5	>1 mile	pre-1926	yes	**yes**
GH		G3,5		pre-1926	yes	no
Gott		S16		pre-1926	yes	no
Grimes		S2		pre-1926	yes	no
Grimes Slough	ext	A20,21; L12	>1 mile	pre-1926	unknown	**yes**
Gummow		A9; E1	>1 mile	pre-1926	yes	**yes**
Gummow 4		end of E1		pre-1926	yes	no
Hagen	Br.1	V7		pre-1926	yes	no
Harmon	Ext., Deep	R1; S6,8,12,14, end of S-Line		pre-1926	yes	no
Harmon 1	deep	S6,7,10,11	>1 mile	pre-1926	yes	**yes**
Harmon 2	Br.1, Deep	S6,8,12	>1 mile	pre-1926	yes	**yes**
Harmon 9	Ext.	S6		pre-1926	yes	no
Harmon/S2 Spill		S-Line, Harmon Reservoir		pre-1926	yes	no
HarmonInlet(S1B)	—	—		pre-1926	yes	no
Hazen		TC11,12	>1 mile	pre-1926	yes	**yes**
Hazen 2		TC12		pre-1926	yes	no
Heinze		T11		pre-1926	yes	no
Holmes	BR1, deep	G3,5	>1 mile	pre-1926	yes	**yes**
Humphrey's		S17		pre-1926	yes	no
I-A	Br.1, Ext.	A9		pre-1926	yes	no
Inglis		V2		pre-1926	yes	no
J1	BR4, deep	A19,20,21, end of A-Line; L8,12	>1 mile	pre-1926	unknown	**yes**
J1E		A21		pre-1926	yes	no

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
Javis	Ext.	A11		pre-1926	yes	no
J. B. Eason		L8		pre-1926	yes	no
Jones		end of V1		pre-1926	yes	no
Keddie		S1; end of V-Line	>1 mile	pre-1926	yes	**yes**
Kennedy	Diversion	G2		pre-1926	yes	no
Kent		S22, end of S-Line	>1 mile	pre-1926	yes	**yes**
Kent Lake	deep	R9; S17,22	>1 mile	pre-1926	yes	**yes**
L	deep	L1,4; V6,8	>1 mile	pre-1926	yes	**yes**
L1		L8	>1 mile	pre-1926	yes	**yes**
L2	BR1, deep	L1	>1 mile	pre-1926	yes	**yes**
L3	Br.1	L5, 8		pre-1926	yes	no
L4		L1		pre-1926	yes	no
L5		L1		pre-1926	yes	no
L6		L1		pre-1926	yes	no
L8		L8	>1 mile	pre-1926	yes	**yes**
L9		L4		pre-1926	yes	no
L12		L4	>1 mile	pre-1926	yes	**yes**
Laist		S6		pre-1926	yes	no
Lambright		A4		pre-1926	yes	no
Law		N8,9		pre-1926	unknown	no
LD		L1,2,4,5; V11	>1 mile	pre-1926	yes	**yes**
LE		L10		pre-1926	yes	no
Lower Diagonal	deep	L8,12	>1 mile	pre-1926	yes	**yes**
Lower Diagonal 1	Br.1,2,6-8	L8,10		pre-1926	yes	no
Lower Diagonal 2		L8		pre-1926	yes	no
Lower Hazen	Br.	TC11,12	>1 mile	pre-1926	yes	**yes**
Lower Soda Lake	Br.1,3	T13,15,16,18	>1 mile	pre-1926	yes	**yes**
Malm		A9	>1 mile	pre-1926	yes	**yes**
Mauz		T11		pre-1926	yes	no
McCuskey		end of S-Line		pre-1926	yes	no
McLean		N9,10		pre-1926	yes	no
Merling		S14,15		pre-1926	unknown	no
Miller Ditch		Carson Lake Past.		pre-1926	yes	no
Mills		V5; A1	>1 mile	pre-1926	yes	**yes**
Morgan		N2		pre-1926	yes	no
Mussi		end of T-Line	>1 mile	pre-1926	yes	**yes**
Mussi 1		end of T-Line		pre-1926	yes	no
Mussi 2		end of T-Line		pre-1926	yes	no
New River	BR, ext BR1	L2,6,7,9,11; S6; V7,9,11	>1 mile	pre-1926	yes	**yes**
New River 1		L6; S3,4	>1 mile	pre-1926	yes	**yes**
New Swope		S18	>1 mile	pre-1926	yes	**yes**
Norcutt		G4	>1 mile	pre-1926	yes	**yes**

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
Norton		S19		pre-1926	yes	no
Nygren		R2,3		pre-1926	yes	no
Oar		N2,5		pre-1926	yes	no
Paiute (vs. Upper Paiute)	Br.1, 3, Ext., Deep	S20,21,22,24,25	>1 mile	pre-1926	yes	**yes**
Patrick		S17,22	>1 mile	pre-1926	yes	**yes**
Petree		N1		pre-1926	yes	no
Phillips		T12	>1 mile	pre-1926	yes	**yes**
Pierson		L12		pre-1926	unknown	no
Pierson Ditch		A19		pre-1926	yes	no
Pirtle	Br.1	N6		pre-1926	yes	no
Piute (see Paiute)	—	—		pre-1926	unknown	no
Ponte		end of T-Line	>1 mile	pre-1926	yes	**yes**
Ranch		S6		pre-1926	yes	no
Renfro		A12; Upper G-Line		pre-1926	yes	no
Rice Ditch		Carson Lake Pasture		pre-1926	yes	no
S		S7,10		pre-1926	yes	no
S1		R4,6; S6,17	>1 mile	pre-1926	yes	**yes**
S11		R4,6	>1 mile	pre-1926	yes	**yes**
S1A		S6		pre-1926	yes	no
S1B		S6	>1 mile	pre-1926	yes	**yes**
S1N		S6		pre-1926	yes	no
S1O1		S6		pre-1926	yes	no
S2	Ext.	S17	>1 mile	pre-1926	yes	**yes**
S2 Wasteway	Br.1, Ext.	S22		pre-1926	yes	no
S2 Spill (Harmon Spill)	—	—		pre-1926	yes	no
S2C		S17,18	>1 mile	pre-1926	yes	**yes**
S2G		S6		pre-1926	yes	no
S5A		R2,9	>1 mile	pre-1926	yes	**yes**
S6	Br.1	R5		pre-1926	yes	no
S7B		R6,7		pre-1926	yes	no
Scrimsherwood		N3,4		pre-1926	unknown	no
SD		S3	>1 mile	pre-1926	yes	**yes**
Shaffner		D2	>1 mile	pre-1926	yes	**yes**
Sheckler	deep	A3; V1,4	>1 mile	pre-1926	yes	**yes**
Sheckler 1		A1; V4,5	>1 mile	pre-1926	yes	**yes**
Sheckler 2	Ext.	V4, A1		pre-1926	yes	no
Show		S20		pre-1926	yes	no
Shuey		T12, end of N-Line		pre-1926	yes	no
Sitton	Ext.	A12; Upper G-Line	>1 mile	pre-1926	yes	**yes**
South Fork	Br.1	A8	>1 mile	pre-1926	yes	**yes**

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
South Upper Soda Lake		T12		pre-1926	yes	no
Stergeon		T6,7	>1 mile	pre-1926	yes	**yes**
Steve		R6,7		pre-1926	yes	no
Stillwater Point Reservoir		S19	>1 mile	pre-1926	yes	**yes**
Stillwater Slough	Br.1	end of S-Line	>1 mile	pre-1926	yes	**yes**
Stillwater Slough Cutoff	Br.1	end of S-Line		pre-1926	yes	no
Thoma		L1	>1 mile	pre-1926	yes	**yes**
Thompson		S14		pre-1926	yes	no
Towle		V8		pre-1926	yes	no
UD		T11		pre-1926	yes	no
U1D	Br.1	T7,9,11	>1 mile	pre-1926	yes	**yes**
UM		T15,17	>1 mile	pre-1926	unknown	**yes**
Upper Diagonal	deep	L1	>1 mile	pre-1926	yes	**yes**
Upper Diagonal 1	Br.2	L1		pre-1926	yes	no
Upper Diagonal 2		A11; L1	>1 mile	pre-1926	yes	**yes**
Upper Mussi		end of T-Line		pre-1926	yes	no
Upper Paiute (vs. Paiute)	Br.1, Deep	R2,3,5,9; S7,17	>1 mile	pre-1926	yes	**yes**
Upper Paiute 1	Br.4	R9		pre-1926	yes	no
Upper Paiute 2		R9; S17		pre-1926	yes	no
Upper Soda Lake	deep	N11,12; T11,13	>1 mile	pre-1926	unknown	**yes**
Upper Soda Lake1		T8,10	>1 mile	pre-1926	unknown	**yes**
Upper West Side	deep	A2,4; V1	>1 mile	pre-1926	yes	**yes**
Upper WestSide 2	Br.2	A4,5		pre-1926	yes	no
Vencil		D1,3	>1 mile	pre-1926	unknown	**yes**
Viera		S22		pre-1926	yes	no
Wade		end of T13	>1 mile	pre-1926	yes	**yes**
Weishaupt	Br.1	S22		pre-1926	yes	no
W. Carson Lake		G3,4,5		pre-1926	yes	no
West Lee		A15,18		pre-1926	yes	no
Worden		R1		pre-1926	yes	no
Workman		T5,6		pre-1926	yes	no
Yarbrough		A18	>1 mile	pre-1926	yes	**yes**
Yarbrough 1		A18		pre-1926	yes	no
York Ditch		Carson Lake Pasture		pre-1926	yes	no

NEWLANDS PROJECT
NEVADA

A MULTIPLE PROPERTY DOCUMENTATION FORM

U.S. Department of the Interior
Bureau of Reclamation
December 2002

NPS Form 10-900-b OMB No. 1024-0018
(March 1992)

United States Department of the Interior
National Park Service

National Register of Historic Places
Multiple Property Documentation Form

This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in How to Complete the Multiple Property Documentation Form (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

____ New Submission __X__ Amended Submission (replaces Newlands Reclamation Thematic Resources listed 3/81)

A. Name of Multiple Property Listing

Newlands Project

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

- Planning and Construction of Major Features: 1902-1915
- Continued Construction: Drainage Facilities and Project Repairs: 1916-1928
- Project Settlement and Economic Development: 1904-1929
- Civilian Conservation Corps Contributions: 1933-42
- Construction of Additional Storage and Diversion Facilities: 1935-45

The geographical area for all contexts is the same: Placer County, California and Churchill, Storey, Washoe, and Lyon Counties, Nevada

C. Form Prepared by

Name/title: Christine Pfaff, Historian, Bureau of Reclamation

Street & number: P.O. Box 25007 Telephone: 303-445-2712

City or town: Denver State:CO Zip code: 80225

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. (___ See continuation sheet for additional comments.)

3-25-03

Bureau of Reclamation, Federal Preservation Officer
Thomas Lincoln

Date

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

5/12/03

Signature of the Keeper

Date

Table of Contents for Written Narrative

Provide the following information on continuation sheets. Cite the letter and the title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets in How to Complete the Multiple Property Documentation Form (National Register Bulletin 16B). Fill in page numbers for each section in the space below.

Section **Page Numbers**

E. Statement of Historic Contexts: 4
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F. Associated Property Types: 50
(Provide description, significance, and registration requirements.)

G. Geographical Data: 76

H. Summary of Identification and Evaluation Methods 77
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I. Major Bibliographical References: 79
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J. Figures of the Newlands Project: 84

E. STATEMENT OF HISTORIC CONTEXTS: NEWLANDS PROJECT

INTRODUCTION

The Newlands Project first and foremost marks the beginning of direct Federal involvement in promoting settlement of the arid American West through the development of irrigated agriculture. With passage of the Reclamation Act of 1902, the Federal government assumed a major role in designing and constructing large-scale irrigation projects throughout the West. As one of the first five projects authorized and built under the Reclamation Act, the Newlands Project (originally known as the Truckee-Carson Project) has achieved national significance. A network of water storage, diversion, and conveyance structures provide water for irrigating about 73,000 acres of farmland in an area that receives less than 4.5 inches of annual precipitation; additionally, the project generates hydroelectric power and controls flooding. Contributing to the project's significance is its association with the primary sponsor of the Reclamation Act, Nevada Congressman, later Senator, Francis G. Newlands. The legislation popularly known as the Reclamation Act originally bore his name.

The significance of the Newlands Project was initially recognized in 1978 with the listing in the National Register of Derby Diversion Dam, the first feature to be constructed on the project. This was followed in 1981 with the listing of the Newlands Project as a thematic resources nomination. Two structures associated with the project were listed at that time: Carson River Diversion Dam, and Lahontan Dam and Power Station. Also proposed for listing but rejected due to additional information needs were: Boca Dam, Lake Tahoe Dam, "T" Line Canal, Truckee Canal, "V" Line Canal, and the "V" Line Canal Powerplant.[1] Due to the ambiguity and lack of thorough documentation of the 1981 thematic resources nomination, Reclamation is submitting this multiple property documentation form to supersede the earlier one. The three properties already listed will maintain their status and be absorbed into the new nomination.

[1] There are several different spelling conventions for the lettered canals. Because quotation marks appear to be used most often in the historical record, they will be applied in this document.

This new form will also serve as the basis for evaluating the National Register eligibility of other Newlands Project-related properties.

National Significance of Newlands Project

As stated above, the Newlands Project has achieved national significance as one of the first five projects authorized and built under the Reclamation Act. Contributing to its significance, and unique to the project, is its association with the primary sponsor of the Reclamation Act, Francis G. Newlands. An additional factor establishing national significance for the project is that the first design specification for a Reclamation feature was assigned to Derby Dam. Undoubtedly, this designation along with a desire to recognize and maintain Newlands' support for the new agency, led Reclamation officials to commonly refer to the Newlands Project as the "first" Reclamation Project, setting it apart from the other four.

The Newlands Project, along with the other four initial Reclamation projects, signaled the entrance of the Federal government into the construction of irrigation projects throughout the West. Private and state efforts to build extensive water storage and delivery systems had largely failed due to lack of sufficient financial resources and technical expertise. With the passage of the Reclamation Act of 1902 and the selection of the first five Reclamation projects, the Federal government initiated a direct and massive investment in the development of Western agriculture. The scale and complexity of irrigation systems took on new dimensions as did the application of engineering technology. The first five projects represented an experimental phase for Reclamation in the design, planning, and construction of irrigation features. With the limitation of project farms to no more than 160 acres, the Reclamation program also introduced an underlying philosophy of "homemaking" in support of the agrarian Jeffersonian ideal. Reclamation projects were intended to allow small family farms to be self-sufficient.

The Newlands Project shared the distinction of being among the first five Reclamation projects with the Milk River Project in Montana, the North Platte (Sweetwater) Project in Wyoming, the Uncompahgre (Gunnison) Project in Colorado, and the Salt River Project in Arizona. All were authorized on March 14, 1903. Beyond that, each project had its own unique attributes determined by local conditions such as topography, availability of materials, and soil types. Each of the projects also posed unique design challenges to the first generation of Reclamation engineers, and much was learned through trial and error.

Although not as extensive as other Reclamation undertakings, the Newlands Project was large for its day, and changed the economic and settlement patterns of the area it served, and altered the physical landscape with its miles of canals and laterals, and tracts of irrigated lands. Also similar to other early Reclamation projects, the successful completion of dams and canals did not insure success for its settlers. Other factors such as the high cost to develop lands for irrigation, poor understanding of soils and drainage, and inexperience with irrigation, created hardships that slowed development of project lands. As occurred elsewhere, Reclamation had to scale back its original estimates for potentially irrigable lands as it became apparent that the water was not available and the plans were overly ambitious. Finally, as with other irrigation systems, the Newlands Project has been dynamic and evolving to meet changing needs. Although various project components have been altered to ensure the safe and effective operation of the irrigation system, the major features still retain sufficient integrity to convey their significance, as does the system as a whole.

The Milk River Project is located in north central Montana and utilizes two river systems, the St. Mary and the Milk, to irrigate lands in the lower Milk River Valley. The project supplements the supply of water in the Milk River with water diverted from the St. Mary river system. Because both rivers cross into Canada, an international treaty governing the disposition of water was required before construction of major project features could proceed. It took eight years to negotiate the agreement. Due to the complexity of the project, an elaborate system of dams and canals was necessary to store and deliver water. In all, the St. Mary Diversion and Milk River Project involved the construction of seven major storage and diversion dams, and approximately 419 miles of canals and laterals, enabling the reclamation of approximately 125,000 acres of agricultural land.

The North Platte Project extends 111 miles along the North Platte River from near Guernsey, Wyoming to below Bridgeport, Nebraska. The project provides water for irrigation of approximately 390,000 acres, making it the most extensive of the original five. Supplemental water is supplied to an additional 109,000 acres. Main features of the project include Pathfinder Dam and its million-acre feet capacity reservoir southwest of Casper, Wyoming; Guernsey Dam and Reservoir; Whalen Diversion Dam; three regulating reservoirs; 1,602 miles of canals and laterals; and 352 miles of open drains. At the time of construction, the masonry arch Pathfinder Dam was one of the largest structures of its kind in the world. The engineering feat is listed in the National Register. For project irrigators in Wyoming and Nebraska, access to water ended the cattleman's monopoly of the land and raised agriculture to equal status in the region's economy. From the first deliveries of water in June 1909 to the early 1990s, project lands produced nearly $2 billion in crops. While conditions were at first difficult for builders and settlers, the North Platte Project continues to play a decisive role in the region it serves.

The Uncompaghre Project is located on the western slope of the Rocky Mountains in west-central Colorado. Project lands surround the town of Montrose and extend 34 miles along both sides of the Uncompahgre River to Delta, Colorado. Project features include Taylor Park Dam and Reservoir, Gunnison Tunnel, 7 diversion dams, 128 miles of main canals, 438 miles of laterals, and 216 miles of drains. The system uses water from both the Uncompahgre and Gunnison Rivers to serve over 76,000 acres of project land.

Prior to project construction, farmers in the Uncompahgre Valley struggled due to lack of sufficient water to irrigate. Through construction of the Gunnison Tunnel, water from the Gunnison River was transported to the Uncompahgre River for delivery to farm fields. The 6-mile-long tunnel was a major engineering feat. Construction difficulties encountered were enormous, and at the turn of the century a tunnel of that length was virtually unprecedented. In 1979, the Gunnison Tunnel was listed in the National Register. Upon completion of the tunnel in 1909, construction of other project works continued. In fact, it was not until 1923 that the diversion dam, the main canals, and all laterals were completed and in use. The project continues to provide an important agricultural base in western Colorado.

The Salt River Project, located near Phoenix, Arizona, includes an area of about 250,000 acres. Project water is furnished by the Salt and Verde Rivers. The rivers are controlled with six storage dams, two of which were constructed by Reclamation. A diversion dam constructed by Reclamation serves 1,259 miles of canal, laterals, and ditches. The power system includes five hydroelectric plants. The first dam completed on the project was the first major structure to be constructed by the Bureau of Reclamation. From the outset, Roosevelt Dam was intended to be a symbol of success and a showpiece for the newly created water development agency. Built between 1906 and 1911, the dam was an outstanding engineering achievement. The 280-foot-high structure holding back the Salt River was distinguished as the highest stone masonry dam in the world. The lake created behind the dam, known as Lake Roosevelt, contained more than a million acre-feet of water and was the world's largest artificial lake. The dam contributed more than any other dam in Arizona to the settlement of Central Arizona and to the development of large scale agriculture there. It also provided Central Arizona's first hydroelectric power source. Listed as a National Historic Landmark in 1963, Roosevelt Dam underwent major modifications in the 1990s that resulted in revocation of the designation in 1998. On March 16, 1998, the Theodore Roosevelt Dam National Register District, including the non-contributing Roosevelt Dam, was listed for statewide significance.

The Salt River Project's ultimate consequence was the growth of one of the most urbanized areas in the country. The water and power provided by the project propelled Phoenix's growth from a population of 5,000 in 1902 to 35,000 in 1922. By 1940, the census listed 65,414 people in the booming metropolis. Tourism and recreation activities also were a direct result of the project.

Project	**Acres Irrigated**	**# of Storage Dams**	**# of Diversion Dams**	**Miles of Canal/ Laterals**	**Initial Const. Period**	**First Water Delivery**
NEWLANDS	73,000	2	2	69 canal 312 lat.	1903-1906	Feb, 1906
NORTH PLATTE	390,000 & 108,000 supplemental irrig.	4	4	337 canal 1,261 lat.	1905-1915	
SALT RIVER	238,220 & 24,715 supplemental irrig.	6	1	131 canal 876 lat.	1903-11	1907
MILK RIVER	120,816	3	5	200 canal 219 lat.	1906-	1911
UNCOMPAHGRE	76,297	1	7	128 canal 438 lat	1904-1912	1908

PROJECT LOCATION

The Newlands Project is located on the Nevada-California border in the Reno-Fallon-Fernley area. Water for the project comes from Lake Tahoe; the Truckee River which flows from Lake Tahoe east for 105 miles to Pyramid Lake; and the Carson River, which flows east of the Carson Range of the Sierra Nevada Mountains and empties into the Carson Sink.

On the Truckee River, Lake Tahoe Dam impounds and regulates upstream water flow. Further downstream near Fernley, Nevada, Derby Dam diverts water from the Truckee River into the

Truckee Canal, which carries it 32 miles to Lahontan Reservoir on the Carson River and also irrigates farmland in the vicinity of Fernley. Lahontan Dam impounds direct flow of the Carson River as well as water diverted from the Truckee River. Releases from Lahontan Reservoir are diverted at the Carson River Diversion Dam into the south distributing "V" Line Canal and into the north distributing "T" Line Canal. Both canals transport water to the largest area of project lands in the Lahontan Valley around Fallon, Nevada. In addition to storage reservoirs, about 69 miles of main canals (Truckee, "V" Line and "T" Line), 312 miles of laterals, and a network of about 345 miles of drains, comprise the system of works (Water and Power Resources Service, Project Data, 1981, p. 687).

BACKGROUND[2]

The Newlands Project is indelibly associated with the expansion of the United States into the arid lands of the American West. Archaeological evidence indicates that Native Americans lived in the area of the Carson River and Truckee River drainages for at least 11,000 years (Elston, Handbook of North American Indians, Volume 11: Great Basin. 1986). Small bands of Northern Paiute Indians were the primary inhabitants of the area when Europeans first conducted forays there in the 1820s. Up until the late 1840's, the only non-Native Americans familiar with the Truckee and Carson River basins were a small number of explorers and furtrappers. In 1827, Jedediah Smith passed through the region some 75 miles south of Truckee Meadows while leading a party of trappers for the Rocky Mountain Fur Company. The following year, Peter Skene Ogden of the Hudson Bay Company, discovered the Humboldt River near Winnemucca. He returned the next spring and traced the river to its end in the Humboldt Sink. In 1841,the

[2] Portions of this multiple property documentation form are excerpted from two sources: Hardesty, Donald. "The Newlands Project, Nevada: Evaluating National Register Eligibility" July 2001, and Simonds, Joe. "The Newlands Project (Third Draft). 1996. Both documents were prepared for the Bureau of Reclamation.

Bidwell-Bartleson Party opened the California Trail through the region. Lieutenant John C. Fremont, leading a party for the U.S. Bureau of Topographical Engineers, became the first white man to view Pyramid Lake in 1844. Fremont named the body of water for a large rock formation on its eastern shore. He continued his explorations by following the Truckee River to where it turns west near present day Wadsworth. From there he headed south across the Carson River, then the Walker River, before heading up into the Sierra Nevada range.

In the spring of 1844, the Stevens-Murphy-Townsend emigrant party departed Council Bluffs, Iowa, headed for California. They would become the first party to use the direct route to California along the Humboldt and Truckee Rivers, and over Donner Pass. When the party reached the headwaters of the Humboldt River, they met an Indian guide named Truckee. He directed them west to the river which the party afterwards named Truckee in appreciation for his guide services. The group continued on to Donner Pass and into California.

The discovery of gold near Sacramento, California, in 1848 ignited a stampede of Euro-Americans into the region. Many who traveled to California in search of riches chose either the Truckee River/Donner Pass route or the more southerly route along the Carson River and through Sonora Pass. Although most fortune seekers perceived Nevada simply as a forbidding obstacle on their way West, some opted to stay in the Truckee-Carson Basin and try their hand at farming, ranching, trading, or prospecting. In 1852, the first permanent settlement along the Truckee River was established near the site of Reno.

In 1859, the discovery of the Comstock Lode changed Nevada history overnight. The news of precious ores incited a rapid influx of prospectors to the region and brought about Nevada's earliest urban settlement at Virginia City. Completion of the Central Pacific Railroad through the region in 1868 encouraged even more growth. The surging population soon placed heavy demands on the region's natural resources, including water and timber. Water to supply the increasing needs of the Comstock mines was diverted from the Truckee River and Lake Tahoe Basins, marking the beginning of interbasin water diversions. The demands for lumber to supply the mines and railroads led to the rapid growth of logging and milling operations throughout the Sierra Nevada. Before long, the rivers and streams in the area became clogged with sawdust and logging debris, preventing fish migration and seriously degrading the quality of the water in the Truckee River.

Precious metals mining dominated the booming economy of both the region and Nevada in the 1860s and 1870s. With continued growth came conflict and controversy. The 1860 Pyramid Lake Indian War resulted in the deaths of over 150 Indians and 75 whites. The City of San Francisco began to eye the waters of Lake Tahoe to supply the needs of the burgeoning city. Logging and mining continued to pollute the rivers and streams. In 1861, Congress granted Nevada territorial status. Among the first acts of the Territorial assembly was to pass a requirement that all dams constructed in Nevada allow for the natural transit of fish. Unfortunately, this mandate was frequently overlooked.

To support the ever-increasing number of settlers, ranching and agriculture both grew more prominent in the Truckee and Carson River basins. In 1851, a small contingent of Mormons from Salt Lake City planted crops in the Carson Valley to peddle to California-bound goldseekers (MacDonnell, <u>From Reclamation to Sustainability: Water, Agriculture, and the Environment in the American West.</u> 1999, p. 144) Farmers constructed small irrigation ditches in the early 1860s. The Pioneer and Cochran ditches diverted water from the Truckee River to irrigate lands in Truckee Meadows. Numerous dams were built on the Truckee River to divert water for irrigation or to power mills. In 1870, the California Legislature authorized the Donner Lumber and Boom Company to improve the channel of the Truckee River from the outlet of Lake Tahoe to the California/Nevada state line. The company constructed a rockfilled timber crib dam at the outlet of the lake, controlling the outflow of the lake for the first time. More dams were constructed along the Truckee River in the late 19th century, increasing diversions from the river and further limiting migration of fish.

Nevada's flourishing mining economy took a sharp downturn in the 1880s as a result of falling silver prices. Cattle ranching helped for a while, but unpredictable market prices, high railroad transportation costs, and several severe winters forced many ranchers into bankruptcy. In search of ways to alleviate Nevada's economic depression, William M. "Big Bill" Stewart and other Nevada politicians took up the causes of remonetization of silver and irrigation (Rowley, "Farewell to the Rotten Borough: Francis G. Newlands in Nevada." 1995, p. 113). Although Silver Party politics didn't go very far, the cause of irrigation as a way to enhance agricultural production in Nevada was vigorously pursued.

In 1889, the total area irrigated in Nevada was 224,403 acres. This closely paralleled the amount of irrigated lands in neighboring Idaho (218,249 acres) and Utah (263,473 acres). By the end of the century the number of irrigated acres in Nevada had climbed to 504,168. Most of these lands were meadows alongside the Humboldt River. During spring flooding, primitive irrigation systems directed the waters to cultivated fields. Lands along the Truckee and Carson Rivers were also subject to considerable cultivation and the summer flows of these rivers were largely utilized (Reclamation Service. First Annual Report of the Reclamation Service, 1903, p. 224.).

ORIGINS OF THE FEDERAL RECLAMATION PROGRAM

By the end of the 19th century it was apparent throughout the West that private irrigation interests simply lacked the financial resources and engineering capability to construct large-scale water storage and delivery systems. The limits of successful smaller cooperative efforts had been reached, and time and again, ill-financed grandiose projects boosted by speculators had ended in failure. All of the easily-irrigable lands had been developed and the vast arid expanse of remaining lands required complex and expensive irrigation systems. Even those who were opposed to government intervention were beginning to recognize that state or Federal support of irrigation was needed. Among those most actively involved in developing national reclamation policy were a number of Nevada politicians.

The first Federal law to address the unique water supply conditions in the arid West was the Act of July 26, 1866. Passed largely due to the efforts of Senator William Stewart of Nevada, the legislation was aimed primarily at the mining industry, where conflicts over water use in hydraulic mining operations had escalated. Under the law, which was written broad enough to include agriculture and other uses, local control over the use of water was acknowledged.

The 1873 Timber Culture Act required settlers to plant 40 out of 160 acres with trees, under the belief that trees encouraged rainfall. In 1877, the Desert Lands Act was passed which gave settlers 640 acres of arid land on the condition that proof of irrigation be demonstrated within three years. Neither of these Federal laws that relied on individual initiative were successful in establishing widespread irrigation.

At the forefront of a national irrigation movement was John Wesley Powell, noted explorer of the Colorado River. He passionately expounded that private enterprise lacked the financial resources or public interest to construct the reservoirs and delivery systems needed to expand irrigation in the West. Powell's advocacy for a greater Federal presence was highly disputed by those in favor of unchecked western expansion or states' rights.

In 1881, Powell became head of the United States Geological Survey (USGS) and, under his direction, the agency began its survey and mapping of the United States. Congress passed a joint resolution in March 1888 that not only authorized a survey of arid western lands, but also allowed for the withdrawal of all lands found irrigable. The resolution further provided that the lands could be reopened to settlement under the Homestead Act by proclamation of the President. In October 1888, at the onset of a drought in the West, Powell secured an initial modest amount of $100,000 from Congress to begin the irrigation survey of arid western lands. In March 1889, an additional $250,000 was appropriated to continue the work. Surveys were conducted of canal routes and reservoir sites in seven western states including Nevada. A total of 150 canal routes were identified and 30 million arid acres were deemed irrigable (Robinson, Water for the West: The Bureau of Reclamation, 1902-77. 1979, p. 12). In the summer of 1889, Powell was invited to accompany the United States Senate Committee on the Irrigation and Reclamation of Arid Lands, headed by Senator William Stewart, on a tour to view first hand the irrigation needs of the West. Among the numerous stops made to conduct public hearings was Carson City, Nevada.

Much criticism was directed at Powell, including from most members of the Arid Lands Committee, for his policy of withdrawing from settlement all lands susceptible to irrigation until further directed by Congress. Fierce negative reaction engendered largely by speculative and grazing interests resulted in the repeal in 1890 of the portion of the 1888 Joint Resolution allowing for the land withdrawals, except for the reservoir sites themselves. Funding for the surveys was also cut which precluded the completion of work in Nevada. Despite the setbacks, the Geological Survey continued to study water resources in the arid West in the 1890's.

Up until 1890, broad public support for an organized irrigation movement did not exist. As William Smythe, one of the West's strongest reclamation advocates, wrote, "Irrigation was an unpleasant word, repellent and depressing. The word "arid" was synonymous with worthlessness." Attitudes towards irrigation were changing however. The worsening drought plaguing the West and devastating farmers was the catalyst for a series of National Irrigation Congresses, the first of which was held in Salt Lake City in 1891. The congresses did much to draw attention to the need for a greater government role in the reclamation of arid lands in the

United States.

In 1894, the U.S. Congress passed the last major irrigation legislation prior to the Reclamation Act of 1902. The Carey Act asserted responsibility of the States rather than the National Government to oversee irrigation development. The law granted each Western State up to one million acres of public domain on condition that the lands be irrigated and occupied. Following approval by the Secretary of the Interior of a State's request for participation, settlers on the segregated arid lands were given 10 years to cultivate at least 20 out of each 160-acre tract. Once proof of irrigation and settlement was submitted to the Secretary of the Interior, the lands would be turned over to the States, and in turn, patented to the settlers.

In Nevada, as in most other Western States, the Carey Act was largely unsuccessful. Although Nevada applied for 185,445 acres under the legislation, only about 1,500 acres were eventually patented to settlers (Golze, Reclamation in the United States. 1952, p.19). The States simply did not have the financial resources or technical expertise to implement large-scale irrigation projects.

FRANCIS G. NEWLANDS AND PASSAGE OF THE RECLAMATION ACT OF 1902

By 1900, it had become evident that the array of incentives for local and State development of large-scale irrigation works had been unsuccessful in yielding significant results. Support for a greater Federal role was growing among western congressman, and among those at the forefront was Nevada Representative Francis G. Newlands.

Newlands, a wealthy Californian, moved to Carson City, Nevada, in 1888 and a year later to Reno. He became actively involved in the State's economic and political affairs, and in 1892 was elected to the U.S. Congress. He served as a representative until 1903 when he was elected to the U.S. Senate. From the outset of his political career, Newlands became an advocate and spokesperson for the reclamation of arid lands. He was also the owner and developer of lands in western Nevada and eastern California. Among the properties he purchased were strategic sites for water storage and irrigation along the Truckee and Carson rivers; he offered these to the state of Nevada in 1890 but no action was taken by the legislature. A number of years later, Newlands bought Donner Lake in California and offered to sell it on generous terms to any irrigation district that might be formed in the area (Glass, Water for Nevada, the Reclamation Controversy. 1964, p. 40). Included in the large acreage that Newlands eventually amassed was the site of what would later become Lahontan Reservoir.

Unlike most western promoters, Newlands advocated rational planning and orderly economic development as vital to successful irrigation. He applied these principles to his own projects by hiring engineers and geologists to conduct studies and develop plans. A leading proponent for reclamation in the 1890s, Newlands initially fought for State sponsorship of irrigation projects. Over the course of the decade, he became convinced that State governments as well as private enterprise were not capable of successfully accomplishing large-scale irrigation projects and called for a greater Federal role (Robinson, p. 15).

At the annual meeting of the National Irrigation Association held in Chicago in November, 1900, Newlands and two other leaders in the Reclamation movement, George W. Maxwell and Francis H. Newell, spoke in strong support of proposals under consideration for the Federal construction of irrigation works. The team of three, consisting of a politician, a publicist, and an engineer, worked separately and together throughout 1900 and 1901 to garner congressional and public endorsement for Federal reclamation (Robinson, p. 15).

On January 26, 1901, Newlands introduced legislation in Congress for a national reclamation program. The bill, drafted with the assistance of Maxwell and Newell, failed to pass. The momentum and support for Federal sponsorship of irrigation had grown, however, and the movement received a tremendous boost when Theodore Roosevelt became President in September 1901. Having lived in the West, he had firsthand knowledge of its arid condition and acted quickly to establish a Federal reclamation program. In his message to Congress at the opening session in December 1901, he became the first President to recommend Federal legislation for the reclamation of arid lands in the West.

With the strong support of the President behind them, a committee of seventeen congressmen, one from each western state, met under the chairmanship of Nevada Representative Francis G. Newlands and drafted an irrigation bill. Introduced into Congress by Newlands, the bill quickly passed through both houses and was signed into law by President Roosevelt on June 17, 1902.

Under the terms of the Newlands Act, commonly referred to as the Reclamation Act, the Secretary of the Interior was authorized to locate and construct irrigation works in the arid Western States and territories. Funding for construction of these projects was to come from the sale of public lands within the benefitting states and territories. Following completion of project facilities, project lands would be opened for settlement under provisions of various homestead laws and in tracts no larger than 160 acres. The 160 acre limitation was designed to prevent land speculation and to encourage homesteading by individuals and families, a major focus of western irrigation supporters. Newlands had been adamant in his belief that families, not corporations, should be the beneficiaries of Federal reclamation works. Settlers were required to reclaim at least one-half of their land for agriculture. Project construction costs were to be repaid over a period of time by the project settlers. The agency established to administer the provisions of the Act was initially called the United States Reclamation Service (Reclamation Service). F.H. Newell, an irrigation engineering authority previously with the Geological Survey, was named

Chief Engineer of the new bureau.[3]

BEGINNINGS OF THE NEWLANDS PROJECT

Eleven days after passage of the Reclamation Act, Newell privately submitted six possible projects to the Secretary of the Interior. Among them was the Truckee-Carson Project which proposed to furnish water to around 400,000 acres in Western Nevada (MacDonnell, p. 144-45). In July, the Secretary withdrew 2.6 million acres of Federal public lands in the Truckee and Carson basins from entry under the Homestead Acts. In February 1903, the Nevada legislature, responding to influence exerted by Newlands, passed the Irrigation Law of 1903. It established the Office of State Engineer responsible for solving water problems and administering water rights. The act also provided for cooperation between the State of Nevada and Secretary of Interior in developing Federal reclamation projects.

On March 7, 1903, Charles D. Walcott, Director of the USGS, wrote to Secretary of the Interior E.S. Hitchcock requesting approval to undertake the first five Reclamation projects. Among them was the "Truckee Project" in Nevada. Just a week later, on March 14, the Secretary of the Interior authorized proceeding with all five projects. Three million dollars were initially allotted for the Truckee Project. The official name change from Truckee or Truckee-Carson Project to Newlands Project took place in March 1919, in honor of Francis Newlands, who died in December 1917.

The Truckee River Basin had been recognized early on for the irrigation possibilities that existed

[3] In 1923, the official name was changed to the Bureau of Reclamation. The Reclamation Service was originally placed within the U.S. Geological Survey. In 1907, it was established as a separate bureau within the Department of the Interior. Newell's title changed from Chief Engineer to Director. He remained in that position until December 1914.

there. It was one of the areas investigated by Powell's Irrigation Survey in 1889-90. Further surveys of reservoir sites and measurements of river flows along the Truckee and Carson Rivers, among others in Nevada, were conducted at the turn of the century by Leon H. Taylor, a USGS hydrographer. His work was instrumental in the selection of the site of the Truckee-Carson Project. Compared to other locations, it had two key ingredients in its favor. The first was the availability of large areas of unclaimed public lands suitable for irrigation downstream on the Carson River and, to a lesser extent, on the Truckee River. Elsewhere in Nevada, most of the lands that controlled the use of water had fallen into private hands thereby precluding settlement opportunities (USRS First Annual Report, p. 224). The second factor in favor of the Truckee-Carson Project was Lake Tahoe. Its enormous water supply could be managed easily for irrigation releases by constructing a relatively small dam at the outlet of the lake.

Early studies for the project called for a system of waterworks extending from Lake Tahoe into the Truckee and Carson River basins and beyond to Lovelock and the Humboldt Sink (Townley, Turn This Water Into Gold, The Story of the Newlands Project, Second Edition,1998, pp. 22, 36). Several reservoirs, diversion dams, and canals formed the core of the undertaking. Water would be diverted from the Truckee River to the Carson River where it could be used to irrigate lands in the Carson River Basin. To accomplish this, a diversion dam constructed on the Truckee River would divert water into a 31-mile-long main canal that would convey it to the Carson River. A second dam constructed on the Carson River would divert water into project canals for delivery to project lands. Key to the project would be a storage dam at Lake Tahoe, a beautiful natural lake straddling the California and Nevada state lines. Enlarging Lake Tahoe would ensure an adequate supply of water during the late irrigation season when the flows of the rivers were at their lowest. Several other storage reservoirs on the Truckee and Carson Rivers were also considered (Simonds, 1996, p. 4). Reclamation initially estimated that the project could irrigate about 400,000 acres. As planning and construction proceeded, this grand scheme was gradually scaled back to a project serving about 200,000 acres (1912) and eventually, in

1926, to an irrigable area of about 73,000 acres. This reduction in size reflected the realization that the water supply was simply not available to irrigate the vast acreage originally intended.

PLANNING AND CONSTRUCTION OF MAJOR PROJECT FEATURES: 1902-1915

Almost immediately following selection of the Truckee-Carson Project, the newly-created Reclamation Service opened an office in Reno and placed Leon H. Taylor in charge as supervising engineer.(Simonds, p. 8). A phased construction plan was developed with the diversion dams and canals to be built first followed by the storage facilities. Work started with construction of Derby Diversion Dam (originally called the Main Lower Truckee Diversion Dam) on the Truckee River about 20 miles below Reno, and the 31-mile long Truckee Canal (originally called the Main Lower Truckee Canal) originating at Derby Dam (USRS Second Annual Report, 1904, p. 365). This initial component was broken down into three divisions and separate bids were solicited for the construction of each division. Division 1 included Derby Dam, the headworks of the Truckee Canal, and the first six miles of the canal. Divisions 2 and 3 covered the remainder of the canal (Simonds, p. 8).

Bids for construction of the dam and canal were opened in Washington D.C. by the Secretary of the Interior on July 15, 1903. The contract for Divisions 1 and 2 was awarded to C.A. Warren & Company with bids of $324,967 for Division 1 and $415,020 for Division 2. The contract for construction of Division 3 was awarded to the E.B. & A.L. Stone Company who submitted a low bid of $250,700. The contracts for the diversion dam and canal were among the first awarded by the infant Reclamation Service. The specifications for Derby Dam bear the distinction of being the first issued by the agency.

Construction of the project began soon afterwards. The contractors, advertising widely in cities throughout the American West, hired more than 500 men to work on the dam and over 1,000 workers to dig the Truckee Canal. Because of the remoteness of the project location, laborers had to live in temporary camps set up near construction activities. The camp at the Derby Dam site soon acquired a reputation as a "hell hole" of violence, crime, gambling, and prostitution. Other construction camps were established along the route of the Truckee Canal. In 1904, the Reclamation Service moved its Reno office to the small town of Hazen located on the Southern Pacific Railroad route (Townley, p. 26). Growing rapidly, Hazen soon earned the same reputation as Derby camp. Completion of Derby Dam and the Truckee Canal brought about the abandonment of the work camps and, in December 1906, the Reclamation Service relocated its Hazen office to the growing town of Fallon.

The first work at Derby Dam consisted of the construction of a temporary dam on the Truckee River upstream of the permanent dam site. A temporary flume and ditch diverted the Truckee River around the location of the future dam. Once the site was free of water, the foundation area was cleared, providing a solid base for the dam. A cutoff wall consisting of parallel and interlocking steel sheet pilings, and designed to prevent seepage under the dam, was the first feature of the dam itself to be constructed. Then the contractor began the placement of concrete over the foundation area. The dam, completed in 1905, consists of a gated concrete structure spanning the Truckee River and an earthen embankment extending from the north abutment in a northwesterly direction for nearly 1,200 feet. The concrete structure originally consisted of 16 bays, each one containing a lower and upper slide gate. A series of regularly-spaced concrete piers formed the bays and accommodated the metal gate guides. Three of the original center gates were removed in 1929 and replaced with one large 10- by 25-foot flood gate. Another alteration occurred in 1908 when a wooden fish ladder was installed. This feature was repaired, altered and practically reconstructed in 1912. The resulting fish ladder was a wood flume containing flashboards. The dam has a diversion capacity of 1,500 cubic feet per second (cfs).[4]

The Truckee Canal was constructed at the same time as Derby Dam. Located at the south end of Derby Dam, the canal headworks consist of nine 5-foot by 10-foot slide gates separated by concrete piers. The canal follows the broad Truckee River Canyon before turning southward to terminate at Lahontan Reservoir. Started in September 1903, excavations were carried out using steam shovels and horse-drawn fresno scrapers. The most difficult aspect of the construction was the approximately 10-mile stretch through the steep canyon. Four tunnels, all reinforced with concrete, were built along the canal route to reduce its overall length and minimize excavation costs. The tunnels range in length from 213 feet to 1,515 feet and cover a combined distance of nearly 3,000 feet. At a number of points along its route, the canal incorporates control gates to release water for irrigation of adjacent lands. At its terminus, the canal originally discharged into the Carson River through a temporary timber chute, the last feature to be finished. With the anticipated construction of Lahontan Dam, the terminus was changed in 1910 so that the canal now empties via a concrete chute into Lahontan Reservoir. The change in terminus apparently extended the canal by about a mile to its present length of 32 miles. With a capacity of 1,500 c.f.s., a bottom width of approximately 20 feet, and a maximum water depth of 13 feet, the canal was completed in May 1905. Amid great excitement, a congressional delegation led by Senator Newlands dedicated Derby Diversion Dam and opened the headgates of the Truckee Canal on June 17, 1905, exactly three years after passage of the Reclamation Act. It was the first time that water flowed from a Federal Reclamation project to "make the desert bloom".

On September 9, 1904, the Reclamation Service awarded the first of four contracts covering

[4] Derby Dam was subsequently modified in 1999 when the downstream apron was completely replaced.

various construction aspects of the Carson River Diversion Dam and the conveyance structures that would carry water to farmers' ditches in the area around Fallon (Simonds, p. 5). The Carson River Diversion Dam, located about five miles downstream from where the Truckee Canal empties into the Carson River, was completed by September 1905. The concrete dam is 23 feet high with a crest length of 241 feet; it has a diversion capacity of 1,950 c.f.s. The outlet works consist of a spillway with 21 5- by 10-foot double leaf slide gates and one 15-by 10-foot hinged gate.

Also finished by September 1905 were the two main canals built to carry water from the Carson River Diversion Dam to farms in the vicinity of Fallon. The nine-mile-long northside canal ("T" Line Canal) begins at a headgate at the north end of the dam and traverses a particularly sandy region on the north side of the river. The canal is 10 feet wide at the bottom, six feet deep, and has a typical maximum water flow of 450 cubic feet per second. The southside canal ("V" Line) extends from a headgate at the Carson River Diversion Dam for 27 miles long along the south side of the river. The canal has a bottom width of 22 feet, a depth of 12 feet and a typical maximum water flow of 1,500 cubic feet per second.[5] Lands served by the "V" Line Canal are of more varied soil types than those under the "T" Line Canal.

Construction of the canal network proceeded at a fast pace. The distribution system was divided into districts, numbered one through seven, with district one located just south of Fallon and district two to the north. By the end of 1906, both districts were reported near completion. Work in all the other districts had started and, in some cases, was well underway. Among the features finished was the principal branch of the "V" Line Canal, known as the "S" Line. It

[5] At 5.8 miles below the headgate, a powerhouse was built by TCID in 1955 to take advantage of a 26-foot drop. The V Canal Powerplant included two generators each capable of generating 400 kw.

extends the "V" Line Canal by 5.28 miles. Another major canal, the "A" Line, had also been started. It takes off from the "V" Line Canal eight miles below its headworks and is about 13.4 miles long. The "A" Line Canal's base width varies from 4 feet to 13 feet and its depth ranges from 3 to 6 feet. In April 1906, excavation started on the "D" Line Canal located in district 4 to the northeast of Fallon. In conjunction with the canals, a complex web of laterals was constructed that covered many miles. Much of the distribution system was built by government forces, sometimes with the assistance of cooperating entities such as water users groups. "One hundred head of stock" also contributed to the work force in districts 5 and 7. By the end of 1914, Reclamation reported that 696 miles of canals had been completed.[6]

The next phase of the Truckee-Carson Project consisted of developing storage facilities. Constructing a new dam at the outlet of Lake Tahoe to replace a smaller existing one owned by the Donner Boom and Logging Company was an integral component of Reclamation's plans. Agency engineers had estimated that waters released annually from Lake Tahoe alone could irrigate 100,000 acres. Unknown to the government, downriver power companies were also negotiating with the Donner Company, and in September 1902, the Truckee River General Electric Company purchased the dam for $40,000. Following the transfer, the government began negotiating with the power company and in April 1903, agreed to purchase the dam for $100,000 and a guarantee of sufficient water flows to generate electricity. Government officials in Washington believed the price to be too high and opted to condemn the dam instead and take control through the Federal courts. In July 1904, Reclamation gained control of 63 acres just below the existing dam and began plans to construct a new dam to control flows from Lake Tahoe (Simonds, pp 5-6).

[6] This figure must include laterals as they are not broken out separately. U.S. Department of the Interior. United States Reclamation Service. Truckee Carson Project, Nevada. Outline History 1906-1912. April 1914. No page number.

The following July, the Reclamation Service contracted for the construction of a new dam at Lake Tahoe; however, the work came to an immediate halt because of an injunction filed by power companies with existing water claims. The power companies were not the only ones opposed to Reclamation's plans for the lake. Fears ran high among owners of shoreline property that the new dam would allow the lake to be drained to a level five feet lower than the existing minimum level, while the storage level would raise the lake ten feet above the existing maximum height (Townley, p. 37).

While the Reclamation Service studied alternative approaches to gain control of Lake Tahoe with little success, water use on project lands increased. In the summer of 1908, farmers faced a crisis when the project experienced its first serious water shortage. The combined flows of the Truckee and Carson Rivers could not meet the late summer irrigation demands. To provide a more secure water supply, Reclamation planners investigated several sites on the Carson River for construction of a dam and reservoir. One location, known as the Lower Carson Reservoir Site, was near the point where the Truckee Canal emptied into the Carson River. Reclamation had purchased the lands at the potential reservoir site from Newlands in 1904. In December 1910, after several years of water shortages and unsuccessful efforts to build a dam at Lake Tahoe, the Secretary of the Interior authorized construction of Lahontan Dam by government forces at the Lower Carson Site. This dam would be capable of holding back the entire flow of the Carson River as well as water diverted from the Truckee River via the Truckee Canal.

Reclamation completed designs for Lahontan Dam in 1910 and construction by government forces was approved by the Secretary of the Interior on the last day of that year (USRS 10th Annual Report, p. 166). In February 1911, work started on the residential construction camp. The labor force at that time comprised fifty men but by the end of the year had reached 200. Housing for the workers was segregated in two separate areas. Lahontan City, located on high ground north of the dam site, accommodated English-speaking laborers, supervisors, and a number of families. The settlement had a cookhouse, bakery, billiard hall, school, store, barber shop, hospital, library, and its own marching band. A water and sewer system was also provided. At the height of construction, when 220 men were engaged on the project, the camp employed nine Japanese cooks and waiters. About fifty Bulgarian and Armenian workers resided at Bohunkville next to the dam site along the Carson River. They lived in tents with floors and built-in bunks. The camp also included a few Italians who lived in their own houses (Reclamation Service, Outline History 1906-1912, p. 161). After the completion of Lahontan Dam in 1915, both Lahontan City and Bohunkville were abandoned.

The remote location of the dam site prompted Reclamation to construct a hydroelectric powerplant to provide power for construction activities. Upon completion in early November of 1911, the stone and concrete powerplant generated 1,000 kilowatts of power by diverting water near the end of the Truckee Canal into a 500-foot-long steel penstock to drive two General Electric 500 kilowatt generators. The powerplant supplied electricity to run much of the construction machinery used on the project. D.W. Cole, the project manager, stated that

> Probably the first electric shovel was employed on this work and handled the 500,000 cubic yards of gravel at a cost very much below what a steam shovel would have shown at the local prices for coal (Engineering News, volume 73, April 22, 1915, page 760).

In addition, the powerplant ran electric motors on a dragline excavator, a 925-foot-long belt conveyor to transport gravel and soil to the main embankment, the sand-cement batching plant, a 1,600-foot-long cableway for transporting concrete, and numerous pumps, blowers, drills, and conveyors (Hardesty, Donald. p. 8).

Work on the dam itself proceeded along with the powerplant. Blasting of the trench for the cut-off wall near the upstream toe of the dam began in late March 1911. Designed to prevent seepage of water under the dam embankment, the wall reaches a depth of between 30 and 60 feet below the original ground surface with the top of the wall extending 6 to 8 feet above the surface and into the dam embankment. Additional protection was provided by pressure-grouting the areas surrounding the cut-off wall.

Control of the Carson River during construction was achieved by first constructing the outlet works and then diverting the river through them. Two reinforced concrete conduits, each nine feet in diameter, originally comprised the outlet works and discharged water into the spillway pool. The first diversions were made through the left conduit in November 1912. A month later the right conduit was completed. A six-foot six-inch diameter steel penstock, controlled by a cylindrical valve, was constructed to carry water to the Lahontan powerplant located downstream from the dam.

A unique feature of Lahontan Dam is the curved pair of concrete spillways, one at each end of the main dam, that discharge into a common circular stilling pool. The layout was designed so that the energy of the spillway flows would cancel each other out when they converged in the nearly one-acre pool. Each spillway has an uncontrolled concrete crest approximately 250 feet long and their combined design capacity is 30,000 c.f.s. Starting with excavation of the left spillway in June 1911, construction of both spillways and the stilling pool was completed by the beginning of 1915.

While work on the spillways proceeded, the earthen embankment took form. It is composed of two zones of compacted fill material. The downstream zone consists of gravel fill, while the upstream zone is made up of a mixture of earth and gravel placed in layers, wetted, and rolled by 10-ton, steam-powered traction engines. The materials were transported from storage bins to the center of the embankment by a 925-foot long conveyor belt. The materials were then spread out using horse drawn dump wagons before being moistened and compacted. The entire embankment is protected by a 12-inch layer of gravel. In addition, the upstream slope is covered by a 2-foot layer of riprap. A 12-foot wide roadway crosses the top of the dam. On each of the concrete spillways, the road is carried by five-span continuous reinforced concrete arches with 50-foot spans and five foot rises. An earthen wing dam or dike about 4 feet high, level with the top of the principal dam, extends southward for three-quarters of a mile. When completed in 1915, Lahontan Dam stood 124 feet above the stream bed and 1,300 feet long. The reservoir created behind it has a maximum capacity of about 317,000 acre-feet, with flashboards installed, and has a shoreline of almost 70 miles (Simonds, p. 7).

When the dam was nearing completion, the government advertised the leasing of the powerplant to the private sector. On December 14, 1914, the Canyon Power Company of Oakland, California took possession of the plant and shortly afterwards began construction of a 90-mile-long transmission line to the City of Lovelock and the mining camps centered around Rochester, Nevada. The company also took over a line constructed by the government that provided electricity to Fallon. A month after the dam's completion, the Canyon Power Company began installation of a third, 500 kw generating unit. The installation was completed in June 1915, bringing the capacity of the plant up to 1,500 kw. A secondary concrete penstock was added that fed water from the reservoir to the primary steel penstock.

While the Reclamation Service progressed with work on Lahontan Dam, efforts to gain control of Lake Tahoe continued. Because of severe drought conditions in 1912, the Reclamation Service was forced to close the downstream gates of the Derby Diversion Dam, diverting the entire flow of the Truckee River into the Truckee Canal. As a result of this action, dead and dying trout could be found in the stream bed for several miles below the dam. In September 1912, the Reclamation Service and the Truckee River General Electric Company, whom many believed were intentionally withholding water from the farmers, sent a work crew to Lake Tahoe to dredge the channel and cut down the rim to release more water. Although the action was blocked by a court injunction, the incident was typical of the kinds of activities that sparked controversy over the use of Lake Tahoe's coveted waters (Simonds, p. 7).

In 1913, the controversy surrounding construction of the Lake Tahoe Dam was finally resolved when the Reclamation Service and the power company agreed to complete construction of the dam which had been started in 1905, but delayed by the protracted legal battles. The dam, completed in 1913, is a concrete slab and buttress structure, 109 feet long and 18 feet high. Releases into the Truckee River are controlled by seventeen 5-foot by 4-foot vertical sluice gates. A wooden structure over the gates protects the hoist mechanisms. Earthen embankments abut the concrete structure at both ends. There is no spillway. The dam controls the top six feet of the lake to provide about 732,000 acre-feet of active conservation for irrigation purposes (Simonds, p. 7).[7]

On June 28, 1915, based on a June 4, 1915, consent decree issued in Federal Court (*United States v. Truckee River General Electric Company)*, the United States assumed control of the dam at Lake Tahoe. The decree, known as the Truckee River General Electric Decree, essentially gave the Reclamation Service an easement to operate the dam and use the surrounding property, subject to certain restrictions. Under the agreement, the Reclamation Service was to guarantee certain year-round flow rates to support hydropower operations

[7] Safety inspections of Lake Tahoe Dam in 1978 and 1980 found damage in the concrete apron downstream from the dam and structural problems with the dam's ability to withstand an earthquake. The inspections led to repair work and structural changes in the dam in 1987 and 1988. Alterations included the construction of a new sheet pile wall downstream from the dam, the replacement of the damaged apron with new reinforced concrete, the construction of reinforced concrete stabilizing walls in the existing embankments, the installation of concrete embankment caps over both embankments, and reinforced embankment and slope protection (Simonds,1996, pp. 30-31)

downstream. These flow rates, known as "Floristan Rates", would be used as the basis for future Truckee River water use agreements. After more than a decade of controversy and conflict, the Reclamation Service had finally gained limited control of the waters of Lake Tahoe.

The fruition of Lake Tahoe and Lahontan dams brought to a close the construction of the major features of the Truckee-Carson Project. By June 1915, the distribution system in operation was also considerable. Three hundred miles of canal and laterals had been completed including all of the laterals taking out of the Truckee Canal in the vicinity of Fernley and Hazen (Reclamation, 14th Annual Report, p. 187, 184). Even so, in June 1915, the project was considered only 62 percent complete. Still contemplated for future construction were additional storage reservoirs in the upper Carson Valley and upper Truckee basin, extensions of the irrigation system to increase the amount of irrigated lands; and extensions to the drainage system (Reclamation, 14th Annual Report, p. 184).

CONTINUED CONSTRUCTION: DRAINAGE FACILITIES & PROJECT REPAIRS, 1916-1928

The construction of storage and diversion dams, canals, and laterals, did not guarantee success for the early project settlers. It soon became apparent that adequate drainage facilities were lacking as thousands of acres became waterlogged and unusable. The original engineering reports called for deep, open drains spaced a maximum half-mile apart, but cost-cutting decisions greatly reduced the depth and number of drains (Townley, pp. 43-44). As early as 1909, saturated soils and salinization in newly irrigated agricultural fields threatened the project. The Reclamation Service responded by authorizing numerous studies of the problem between 1910-1912 and making some experimental repairs thereafter. The agency installed about five miles of closed tile and surface drains, and deepened about seven miles of existing surface drains south and east of Fallon (Reclamation, 14th Annual Report, p. 186).

Problems persisted and increasingly dissatisfied settlers formed an informal organization to demand action. The water users claimed that the Reclamation Service had promised adequate drainage, while the Reclamation Service contended that the problem was due to over-irrigation and that the farmers should assume the cost of constructing the drainage system. Offers by the Reclamation Service to correct the drainage problems with the costs paid by the water users were overwhelmingly rejected. Anger among irrigators continued to mount and, finally in 1916, Reclamation agreed to fund a better drainage system pending the formation of a water users association that could contract for the excavation of new drains. The State of Nevada legislature authorized creation of a new irrigation district in March 1917, but dissent among a faction of large property owners on the project delayed approval by a majority of water users for more than a year. Finally on November 16, 1918, the Truckee-Carson Irrigation District (TCID) was formally established (Townley, pp. 46-47).[8]

It took another several years before TCID and Reclamation finally entered into an agreement on the construction of drains. This occurred on January 22, 1921, and shortly thereafter work began on the first phase of the drainage project. It took nearly two and a half years to complete and cost $700,000. Construction crews excavated over 150 miles of drains that were 10 feet deep and 9 feet wide at the bottom. The need for a second phase became apparent before the first one was even completed, and following approval by the Secretary of the Interior, Congress, and TCID, a sum of $245,000 was expended on an additional 81 miles of drains. This work was finished by June 1928 and with an adequate system in place, the drainage problems plaguing the project were largely resolved.

By 1923, after nearly twenty years of operation, various elements of the project had deteriorated and were in need of repair. At Lahontan Dam, alterations began as early as 1918, when a gunite

[8] On April 14, 1935, TCID assumed operation of the powerhouse at Lahontan Dam.

coating was used to repair deteriorating concrete in the dam spillways.[9] Changes were also required to improve the power operations at the dam. Power outages sometimes occurred in late summer when the flow from both the canal and the reservoir level dropped too low to use either the steel or concrete penstock. To correct the problem, the concrete penstock was replaced with another steel penstock running through the left outlet conduit from the base of the outlet tower into the power house. This work was completed in June 1925 and ensured a more reliable water delivery system to the powerplant when water levels in the lake were low.[10] Part of the left spillway and about one-half of the spillway pool wall were also reconstructed.

In a report dated October 23, 1926, Reclamation engineer A. W. Walker described a number of deficiencies on the Truckee Canal including cracking of several hundred feet of concrete lining in Tunnels No. 1 and 3, accumulation of almost 160,000 cubic yards of material in the same canal, and significant deterioration of the concrete apron downstream from Derby Diversion Dam. In addition, numerous other minor problems were identified. Work to correct the problems began in October 1927 and was carried out by government forces. Tunnel repairs consisted of placement of railroad rails as supports for the roof of the tunnels. The rails were bent into shape and the ends embedded in the existing lining of the tunnel. During this time period, the previously described changes to the gate structure at Derby Dam were also made.

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[9] The coating did not perform well and was removed in 1935.

[10] More modifications to the powerplant between 1947 and 1954 upgraded the output of each of the three generators to 640 kilowatts. TCID installed two 1,000 kw diesel-powered generators next to the Lahontan plant in 1949. Both of these generators have since been removed. Additional repair work at Lahontan Dam occurred in 1985 when both spillways and the walls and the floors of the stilling basin were covered with six-inch thick concrete overlays (Simonds, p. 29).

PROJECT SETTLEMENT AND ECONOMIC DEVELOPMENT: 1904-1929

From the outset of the project, Reclamation promoted it with great optimism, extolling the choice farmlands and abundant irrigation water that would be available. Eager to attract settlers, the newly created agency was anxious to establish a successful reputation and also wanted to insure repayment of construction costs through the sale of public lands. Beginning in 1904, Reclamation offered its first land parcels in tracts ranging from 80 to 160 acres. These were located mainly around Fallon although some were available in the vicinity of Fernley. The advertising campaign was successful and expectant homesteaders moved into the area, in anticipation of becoming prosperous farmers. Despite promises of delivering water in 1905, Reclamation was unable to do so, and those settlers who had eagerly prepared their lands for irrigation faced their first disappointments.

Water was first supplied to homesteaders on February 5, 1906. By that season, 674 men, women, and children, had moved onto project lands. Despite the fact that a profitable market existed for produce, especially hay, in the new mining camps of Tonopah and Goldfield, the project got off to a shaky start. Many settlers were not familiar with irrigated farming, especially in desert conditions, and they stripped the sandy fields bare of all vegetation. Windy conditions blew away soils and filled in ditches with sand. The ample water supply promised by Reclamation was not forthcoming (Townley, p. 27).

Already by 1907, the project had fallen on hard times. Although 850 farm units were available to settlers at $22 per acre, only 300 farms were occupied and many of these were in bad straits. The costs to develop lands for irrigation proved higher than Reclamation had estimated, and many settlers were not able to afford the expensive improvements. In some cases, homesteaders delayed development of their farms, in other instances, they simply gave up (Reclamation, 24th Annual Report, p. 24). To make matters worse, in 1907 the Lahontan Valley suffered one of its worst floods on record and then experienced a drought resulting in water shortages. Further aggravating the situation was the institution of operation and maintenance charges that year.

Reclamation could not deliver on its promises, partly because they had been exaggerated from the outset and also because of lack of scientific understanding. Soil science and land classification were still in their infancy and not well understood. The inadequate drainage system resulted in fields being drowned in water, killing plants. Many farms were abandoned due to alkali soils that were not productive. The adverse conditions prompted the Secretary of the Interior to issue an order on July 26, 1907, stating that no new work on canals and laterals could be performed until the available irrigable lands were settled (Reclamation, Outline History 1906-1912, 1914. P. 67).

By 1908, it was obvious that 40 acre farms on desert lands were not large enough to sustain a family. The first project crop report, produced in 1909, placed the total crop value that year at $335,000 (Reclamation Era, June 1952, p. 130). By 1912, the project was being dismissed by some as a failure and a loss to the government of millions of dollars. The continued wrangling by Reclamation to build a dam at Lake Tahoe meant that the amount of water initially anticipated could not be delivered. Land entries on the project had been closed in 1910 pending the completion of storage reservoirs on either the Carson or Truckee Rivers. Crop yields suffered due to the severe water shortages late in the summer. Irrigated acreage in 1912 was only 36,620 acres (Reclamation, 14th Annual Report, p.187), and the number of farms irrigated by project water was 497. A comprehensive study of the water supply completed in January 1912 by Supervising Engineer Hopson concluded that even with Lahontan Reservoir developed to a capacity of 290,000 acre feet and Lake Tahoe developed to a capacity of 720,000 acre feet, the available water supply would be sufficient to irrigate 206,000 acres, falling far behind the 400,000 acres that Reclamation originally projected (Reclamation, Outline History, P. 69).

With the completion of Lake Tahoe Dam and Lahontan Dam, conditions on the Newlands project improved and the future appeared brighter. With the availability of sufficient irrigation water supplies, Reclamation made plans to open some 12,000 acres for homestead entry and water right applications in the summer of 1914. Prior to doing so, however, Reclamation sent out an appeal to all existing project water users asking their advice on what a new settler would require in terms of capital and equipment to successfully develop a 40-acre farm. In an apologetic tone, the letter solicited information to include in a new project prospectus, ". . .since previous project pamphlets have been more or less criticized for giving too hopeful a view of our prospects we would like to have a consensus of your views for incorporating in this pamphlet... All of us want to develop the project in the best possible way and perhaps you can help to hold out such hopes and fair prospects, . ."(Reclamation, Outline History, p.198). On August 19, 1914, a public notice for the opening of the Second Unit of the Truckee-Carson Project was issued by Secretary of the Interior Franklin Lane.

Further boosting the more favorable conditions was the outbreak of World War I and the increase in farm prices. There was a newfound optimism on the project as expressed by one author in a November 1914 article: "The changes to be noted since my visit 12 months ago are marked and easily apparent all over the project. From Fernley to Stillwater, throughout the entire length of the project for which water is available, the area of new land brought into crop has increased to such an extent that one passes through a solid block of green which has replaced the gray wastes of sand and sagebrush" (Reclamation Record, November 1914, p. 415). In addition to growing the principal crop of alfalfa, farmers had diversified into dairy farming, and raising livestock, poultry, and pigs. Attempts were also made to develop a sugar beet and cantaloupe industry, both of which eventually proved unsuccessful.

The World War I years continued to bring prosperity to Newlands Project farmers as the demand for farm goods climbed and farm prices remained high. New settlers were attracted to the area and the amount of irrigated acreage increased. At the end of the war, returning veterans eager to settle down were attracted to the project. By 1920, the number of irrigated farms had risen to 742 (Reclamation, 23rd Annual Report, p. 64).

The Newlands Project not only resulted in the development of farms; it also spawned the growth of communities, in particular Fallon. Established as a direct outcome of the project, the new town was made the Churchill County seat in 1903. An influx of people thereafter quickly encouraged the construction of residences, commercial establishments, and schools. By 1906 there were four churches, in 1907 the first high school was opened, and in 1912, power generated at Lahontan Dam brought electricity to the community. By 1914, the town could boast "first-class waterworks, a complete sewerage system, and . . .churches, lodges, societies, banks, stores, two live newspapers, a sugar factory, creamery, and, last but not least, a moving picture theater" (Reclamation Record, November 1914, p. 416).

The decade following World War I years had its ups and downs for farmers on the Newlands project. An economic depression and water shortages resulting from low precipitation in the early 1920s had serious consequences for farmers, particularly around Fernley. A letter to recently appointed Reclamation Commissioner Elwood Mead printed in *The Fallon Standard* on November 19, 1924, described the dire conditions on the project, " Less than a third of this project is habited. Empty acres and an abandoned farm are tucked in next door to the project superintendent."[11]

Conditions on the Newlands project mirrored those on other Reclamation undertakings. On one third of the projects, water users fell further and further behind in their payments to the Federal government. The delinquencies were staggering. Some of the difficulties experienced by

[11] "An Open Field to Dr. Mead". *The Fallon Standard.* November 18, 1924.

farmers were a result of poor soil or an inadequate water supply. Other factors included poor farming methods or, in some cases, an outright resistance by farmers to pay, even if they had the ability. In the years spanning 1920-24, between 78 and 80 percent of the charges due to Reclamation from Newlands Project irrigators were paid (Reclamation, 24th Annual Report, 1924-25, p.4). Elsewhere, the payment rates were even lower.

The plight of Reclamation became so bad that the Secretary of the Interior appointed a Fact Finding Commission to investigate the entire program and make recommendations. On the Newlands Project, the commission determined that by 1926, a total of $7,899,479 had been spent by Reclamation. Of this amount, $4,437,820 had been expended without proper cause, and it was concluded that the water users should not be held responsible for repayment of those costs. The Omnibus Adjustment Act of 1926 relieved the water users of that amount and gave them forty years to repay the remaining $3,281,999 (Simonds, P. 9).

Other efforts undertaken to improve project conditions included investigations by Reclamation to determine the areas of land unfit for cultivation or for which the water supply was inadequate (24th Annual Report, p. 4). In 1925 and 1926, Reclamation classified the project lands into irrigable and non-irrigable lands and determined that the annual flow of the Truckee and Carson Rivers could irrigate an average of only 87,500 acres (Townley, p. 48).

Negotiations for the transfer of operation and maintenance of the project to the TCID began in 1921. Settlement of the repayment problem removed a major barrier and on December 31, 1926, the Secretary of the Interior approved a contract with TCID for the transfer of operation and maintenance responsibilities to the district. Total annual Newlands Project diversions from both the Truckee and Carson Rivers were set at 406,000 acre-feet, for the irrigation of, and not to exceed, 74,500 acres of land (Nevada Division of Water Planning, Carson River Chronology, p. 11). Since then, the District has been responsible for the operation and maintenance of the entire

Federal project.

By the latter half of the 1920s, conditions for farmers on the Newlands Project were improving. The 1928 Annual Report of the Secretary of the Interior stated that the "economic situation of settlers is better than it has ever been"(Extracts from the Annual Report Of the Secretary Of Interior, Fiscal Year 1928, p.19). Alfalfa was the principal crop but potatoes, grain, and livestock were also produced. These goods were shipped to nearby mining camps, the cities of San Francisco and Los Angeles, and sometimes even made their way to eastern markets.

The following year it was reported that the total number of irrigated acres had reached 49,900. The crop value generated from 681 irrigated farms was placed at 1.8 million dollars. The dairy industry was flourishing, and poultry and sheep raising were showing favorable results. "All project payments due to the U.S. were met promptly by the irrigation district and collections by the district from water users were good, with very few delinquents" (Reclamation, 28th Annual Report, p.19). The rebounding prosperity was short-lived, however; the combined effects of the disastrous economic downturn and drought of the Great Depression plunged farmers once again into severe financial straits.

THE DEPRESSION YEARS: CONTRIBUTIONS OF THE CIVILIAN CONSERVATION CORPS 1934-1942

By the early 1930s, the entire country was in the grips of the Great Depression and jobless men everywhere struggled to earn enough money to feed their families. Hundreds of thousands of young men from economically stricken households were unable to find work. An extreme drought plagued the western states and gave rise to the term "Dust Bowl." Nevada was no exception and conditions on the Newlands Project were grim. Water shortages brought on by drought withered the crops and forced many farmers off the land. Some suffered foreclosures while others sold their properties for pittances. The average farm income on the Newlands Project fell from $6,369 in 1928 to $1,931 in 1930. By 1931 conditions on all Federal reclamation projects had become so bad that Congress enacted a moratorium on all annual construction repayment charges for the next three years, then extended it during the late 1930s (Townley, p.68). To make it easier for water users to meet their operation and maintenance fees, the TCID Board permitted the users to pay the charges by working on the project ditches and canals. The situation on the project became even bleaker in 1932 when the average farm income dropped to only $900 (Townley, p. 68). That year, there were 700 farms and 2,883 people living on the project (Reclamation Era, June 1952, p. 131).

By 1933, the critical situation in the country prompted newly elected President Franklin Roosevelt to announce plans for a new program, the Civilian Conservation Corps (originally called the Emergency Conservation Works), aimed at conserving the nation's depleted natural resources and putting unemployed youth to work. Within a short time, CCC camps had been established across the country and young men were recruited to work on a myriad of conservation projects overseen by various Federal agencies including the Bureau of Reclamation. The peak of CCC enrollment was reached in the summer of 1935 with about one half million youths scattered in 2,652 camps. Each camp typically housed about 200 enrollees. When the program was terminated in June 1942, more than 2.5 million men had been enrollees in the 4,500 camps that existed at some point in the CCC's nine year lifespan. Reclamation operated 83 separate camps on 45 of its projects in 15 Western states.

Even though Reclamation's share of CCC camps was small, the benefits of the program to the agency were significant. Originally assigned to rehabilitate the storage, distribution, and drainage systems of older projects that had been seriously affected by the combination of drought and depressed farm prices, the camps broadened their activities to include developing supplemental water supplies and constructing new irrigation projects. The rehabilitation of older project facilities consisted of returning weed- and silt-filled canals and laterals to a proper cross section; replacing decaying wooden structures with concrete; adding new water control structures; building bridges over canals; eradicating weeds and rodents; reconditioning operating roads; placing riprap on canal and lateral banks, and sealing porous canals with earth or concrete linings.

Reclamation established its first nine CCC camps in the spring and summer of 1934. None were in Nevada. The following summer, the agency opened five camps in that state, two of which were assigned to the Newlands Project (BR-34 and BR-35). The three other camps were BR-36 in Lovelock on the Humboldt Project, BR-37 in Washoe City on the Truckee Storage Project, and BR-52 at Topaz Lake on the Walker Irrigation District. One other camp assigned to the Newlands Project (BR-21) also was established in the summer of 1935, but was located at Tahoe City in California. In May 1939, a second camp affiliated with the Truckee Storage Project (BR-92) was occupied for the first of three consecutive summers. The camp was located at Boca Dam, California.

Reclamation's five Nevada camps originating in 1935 were the only ones the agency operated in that state during the life of the CCC program. Elsewhere in Nevada, 54 camps existed at various locations during the nine years of the program's existence. These were distributed among the U.S. Forest Service (7), State or National Parks (6), the Biological Service (4), the Soil Conservation Service (6), the Division of Grazing (26), the Navy (2), and three user-funded irrigation districts.

Even prior to the establishment of the CCC camps on the Newlands Project, the TCID was the recipient of some emergency Civil Works Administration funds that enabled the district to perform urgently needed repairs. The monies also provided jobs to many project farmers who were badly in need of employment. Some of the work completed in 1934 under this program included installing about 40 concrete and redwood lateral structures, strengthening the banks of some laterals, removing trees and shrubs from canal and lateral banks, and straightening a portion of the "N" Line Lateral to eliminate curves (letter report on Federal Project No. F-69, January 29, 1934).

The three CCC camps on the Newlands Project were all involved with rehabilitating deteriorating storage, irrigation, and drainage features associated with the aging works. Both Camp Newlands, BR-34, and Camp Carson River, BR-35, were year around camps ready for occupancy in November 1935. BR-34 was within the city limits of Fallon and BR-35 was one quarter mile west of that city. During the first few years, enrollees from both camps were busy completing a large amount of neglected or postponed maintenance. They were also occupied with the construction and reconstruction, including enlargements, additions, and betterments, of a large number of various types of irrigation features. Major structures included the offstream "S" Line regulating reservoir, also referred to as Rattlesnake Reservoir, located two miles northeast of Fallon. It was finished in 1938. Also completed were a variety of small canal structures such as checks, culverts, and drops; metal flumes and pipe conduits; timber bridges; concrete canal linings; betterments at Lahontan Dam; and maintenance along drains and channels. Test and demonstration work relating to local irrigation engineering problems, and weed and pest control were also carried on.

In Federal fiscal years 1940 through 1942 the work program of previous years continued except that no maintenance work was undertaken. The construction of new structures and reconstruction of deteriorated structures was the main focus. This included drops, checks, turnouts, culverts, bridges, flumes, wasteways, concrete linings, earthwork, riprap, ditchtenders' roads, cattleguards, fences, and buildings. During the existence of the two camps, enrollees built 1807 canal structures, 14 flumes, and 64 miles of roads. The largest single project undertaken by the CCC was the partial construction of Sheckler Reservoir, 16,000 acre-feet capacity. This included building an embankment and reinforced concrete outlet structure. Enrollees also improved the Truckee Main Canal by removing silt from the bottom, and enlarging narrow sections to increase the capacity to 1,200 c.f.s.. This work was completed in conjunction with TCID. Among other activities were the repair of the Lahontan Dam spillways, construction of a rock wall as a guard rail at Lahontan Dam, fire fighting, and weed eradication. BR-34 ceased operations at the beginning of May 1942, and BR-35 closed in November 1941.

During the fiscal years 1936, 1937, and 1938, smaller side camps were operated from BR-34. These camps were located at Mason and Lake Topaz, Nevada, and at Boca, California. Work at Mason consisted of preparation work for the consolidation of three canals, riprapping and construction of water control structures. At Lake Topaz, enrollees worked on building a dike to increase the storage capacity of the lake. In August, 1938, a side camp of 75 men from BR-34 was established at Boca and operated until November of the same year. At that time, bad weather forced closure of the camp and the detachment returned to BR-34.

Camp BR-21, Camp Tahoe, was established as a summer camp and first occupied on July 24, 1935. The camp's duration was short; it closed in December of the same year. During the five months they were located there, however, the 180 enrollees accomplished considerable improvements to structures connected with the Lake Tahoe outlet gates, cleared and cleaned the outlet channel and adjoining land, and provided valuable assistance at the Boca dam site in connection with test pits, road work, and other preliminary work (Reclamation, Annual Project History, Truckee Storage Project, 1934-37, p. 111).

Although BR-37 (Camp Reno) and BR-92 (Camp Boca) were assigned to the Truckee Storage Project rather than the Newlands Projects, they are being mentioned here due to the close association between the two projects. Authorized in September 1935, the Truckee Storage Project was constructed to provide a supplemental supply of irrigation water to about 29,000 acres of land in the Truckee Meadows around Reno and Sparks. Project features include Boca Dam and Reservoir on the Little Truckee River, a tributary of the Truckee River. The reservoir stores water that is released into the Truckee River for irrigation use on the Truckee Storage and Newlands Projects.

First occupied in November 1935 by the enrollees of BR-21 when that camp shut down, BR-37 was continuously operated until it closed in August 1938. The camp was located about five miles south of Reno. Work conducted by the enrollees consisted primarily of rehabilitating features of the distribution system throughout the Truckee River Valley. Accomplishments included the installation of many canal structures of various types and of permanent materials, metal flumes, concrete lining to prevent loss of water by seepage, and rock riprap to prevent erosion. Considerable work was also done to improve the Truckee River Channel, including enlargement, straightening, and bank protection by riprap.

During most of the duration of BR-37, a crew was assigned to work at Boca Dam, some 30 miles away from camp. This work consisted of digging test pits, unloading and stockpiling concrete aggregate, clearing over 900 acres of the reservoir site, constructing roads to replace ones that would be inundated, and conducting a general clean-up of the premises in the vicinity of the dam which in prior years had been occupied as a townsite. CCC forces also completed a number of tasks at the dam once the contract work was finished. These included relocating the domestic water supply line of the town of Boca, improving the discharge channel of the Boca dam toe drain, placing riprap in the spillway and tunnel outlet channels, landscaping the gatetender's house and grounds, constructing a rock masonry parapet and timber rail curb wall across the dam, and establishing two weirs and stream gaging stations on the Little Truckee River.

BR-92, located at Boca Dam, was occupied in early May 1939 with enrollees transferred from BR-35 at Fallon. Camp Boca was a summer tent camp used only during months when the weather was suitable for reasonable living and working conditions. Enrollees were engaged in completing necessary or desirable improvements incidental to the construction of Boca dam and reservoir and not included in the construction contract. The CCC forces continued with some of the work started by BR-37 such as rerouting roads near the dam, constructing the stone parapet wall at the crest of the dam, and landscaping. They also constructed drainage shafts, pipes, and rock-filled trenches at the toe of the dam, placed riprap to protect slopes of outlet channels and roadway embankments, and razed unused and unsightly structures. Camp BR-92 was terminated in October 1941.

Although not as closely affiliated with the Newlands Project as the camps on the Truckee Storage Project, BR-36 on the Humboldt Project and BR-52 on the Walker Irrigation District were located in the same vicinity of the state. The Humboldt Project, located north of the Newlands Project, diverts water from the Humboldt River to irrigate about 40,000 acres in the Lovelock Valley. The project was approved by President Roosevelt in November 1935, and the enrollees of BR-36 helped out considerably in the construction of Rye Patch Dam and the distribution system. Camp BR-52 was located south of the Newlands Project at Topaz Lake. Work completed by the camp's enrollees assisted the Walker Irrigation District.

CONSTRUCTION OF ADDITIONAL STORAGE AND DIVERSION FACILITIES: 1935-1945

The drought years of the 1920s and 1930s prompted irrigators in the Truckee River basin to exert intense political pressure to construct more storage facilities. Farmers around Fernley taking water from the Truckee Canal were especially hard hit due to shortages (Townley, p. 49). Sufficient upstream storage on the Truckee River was a major deficiency of the project. The initial Newlands Project plan had contemplated building a dam and reservoir in Spanish Springs Valley, north of Reno, and by 1920, the Reclamation Service had decided to go ahead with construction. The agency abandoned the idea by 1926, however, upon encountering intense opposition from downstream water users who objected strongly to paying the additional costs of the storage facility. TCID asserted that the Federal government had guaranteed to provide adequate irrigation water as part of its existing contracts and that the government should, therefore, finance additional facilities (Townley, p. 49-50). Reclamation continued to evaluate other possible storage sites in the eastern Sierra but the search was not concluded until well into the next decade. The intervening years were fraught with heated disputes between owners of water rights along the Truckee River. During that time the Washoe County Water Conservation District (WCWCD) was established in June 1929, with lands totaling about 30,000 acres located around Reno and Sparks.

The realization of a storage project became one step closer in 1933 when the Public Works Administration authorized one and a half million dollars for Truckee River storage but insisted upon resolution of upstream water rights before releasing the funds. After lengthy and contentious arguments among the major water users including TCID, Sierra Pacific, and the Washoe County Water Conservancy District, an agreement between parties was finally reached and on June 13, 1935 the Truckee River Agreement was approved by Secretary of the Interior Ickes. This agreement established regulations for the maintenance of minimum rates of flow in the Truckee River during winter months, provided for development of pondage for reregulating fluctuations in streamflow occasioned by the operation of privately owned hydroelectric powerplants, and provided for development of a minimum of 40,000 acre feet of supplemental storage on the Little Truckee River by the WCWCD (Water and Power Resources Service, p. 1217).

On September 21,1935, the President authorized the construction of a dam on the Little Truckee River under the Truckee River Storage Project. The project purpose was to provide supplemental irrigation water to approximately 29,000 acres of land in the Truckee Meadows surrounding Reno and Sparks, Nevada. Although not part of the Newlands Project, Boca Dam made additional water available under some circumstances for irrigation of lands under the Truckee Canal.

The site selected for Boca Dam is in California on the Little Truckee River, a tributary of the Truckee River. The dam is located about one half mile upstream from the confluence of the tributary with the main river. Construction of Boca Dam began in April 1937, and was completed before the irrigation season of 1939. Funding was secured from the Public Works Administration and the WCWCD contracted to repay the cost. Although most of the construction was accomplished under contract, the Civilian Conservation Corps (CCC) completed ancillary work outside the scope of the contract. Boca Dam is a zoned earthfill structure, with a structural height of 116 feet, a top width of 35 feet, and a crest length of 1,629 feet. The spillway consists of a concrete-lined open channel at the left abutment controlled by two radial gates. The reservoir has an active capacity of 41,000 acre-feet.

Two previously mentioned, secondary downstream reservoirs associated with the Newlands Project, the "S" Line and Sheckler, also involved the CCC. The "S" Line regulating reservoir, with a capacity of 1,500 acre-feet, covers an area of about 502 acres. The reservoir provides a means of regulating the "S" Line Canal system, conserving irrigation water that otherwise would be wasted. The barrier forming the reservoir is an earthen dike 13.1 feet high with a crest length of 8,400 feet. A concrete structure with a 4-foot by 8-foot automatic metal gate was built to control inflow from the "S" Line Canal. A three-foot by three-foot concrete box with a metal slide gate was incorporated at the reservoir outlet. A short canal was constructed to deliver water from the reservoir back to the "S" Line Canal.

Scheckler Reservoir, located on the Carson River east of Lahontan Reservoir, has a capacity of about 16,000 acre-feet. The earthfill Sheckler Dam, begun in 1940 and not completed until 1957, has a structural height of 20 feet, and a crest length of 1635 feet. Provided with an inlet and outlet canal, the reservoir was designed to conserve the winter flow of water from Lahontan Reservoir. Water diverted from the "V" Line Canal into the reservoir during the nonirrigation season can be held for later use. At present, the reservoir is not in use. The Stillwater Point Dam, east of Fallon was constructed between 1942 and 1945. It is an earthfill structure 15.1 feet high with a crest length of 100.1 feet. Stillwater Point Reservoir has a capacity of 7,000 acre feet.

A few other secondary diversion dams have augmented the project since the 1930s. Coleman Diversion Dam and Sagouspe Dam, both on the Carson River about 12 and 18 miles, respectively, downstream from the Carson River Diversion Dam, were constructed between 1935 and 1945 by TCID. Both dams divert return flow to the canal system of the South Carson Division. Coleman Diversion Dam is a concrete weir structure with four radial gates, each one measuring 9 feet wide. The dam augments water into the "S" Line Canal through the "S" Line diversion channel. The dam was completely reconstructed in 1969. Sagouspe Diversion Dam is an earth structure measuring 12.1 feet high with a crest length of 399.9 feet and a diversion capacity of 38.8 cubic feet per second. A concrete gate structure controls the amount of water diverted.

By the close of World War II, the central features of the Newlands Project had been completed and another major legal agreement, the Orr Ditch Decree, had been executed. Enacted in 1944, the decree adjudicated Truckee River water rights and incorporated provisions of the 1935 Truckee River Agreement. Under the Orr Ditch Decree, the United States was granted a water right with a priority date of 1902 to divert 1,500 second feet of water from the Truckee River through the Truckee Canal to irrigate 232,800 acres of project land. Certain stipulations were placed upon the release and storage of water by the federal government (Reclamation, Preliminary Data on Water Supply, 1951) The decree also granted the Pyramid Lake Paiute Indian Tribe the two most senior rights on the river for irrigation purposes on 3,130 acres of bottom land and 2,745 acres on the benches, but no waters were allocated for lake preservation or restoration. Other provisions further defined water rights. While construction of the Newlands Project had been largely accomplished, the intense legal wrangling over water rights was far from over and continues to the present.

F. ASSOCIATED PROPERTY TYPES

As stated earlier, the Newlands Project in its entirety is significant for its association with the earliest Federally funded Reclamation project, for its association with the primary sponsor of the Reclamation Act, Francis G. Newlands, and for providing the irrigation water that determined the development and settlement patterns of the lower Carson River Basin. Due to the complexity of the project, however, and the disjunct nature of its many components, a multiple property National Register approach rather than a single district is considered most appropriate for recognizing significance.

National Register guidance documents define a property type as a "grouping of individual properties characterized by common physical and/or associative attributes" and consider it to be the key link between historic contexts and individual resources (National Park Service 1991). Property types associated with the Newlands Project consist of structures built for the storage, diversion, delivery, and power development of water. They include dams, water conveyance and control structures, powerplants, and pumping plants. In addition, properties may exist that are associated with the construction, ongoing operation and maintenance, and settlement of the project. Some of these properties are not under Reclamation's jurisdiction. No intensive survey of the Newlands Project has been conducted, therefore, it is not known to what extent all of the possible associated property types still remain.

Eligibility

For a property associated with the Newlands Project to be eligible for the National Register, it must meet one or more of the National Register criteria and it must retain integrity. The component may be an individual feature such as a dam or it may be a district such as a contiguous series of canals. A district must possess a significant concentration or linkage of resources that are united historically by plan, function, or physical development. A district should be a significant and distinguishable entity, although its component parts need not possess individual distinction.

Properties eligible under Criterion A must evoke or illustrate important historical events, themes, or patterns. As stated above, the project in its entirety has been pivotal in the history of the area it serves and in federal Reclamation history. For individual properties associated with the Newlands Project to be eligible under this criterion, they must strongly represent either of those themes. An individual canal may qualify for listing if it is key to the whole project. More likely, a district composed of main project canals and its ancillary features would qualify under Criterion A. On the other hand, properties such as minor laterals, water control structures, or privately built farm ditches would not likely meet this criterion.

To be eligible under Criterion B, a property must be associated with a person who made important contributions to history and must be a property that best illustrates those contributions. For example, a dam or powerplant that best exemplifies important contributions to engineering technology developed by a significant engineer may be eligible under this criterion. Likewise, the historic office building in which a prominent Reclamation engineer prepared his most important designs may be eligible. Although the entire Newlands Project is associated with Francis Newlands, component properties would not be eligible for association with him unless they best demonstrate his role and influence in passage of the Reclamation Act, or authorization of the Newlands Project. Irrigation systems and their associated components are not usually eligible under this criterion alone.

To be eligible under Criterion C, a property must demonstrate significant engineering or design values. Examples of different types, styles, periods or methods of construction; good examples of the work of an important engineer or architect; or properties of high artistic merit may qualify. Such properties include, but are not limited to, dams, canals, powerplants, water control structures, ditchriders' housing, or project headquarters. The earliest, best preserved, largest, or sole surviving example of a particular property type, or a property exhibiting an innovative or experimental approach to water engineering may be eligible. Under Criterion C, properties may have unique values or they may be good representative examples of a type of property. In the latter case, properties must possess "distinctive characteristics", the common features or traits of that type, period or method of construction. They must also retain a high degree of integrity.

Finally, properties associated with the Newlands Project may be significant under criterion D for the information they contain about important scholarly and scientific issues useful in interpreting the past. Some of the key research issues, for example, include historical changes in the Newlands Project landscape, settlement patterns, and water engineering technology. The properties most commonly found eligible under Criterion D are archeological sites, but buildings, structures, and objects can also, if infrequently, be found eligible for their information potential. In order for these other property types to be eligible under D, the physical properties themselves must be or have been the principal source of the important information.[12] Historic properties potentially significant under criterion D include the archaeological remains of construction camps such as Lahontan City, ditchriders' houses, experimental farms, and the like.

I. PROPERTY TYPE: STORAGE AND DIVERSION STRUCTURES

Description

A. Dams

Dams on the Newlands Project can be divided into two basic types according to their function:

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[12] JRP Consulting Services. *Water Conveyance Systems in California, Historic Context Development and Evaluation Procedures.* December 2000. P. 94.

storage and diversion.

Diversion Dams divert water into a conveyance system and may also serve to impound water for later use. Four diversion dams are incorporated in the Newlands Project. The first dam constructed on the Newlands Project also has the distinction of being the first on a Federal Reclamation project. Completed in June, 1905, Derby Diversion Dam diverts water from the Truckee River into the Truckee Canal. Carson River Diversion Dam, constructed between 1904 and 1905, diverts water from the Carson River five miles northeast and downstream of Lahontan Dam into the southside main Canal ("V", "L", and "S" Lines) and the northside main Canal ("T" Line). Two other diversion dams, Coleman and Sagouspe, were constructed later by the TCID but are part of the Newlands Project. Coleman Diversion Dam is situated downstream from the Carson River Diversion Dam and was constructed in 1935. Sagouspe Diversion Dam is situated downstream from the Coleman Diversion Dam and was constructed in 1940.

Storage Dams impound surplus run-off and flood flow waters and store them for long-term use. Such dams can be built to serve one or more purposes. Three main storage dams are associated with the Newlands Project. The earliest of these is Lake Tahoe Dam, completed in 1913 at the outlet of Lake Tahoe into the Truckee River. Lake Tahoe Dam increases the water storage capacity of Lake Tahoe and regulates the flow of water from the lake into the Truckee River. The second storage dam to be constructed in the Newlands Project is Lahontan Dam, built between 1911 and 1915 at the lower end of Carson River. Lahontan Dam impounds water from the Carson River drainage basin as well as water diverted from the Truckee River via the Truckee Canal.

A third storage dam is sometimes included in discussions of the Newlands Project although technically not a part of it, and not being considered as part of this nomination. The Truckee Storage Project constructed Boca Dam between 1937 and 1939 on the Little Truckee River about one half mile above its junction with the Truckee River. Boca Dam collects and stores water from the Little Truckee drainage basin, regulates its flow into the Truckee River, and provides supplementary irrigation water for the Truckee Meadows.

In addition, the Newlands Project includes five small storage dams. The CCC built the "S" Line Canal Dam and part of Scheckler Dam between 1935 and 1942. Three other small storage dams were added later. These include the Stillwater Point Dam (1945), Ole's Pond Dam (1954) and Harmon Pasture Dam (1957).

B. Dikes

Dikes are built to fill in low-lying areas in order to create reservoirs, or so that capacity can be increased. A four foot high earthen dike at Lahontan Dam extends in a southward direction for three-quarters of a mile. The "S" Line Reservoir Dam is sometimes referred to as an earthen dike.

C. Reservoirs

Associated with storage dams are the reservoirs created behind them. These range in size from a capacity of 1,500 acre-feet ("S" Line Regulating Reservoir) to 732,000 acre-feet (Lake Tahoe). In addition to providing storage for Newlands Project water, Lake Tahoe and Lahontan Reservoirs also serve recreational users. Tourists were attracted to the sparkling blue waters of Lake Tahoe long before Reclamation built a dam there. On December 13, 1928, Governor Fred Balzar issued a proclamation setting aside lands near Lahontan Reservoir for a "state recreating ground and game refuge" (National Archives, RG115, Entry 7, Box 785).

Significance

As the primary purpose of the Newlands Project is to collect and divert water from the Truckee and Carson Rivers for irrigation in the Fernley and Fallon vicinity, the associated storage and diversion facilities are central features. In addition to the pivotal role they play in irrigation, the dams also provide flood control and, at Lahontan Dam, store water for power generation. Without these key components of the irrigation system, the Newlands Project could not exist. Eligible dams in the Newlands Project are most likely significant under Criterion A for their association with the earliest federally funded Reclamation Project and for their association with the agricultural development of the lower Carson Basin. From an engineering standpoint, dams on the Newlands Project are not as dramatic in scale or design as other Reclamation dams such as Tieton on the Yakima Project or Stony Gorge on the Orland Project. At least one Newlands Project dam, however, represents a significant engineering accomplishment for its unusual spillway design and that is Lahontan. Dikes play a secondary role to dams in storing water.

Registration Requirements

The period of significance for dams begins in 1903 with the start of construction on Derby Dam and ends in 1945 with the construction of Stillwater Point Reservoir. While all of the dams play an important role in the operation of the Newlands Project, one or more may qualify as individually eligible for the following reasons:

Criterion A: They are demonstrably associated with the agricultural development and settlement patterns of the area; played a determining role in the history of the Newlands Project or Reclamation Service; or created key storage reservoirs associated with the Newlands Project.

Criterion B: They best represent the important contributions of someone significant in engineering or Reclamation history, or in the overall realization of the Newlands Project.

Criterion C: They exemplify the distinctive characteristics of a certain type of dam or method of construction; they embody the work of a significant engineer or builder; they dominate the project in terms of their size and key function; they represent the evolving technology of dam design or an innovative design solution.

Dams require continual maintenance and periodic repairs to keep them operating safely and efficiently. Oftentimes, parts such as gates or valves are replaced due to wear or improved technology. Considerations of integrity must take this account. For a dam to be eligible for the National Register, it obviously must retain integrity of location. The overall design, workmanship, and materials must remain intact; if elements have been altered they cannot change the character, functioning or design to the extent that the original is no longer readily apparent. If a dam is eligible for significant engineering innovations or technology, those features must still be present. The current setting should embody the same overall character as the historic setting, with minimal visual or physical intrusions. This aspect may be less critical if a dam is being nominated under Criterion C for engineering significance. If the elements of design, workmanship, materials, and setting are intact for a dam, then integrity of feeling and association will also be maintained.

Dikes are normally secondary elements and would not be considered individually eligible unless they meet the criteria described above. Reservoirs are also considered secondary and could be nominated in conjunction with a dam.

II. PROPERTY TYPE: WATER CONVEYANCE STRUCTURES

Description
Another core component of the Newlands Project are the conveyance structures used to carry water from the storage and diversion facilities to the farmlands. They include about 69 miles of main canals and 312 miles of laterals that deliver water from the main canals to irrigation ditches on the farms. Also falling within this property type are about 345 miles of drains that carry excess water away from farm fields. Canal right-of-ways usually include maintenance roads on

one or both sides.

Associated with the many miles of canals, laterals, and drains are numerous types of appurtenant features that play an integral role in the delivery of water. Most are small in scale, yet they are instrumental to the functioning of canals and laterals. Although these appurtenant features are all thematically and operationally related to canals/laterals/drains, they can be divided into five categories according to their specific purpose: conveyance, regulating, water measurement, protective, and miscellaneous structures. For the most part, these features derive significance as contributing elements to the operation of canals, laterals, and drains. In rare instances, they may warrant individual eligibility due to a significant or innovative design or construction technique, and/or due to the major role they play.

A. Main Canals

The main canals form the primary arteries of the Newlands Project water distribution network. The original main canals, totaling about 69 miles in length, consist of the Truckee, the "V" Line and the "T" Line. The other prime lettered canals in the Newlands Project are also sometimes considered to be main canals. They include the "A", "D", "E", "G", "L", "N", "R", and "S" Line Canals. Rock Dam Ditch 1 and 2 are short main canals situated shortly downstream from Lahontan Reservoir. Main canals range in length from a little over two miles ("N" Line Canal) to 32 miles (Truckee Canal) and have cross-sections that range from 60 square-feet ("T" Line Canal) to 260 square-feet (Truckee Canal). They have diversion capacities (water flow rates) ranging from 450 cubic feet per second ("T" Line Canal) to 1,500 cubic feet per second (Truckee Canal).

The first canal constructed was the Truckee Canal which carries water from Derby Diversion Dam 32 miles to Lahontan Reservoir. The canal also irrigates about 20,000 acres of farmland in the vicinity of Wadsworth and Fernley. The proposed Pyramid Branch lateral canal, which was planned to be constructed six miles from the Derby Dam headworks, apparently was never built. The two main canals built to carry water from the Carson River Diversion Dam were also completed by 1905. Called the southside and northside canals, they are often referred to as the "V" Line Canal and "T" Line Canal, respectively. Construction of the other main canals followed. They are of two general types of cross-sections: concrete-lined and unlined. Very little of the original canal system was lined; in fact, a 1914 summary report indicates that only 2.46 miles were concrete lined. During the 1930s the CCC enrollees were responsible for lining considerable stretches of canal. By 1938, they had completed 8,300 linear feet.

B. Laterals and their Branches

Laterals are small irrigation channels that branch off of main supply canals. On the Newlands Project, laterals or their smaller branches, sometimes referred to as sub-laterals, carry water to the approximately 1,000 individual farms in the project area. There are about 150 laterals on the project that together comprise about 500 miles. Laterals vary in length from as little as 250 feet up to about 8.5 miles, with 126 of them measuring at least one mile. The first laterals were constructed in 1904 (Simonds, p. 11). There are at least 20 sub-laterals on the project and some of these have even smaller branches, which are designated as sub-sub-lateral canals.

C. Appurtenant Canal Structures: Conveyance, Regulating, Water Measurement, Protective and Miscellaneous

Until an intensive survey is conducted of the Newlands Project canals and laterals, the existence and number of each of the following appurtenant canal structures remains unknown. Research does reveal that many of the original appurtenant structures were constructed of redwood. In 1914, there were a total of 1810 canal structures. Among these were 18 culverts (14 wood, 4 terra cotta), 24,052 linear feet of pipe (3/4 of which were terra cotta), and three flumes (two metal, one wood (fishway at Derby Dam). In addition there were 142 bridges of which 128 were timber, two were concrete and 12 were a combination of materials. A major rehabilitation and reconstruction program of appurtenant canal structures occurred in the 1930s. Many of the wooden features were replaced by the Civil Works Administration (CWA) or CCC either with the same material or concrete. In late 1933 and early 1934, the CWA was responsible for completing 8 concrete structures in laterals, 11 redwood structures in laterals, and replacing one old redwood culvert with metal pipe. As of May 1938, CCC enrollees had removed 700 rotting redwood structures. They had built 157 concrete checks; 298 concrete takeouts; one concrete drop; one concrete chute; 17 concrete culverts; one concrete spillway; 35 redwood checks; 133 redwood takeouts; 52 redwood drops; 76 redwood wasteways; 133 redwood culverts; 17 cattle guards; and 23 bridges varying in length from 20 feet to 230 feet. Enrollees had also constructed metal flume and pipe conduits with a total length of 2,600 feet. These pipes and flumes replaced wooden structures or shortened the distance irrigation water had to be carried (Reclamation, Report on the Newlands Project, May 1938, p. 8).

1. Conveyance Structures

Conveyance structures are features such as road crossings, inverted siphons, drops, chutes, flumes, tunnels, and pipelines that are used to safely transport water from one location to another traversing various existing natural and manmade topographic features along the way. The four tunnels along the Truckee Canal were major conveyance structures built during the earliest period of project construction.

2. Regulating Structures:

Regulating structures are used to raise, lower, or control the release and volume of the water flow. Regulating structures that are located at the source of the water supply include headworks and turnouts. Headworks control the release of water into the canal and are often located just upstream from a diversion or storage facility. Regulating structures located along the course of a canal include turnouts, checks, check-drops, and division structures. The smaller regulating structures, such as checks and turnouts, are basic components of an irrigation system and are numerous. Presently, there are 1600 active turnouts that deliver water to users (conversation with David Overvold, Truckee-Carson Irrigation District).

3. Protective Structures

Protective structures protect the canal system and adjacent property from damage which would result from uncontrolled storm runoff or drainage water, or an uncontrolled excess of flow within the canal. Several different types of structures perform this function including overchutes, drainage inlets, siphon spillways, overflow spillways, and wasteways.

4. Water Measurement Structures

Water measurement structures are used to gauge water flow and ensure its equitable distribution. Many different types of water measurement structures are used in irrigation systems. The type most commonly used in Reclamation systems are Parshall flumes, weirs, open-flow meters, and constant head orifices.

5. Miscellaneous Canal Structures

In addition to the ancillary structures described above, a number of other features are oftentimes associated with canals. These include bridges, fencing, and gates along canal operating roads.

E. Drains

Drains are water conveyance structures (either open channels or buried pipes) that carry excess water away from irrigated agricultural fields to prevent rising water tables. Drains have played a critical role in the history of the Newlands Project; the failure to incorporate an adequate number of them and at the proper depth in the initial construction phase nearly caused the project's failure. A major drainage construction project was initiated in 1921 and was completed in 1928. Thereafter, drains continued to be built to relieve sporadic drainage problems. As of 1981, the Newlands Project included 345 miles of open drains (USDI Water and Power Resources Service

1981: 689). Since then, many of the open drains have been replaced with buried pipeline.

A drain classification was instituted by Reclamation by 1920 that categorized drains into three classes according to their size and relative importance. Class I or "deep drains" are the largest and most significant with Class III drains being the smallest. The typical size of Class I drains constructed between 1921 and 1928 is 10 feet deep and 9 feet wide at the bottom. The length of drains in the project varies from about 299 feet (Carson Lake 1 BR-2) to about 12 miles (L Deep Drain, Lower Diagonal Deep Drain). One hundred and twenty drains are one mile or more in length.

Significance

In conjunction with storage and diversion dams, canals form the backbone of the Newlands Project. They provide the means to transport and deliver water through the system and ultimately to the water users. Traveling for miles, the canals form a significant feature of the landscape and define the geographical limits of the project.

The need for continual maintenance and repairs to canals requires special consideration of integrity. Irrigation systems are constantly evolving as features are upgraded, repaired, or replaced. Alterations made to canals during the period of significance and even subsequent to that may not dismiss eligibility if a canal retains certain basics. Most important are integrity of association, location, and overall design configuration (depth, width). A canal which has retained its original form and associated appurtenant features has a high degree of integrity. It is not uncommon for canal lining to be replaced, or for previously unlined segments to be lined. Such changes may not preclude a canal's eligibility if they do not significantly damage the canal's historical association or its overall design. If in addition to integrity of association, location, and overall design, the historical setting and feeling of a canal are maintained, then the likelihood is even higher that an altered canal would be eligible. On the other hand, if an entire canal is piped, it would no longer convey any of its original design, workmanship, materials, or historical association and would not be contributing. Partial piping of a significant canal may not preclude eligibility if a majority of the canal is still open and intact. Even abandoned canals may be eligible if the original alignment remains visible and the feature still conveys historical associations with the Newlands Project.

Secondary to the canals in distributing water are the laterals and appurtenant features. As with canals, many of the appurtenant features are upgraded, altered, or even replaced over time due to the constant ongoing maintenance needs. As a result, those that remain with a high level of integrity are contributing elements to the larger system if they are associated with the period of significance. For laterals to be considered contributing, they must exhibit a high level of integrity, and serve as principal laterals or incorporate a large number of contributing appurtenant features. Because of the vast number of appurtenant features and the many miles of laterals, it may only be appropriate to identify representative examples as contributing elements. In unusual cases, laterals and appurtenant features may have individual significance if they are: rare surviving examples of a type of design or construction; of innovative engineering design that impacted subsequent designs; or were specifically designed to meet an unusual engineering challenge. Sub-lateral canals and their branches are not considered contributing resources and would not be individually eligible.

The evaluation of significance of drains is similar to that of laterals. The principal drains, or Class I drains, are contributing features if they retain a high level of integrity and fall within the period of significance. Class II and III drains are not considered contributing resources. In unusual cases, drains may have individual significance if they fall within the period of significance and are: rare surviving examples of a type of design or construction, of innovative engineering design that impacted subsequent designs, or were specifically designed to meet an unusual engineering challenge.

Registration Requirements

The period of significance for water conveyance structures begins in 1903 with the start of construction of the Truckee Canal and ends in 1942 with the termination of the Civilian Conservation Corps program.

Water conveyance structures with adequate integrity are considered individually eligible for the National Register for the following reasons:

Criterion A: They have had a significant impact on the settlement, agricultural economy, or development patterns of the project area; they have been defining elements in the evolution of the cultural landscape; they are directly associated with important events

Criterion B: They are the result of the direct efforts of a prominent individual associated with the Newlands Project and are the most prominent feature associated with that individual.

Criterion C: They represent the distinctive characteristics of Reclamation canal design and/or methods of construction used on the Newlands Project; they involved challenging engineering design problems due to topography, grade, natural obstacles, and resulted in complex or innovative solutions; they are among the best or a rare surviving example of a distinctive type of water conveyance structure; they represent the evolving technology in the design of water conveyance structures; they were identified during the construction period as an individually significant feature; or they embody the work of a significant engineer or builder.

Criterion D: They have the ability to yield information important to understanding the history of the Newlands Project.

III. PROPERTY TYPE: POWERPLANTS

Description

In addition to the primary purpose of providing irrigation water, the Newlands Project produces hydroelectic power. The Lahontan powerplant was constructed in 1911 and was initially used as a source of power during the construction of Lahontan Dam. Upon completion of the dam, the power supplied electricity to the surrounding rural area including the communities of Fernley, Wadsworth, Hazen, and Stillwater. A second powerplant consisting of two diesel-powered generators was added at Lahontan Dam by TCID in 1949. Both generators have since been removed. A third power facility, the "V" Line Canal Powerplant, was completed by TCID in 1955. This poured concrete plant was equipped with two 400 kw generators.

Equipment associated with powerplants includes, but is not limited to, turbines, penstocks, generators, outlet pipes, transformers, control panels and transmission lines. The original transmission line built by Reclamation in 1912 was later abandoned. TCID built and paid for 73 miles of 33-kilovolt transmission lines from the Lahontan powerplant to the city of Fallon; the towns of Fernley, Wadsworth, Hazen, and Stillwater; Indian reservations; and most of the rural areas of the project.

Significance

Although the primary purpose of the Newlands Project is to deliver irrigation water, the production of power has been a secondary benefit. For the role they play in generating electricity, powerplants are, therefore, significant to the project.

The same issues surrounding integrity of conveyance systems apply to powerplants. They require periodic maintenance and repair. In some cases, equipment is replaced due to malfunction, deterioration, or evolving technology. This is part of the ongoing evolution of a powerplant and does not necessarily preclude eligibility. Eligible plants will retain integrity of most of their components so that the significance of the total system and the essential character is preserved. If the significance of a plant is based on a specific piece (s) of equipment that has been removed, the plant would no longer be eligible.

Registration Requirements

The period of significance for powerplants begins in 1903 and ends in 1915, with the completion of Lahontan Dam. The only plant constructed during that time frame is the original Lahontan Plant which is already listed in the National Register.

IV. PROPERTY TYPE: PUMPING PLANTS

Description

Pumping plants are needed to lift water to a higher elevation to serve a desired purpose such as expanding the land area available for irrigation. The primary pumping plant associated with the Newlands Project was the one constructed at Lahontan Dam in 1924. It was built to allow water to be delivered to the Swingle Bench District. Consisting of two 500 horsepower units, the plant pumped water from Lahontan reservoir into the Truckee Canal until water backed up to the canal outlets at Swingle Bench. The project abandoned the pumping plant in 1971, and it no longer exists. Another example of this property type is the Stillwater pumping plant located at the "S" Line Canal bifurcation where the "R" Line takes off. Pumps lift water from a drain into the "S" Line Canal. The construction date of this plant requires research. An inactive pumping plant is located where the "L" Drain crosses the "A" Line Canal. Water used to be pumped from the drain back into the "A" Line Canal; the pump has been removed but the diversion structure is still in place (conversation with David Overvold, Truckee-Carson Irrigation District).

Significance

The period of significance for pumping plants extends from 1903 through 1942, the same dates as for water conveyance structures. Pumping plants are significant for making possible the delivery of water into otherwise inaccessible areas. Pumping plants can also be significant as engineering features and can represent innovative technological and engineering advances.

Pumping Plants are individually eligible for the National Register for the following reasons:

Criterion A: They are significant in the social, economic, or industrial development of the area

Criterion B: The are the direct results of a prominent individual associated with the Newlands Project and best embody the contributions of that individual

Criterion C: They are significant in the history of pumping plant engineering, in the history of pumping plant design principles, or in the development of construction techniques; they are an innovative or rare surviving example of a type of pumping plant; they are significant representative examples of a Reclamation-designed pumping plant.

V. PROPERTY TYPE: AUXILIARY CONSTRUCTION WORKS

Description

This property type encompasses auxiliary features required for the construction of the Newlands Project. This includes, among other things, government and contractor residential camps, construction plants, new and relocated roads, quarry sites, and telephone lines. Because no intensive research or survey work has been conducted on this property type, it can be discussed only in general terms.

A. Residential Construction Camps

Construction of the Newlands Project involved the labor of hundreds of men. Because of the remote location of much of the project, housing had to be provided for many of the workers near the construction activities. Residential camps were quickly erected and then dismantled upon completion of specific features. Further research is required to identify the number and locations of all Newlands Project camps.

Residential construction camps are known to have existed at Derby Diversion Dam, Lahontan Dam, and along the Truckee Canal. Other small camps were temporarily set up in association with the construction of other canals and laterals. Typically, camps included an array of structures such as tents, barracks, mess halls, kitchens, and bathhouses. The larger ones such as "Lahontan City", the camp at the Lahontan Dam site, were more like small communities and included amenities such as a billiard hall, barber shop, and library. It is assumed that no standing structures remain at any of the temporary residential camps and it is unknown whether any of them have the potential to yield as historical archaeological sites.

In addition to the camps associated with the original construction of project features, camps were also built to house the Civilian Conservation Corps enrollees working on the Newlands Project in the 1930s and early 40s. Camp Newlands, BR-34, was located in the city limits of Fallon on a portion of the Newlands Project Facility Yard at 6th and Taylor. This is documented in a Historic American Engineering Record report completed on the Truckee-Carson Irrigation District Facility Yard in 1984. Camp Carson River, BR-35, was located one quarter mile west of Fallon. Both of these camps were year around and housed about 200 men. Among the buildings were barracks, mess halls, kitchens, recreation halls, officers quarters, infirmaries, and headquarters. Camp BR-21, located at Tahoe City, California was a summer camp and of tent type construction. It was built on federal land although it is not known whether under Reclamation jurisdiction. All three camps have been dismantled, and it has been field verified that nothing remains of BR-34 and BR-35. The site of BR-21 needs to be visited. Two other Reclamation CCC camps, BR-37 and BR-92, were established in the area although both were assigned to the closely related Truckee Storage Project.

B. Roads

In addition to the miles of roadways constructed along the banks of canals for operation and maintenance purposes, access roads were required to reach remote construction sites. Although more research needs to be done to establish where roads were built on the Newlands Project, it is known that by 1914 Reclamation had laid down 64.5 miles of roadway. No railroad lines had been built.

C. Construction Plants

Construction of major project features required large amounts of equipment, machinery, and construction-related facilities at the site. It is known, for example, that at the Lahontan Dam site there was a cement mixing plant, gravel screening plant, and blacksmith, machine and carpenter shop. None of the facilities at Lahontan Dam or at other large construction sites are known to remain. Further research is required.

D. Quarries and Borrow Areas

The use of concrete, earthfill, and riprap in the construction of many project features required sources for the materials. To the extent possible, quarries and borrow areas were located close to the construction site. This was true for Lahontan Dam. Further research is required to identify the locations of quarries and borrow areas.

E. Telephone Lines

Because of the remote and undeveloped locations of many project features, it was necessary to build telephone lines in order to establish communication between the field and headquarters.

The first line was strung in the spring of 1906 along the "T" Line Canal. By August 1906, 70 miles of metallic circuit had been constructed by Reclamation in Carson Sink Valley and along the main canal. In addition, 14 miles were complete and in operation between Tahoe and Truckee. More lines followed; by 1913, 128 miles had been finished on the project and 58 telephones were in service.

Significance

Accomplishing the construction of the Newlands Project required an array of support and ancillary features. Although typically not as visible or permanent as primary structures, these secondary features were instrumental to the successful completion of the project. Construction camps were significant for their role in housing hundreds of workers in fairly remote locations. The camps also represent "microcosm" communities, usually offering services and amenities in addition to housing. The camps on the Newlands Project were among the first on Reclamation projects and could reveal much about the early workforces and design of camps. The CCC camps are significant for their association with one of the most popular and successful of all Roosevelt's New Deal programs. Other ancillary features are significant when they contribute to telling the "whole story" of the project and represent important physical features added to the landscape.

Registration Requirements

The period of significance for auxiliary construction features begins in 1903 and ends in 1945 with the completion of major project facilities. Residential and construction camp buildings were frequently dismantled or moved to new locations once a project feature was completed. As a result, it is highly unlikely that any camp structures exist on the Newlands Project. If such a structure is identified and has integrity of location, materials, workmanship, and design, it may be significant. The possibility of archaeological remains of camp sites yielding information needs to be assessed.

Quarries, borrow areas, roads, and other auxiliary features are unlikely candidates for individual eligibility. They may qualify as contributing elements to a district including one or more major features with which they are associated. Quarries and borrow areas would require historical significance other than just providing construction materials for individual eligibility. Likewise, roads and telephone lines would require special design features or represent a significant engineering feat to qualify for individual eligibility.

Auxiliary construction works with sufficient integrity are considered individually eligible for the following reasons:

Criterion A: They had a unique and significant function related to the construction of the Newlands Project or they were the site of a significant event associated with the Newlands Project

Criterion B: They best represent the important contributions of someone significant in engineering or Reclamation history, or in the overall realization of the Newlands Project. Highly unlikely.

Criterion C: They are the best or only surviving representative example of a primary type of structure associated with the construction of the Newlands Project, such as a camp bunkhouse; they are of unique design or construction; or they have engineering significance.

Criterion D: The archaeological remains of construction camps and plants may be eligible if they yield information important to understanding the operation, activities, and people involved in building the Newlands Project. Archaeological materials may provide information about life in construction camps and ethnic participation.

VI. PROPERTY TYPE: ONGOING SUPPORT FEATURES

This property type encompasses features that were constructed for the operation and maintenance of the irrigation system once it was placed in service. Beginning January 1, 1927, the TCID assumed responsibility for the operation and maintenance of the project. Examples of this property type include features previously identified under Auxiliary Works, such as construction camps and quarry sites, if they continued to be used for the operation and maintenance of the system. This property type also includes structures such as dam tenders' and ditch riders' housing, project offices, and service yards.

A. Project Offices

Project offices serve as the ongoing administrative headquarters for project oversight. During construction of the Newlands Project, project headquarters were initially in Hazen. In December 1906, they were moved to temporary office space in Fallon. On November 24, 1909, the Secretary of the Interior awarded a contract for construction of permanent headquarters in Fallon. A complex of buildings was constructed including an office, office annex, and conference building. In addition, eight automobile shelters were situated on the grounds. The buildings no longer exist.

B. Service Yards

Service yards contain the buildings and equipment necessary to provide ongoing support, maintenance, and repairs to project machinery and features. Typically, service yards contain warehouses, storage buildings, machine shops, repair shops, and garages. These buildings are industrial and utilitarian in appearance. The headquarters complex in Fallon included a repair shop and oil house, presumably to service the automobiles stored there. In 1919, a facility yard was built in Fallon near the Fallon Freight Depot at 6th and Taylor to consolidate all of the main operations and maintenance activities at one locality. A HAER report was completed on the history of the facility in October 1984. At the time, nine buildings still existed at the site. They have since been razed. Further research is needed to identify other service yards.

C. Damtenders' and Ditchriders' Housing

Housing for ditchriders and damtenders is common to older irrigation projects, and the Newlands Project is no exception. In August 1907, it was reported that ditchriders's houses were generally completed for the entire system. In 1913, it was reported that 12 ditchriders' houses existed on the project. The location and status of these structures is unknown. Likewise, it is unknown if and how many damtenders' houses were built on the project.

Significance

A variety of maintenance and office facilities are essential to the ongoing operations of the Newlands Project. Constant and extensive upkeep involves an array of equipment requiring storage and work space. The "hands-on" labor involved in maintaining an irrigation system, especially in earlier days, required that ditchriders and damtenders be housed close to project facilities. Although typically not of the scale or significance of primary engineering features, the ongoing support facilities collectively have an important role. Typically these structures (with the possible exception of project offices) are inexpensively constructed, utilitarian, and plain. Sometimes they are of standard Reclamation design.

Registration Requirements

The period of significance for ongoing support structures spans from 1904 through 1927 when the TCID assumed operation and maintenance responsibilities. To be individually, ongoing support structures must have integrity of location, association, design, workmanship, and materials. They may be eligible for the following reasons:

Criterion A: They had or continue to have a unique and significant function related to the ongoing operation and maintenance of the Newlands Project, such as the project administrative headquarters; they were the site of a significant event associated with the Newlands Project.

Criterion B: They best represent the important contributions of someone significant in engineering or Reclamation history, or in the overall realization of the Newlands Project. Highly unlikely.

Criterion C: They are the best or only surviving representative of a type of support structure found on the Newlands Project; they are of unique design or construction; or they are a good representative example of a standardized Reclamation design.

Criterion D: They have the ability to yield information important to understanding the history of the Newlands Project.

VII. PROPERTY TYPE: SETTLEMENT FEATURES

This property type includes features built privately, by other public entities, and by Reclamation to support the settlement of project lands. Reclamation played a role in promoting the economic and social development of its projects once irrigation water was available. Under the Town Sites and Power Development Act of 1906, the agency was authorized to withdraw lands for townsites, subdivide them into lots, and sell them to the public. Reclamation also donated withdrawn lands for schools, community centers, and parks. In cooperation with the Department of Agriculture, it established experimental farms to demonstrate the growth of different types and varieties of plants.

Included under this property type could be townsites, community buildings, schools, and experimental farms constructed on lands withdrawn by Reclamation. Also falling into this property category could be irrigated farms established by settlers on project lands. Further research needs to be conducted to determine the role Reclamation played in the settlement of the Newlands Project and the extant properties associated with this theme. It is known that the Truckee-Carson Reclamation Project Experiment Farm near Fallon was established in 1906. A 1915 brochure published by the Department of Agriculture includes a site plan showing plots of alfalfa, grains, barley, and vegetables.[13] Later, the University of Nevada, Reno, took over the experimental farm as part of its extension service.

Significance

Settlement features reflect the outcome of developing an irrigation project and can attest to its success or failure. Since the intent of the Reclamation Act was to promote settlement of the arid West, features associated with settlement are integral to the significance of the project. More than likely, features of this property type are not Reclamation-owned, and nomination would need to be initiated by private interests or other public entities. Further research into this property type is needed.

Registration Requirements

The period of significance for settlement features spans from 1904 through 1929. To be individually eligible, settlement features must have integrity of location, association, design, workmanship, and materials. They may be eligible for the following reasons:

Criterion A: They were the site of a significant event associated with the Newlands Project; they are representative of the .

[13] See Bureau of Reclamation. Newlands Project History, Outline History 1906-1914. National Archives, Denver. Box 98, Accession 8NN-115-90-011.

Criterion B: They best represent the important contributions of someone significant in the growth and development of agriculture in the Truckee-Carson River basins.

Criterion C: They are an outstanding or only surviving representative of a type of settlement feature found on the Newlands Project; they are of unique design or construction; they embody the distinctive characteristics of a type, period, or method of construction; or represent the work of a master architect, builder, or engineer.

Criterion D: They have the ability to yield information important to understanding the history of the Newlands Project.

G. GEOGRAPHICAL DATA

The geographical limits of the Newlands Project Multiple Property Documentation Form include lands in California and Nevada including parts of the following counties: Washoe, Storey, Lyon, and Churchill in Nevada; and Placer County, California.

H. SUMMARY OF IDENTIFICATION AND EVALUATION METHODS

The Multiple Property Documentation Form for the Newlands Project is based primarily on research as well as limited fieldwork. The foundation for the document is a report entitled "The Newlands Project, Nevada: Evaluating National Register Eligibility" prepared in July 2001 for the Bureau of Reclamation's Mid-Pacific Region. Authors of the report were Donald L. Hardesty and Larry Buhr. They relied heavily on two sources: Reclamation historian Joe Simonds' 1996 draft report on the Newlands Project and John Townley's Turn This Water Into Gold, The Story of the Newlands Project (1998). In association with their research, Hardesty and Buhr conducted limited fieldwork to assess some of the project canals and laterals, mainly around Fallon.

To complete the Multiple Property Documentation Form, additional research was conducted primarily to develop the following sections: Origins of the Federal Reclamation Program, Francis G. Newlands and Passage of the Reclamation Act of 1902, and Beginnings of the Newlands Project. Research also yielded information on property types and specific properties associated with the project. Much of this information was obtained from government documents on the Newlands Project located at the National Archives in Denver. Limited fieldwork of some of the major project features was conducted in association with the research.

The information on the origins of the Federal Reclamation program, passage of the Reclamation Act, and beginnings of the Newlands project, provide the necessary background to place the project in a broader national context and to establish the project's significance. The properties are then grouped into five contexts organized according to major construction periods and theme. These are Planning and Construction of Major Project Features 1902-1915; Continued Construction: Drainage Facilities and Project Repairs: 1916-1928; Project Settlement and

Economic Development: 1904-1929; Civilian Conservation Corps Contributions: 1933-42 and Construction of Additional Storage and Diversion Facilities: 1935-1945. The end of World War II and the completion of a number of secondary diversion and storage dams in 1945 provide a logical cutoff date for the period of significance.

Property types were organized according to function. Seven different categories were identified: Storage and Diversion Structures; Water Conveyance Structures; Powerplants; Pumping Plants; Auxiliary Construction Works; Ongoing Support Features; and Settlement Features. Requirements for integrity were based on limited fieldwork and similar studies completed for other Reclamation irrigation projects.

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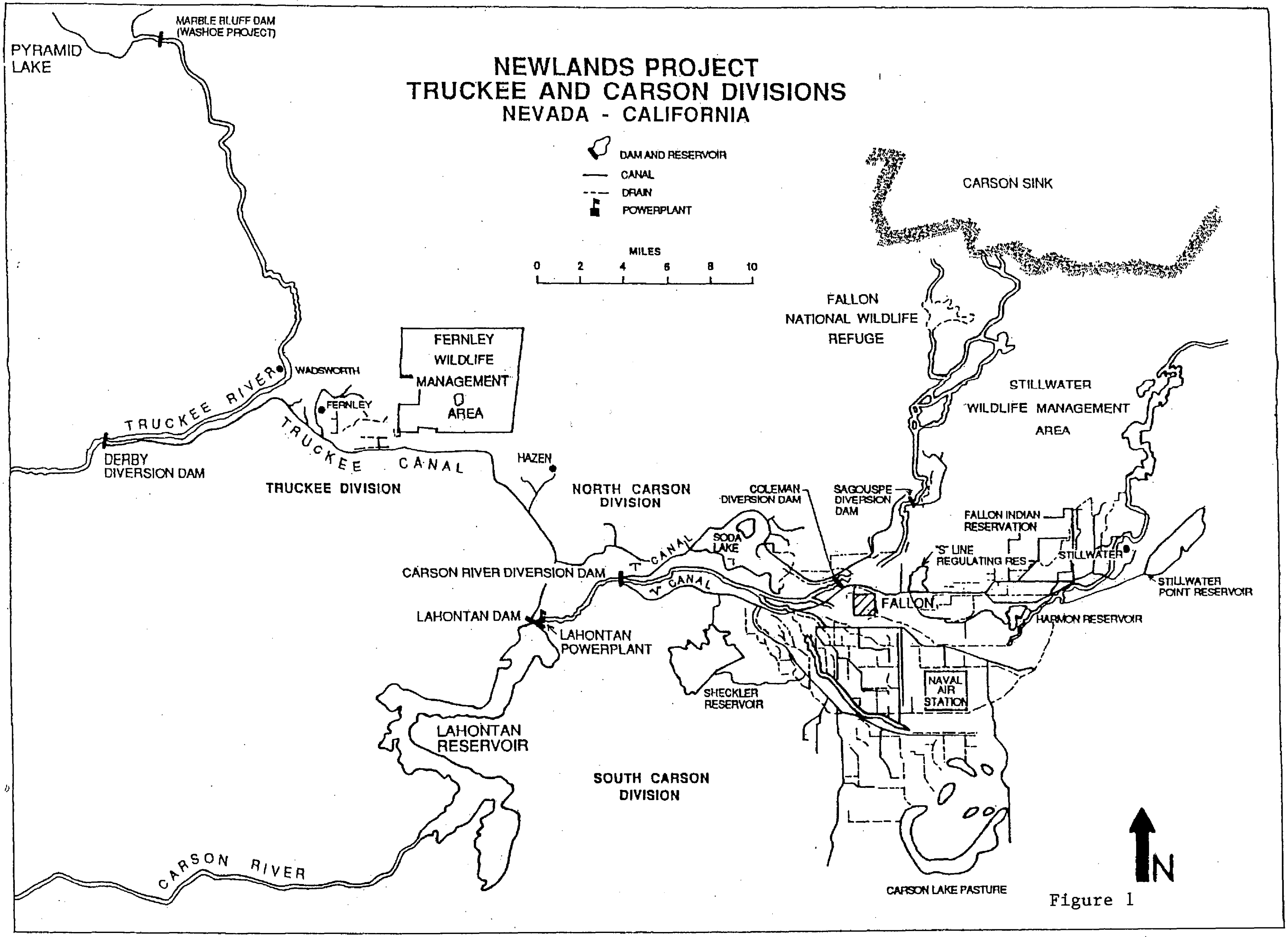
J. Figures of the Newlands Project

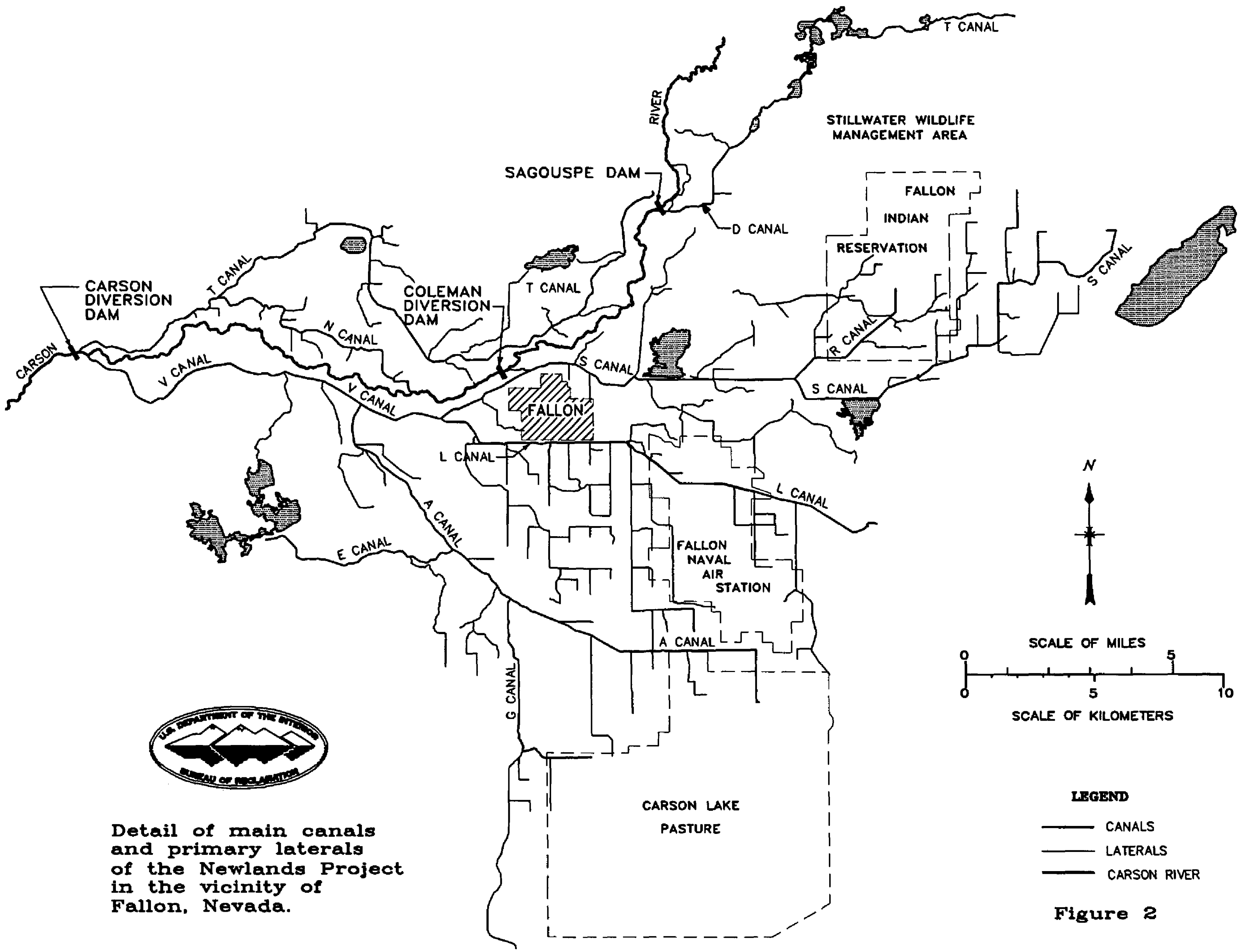
Figure **Description**

1 .... Newlands Project, Truckee and Carson Divisions.

2 .... Detail of principal canals, Fallon, Nevada.

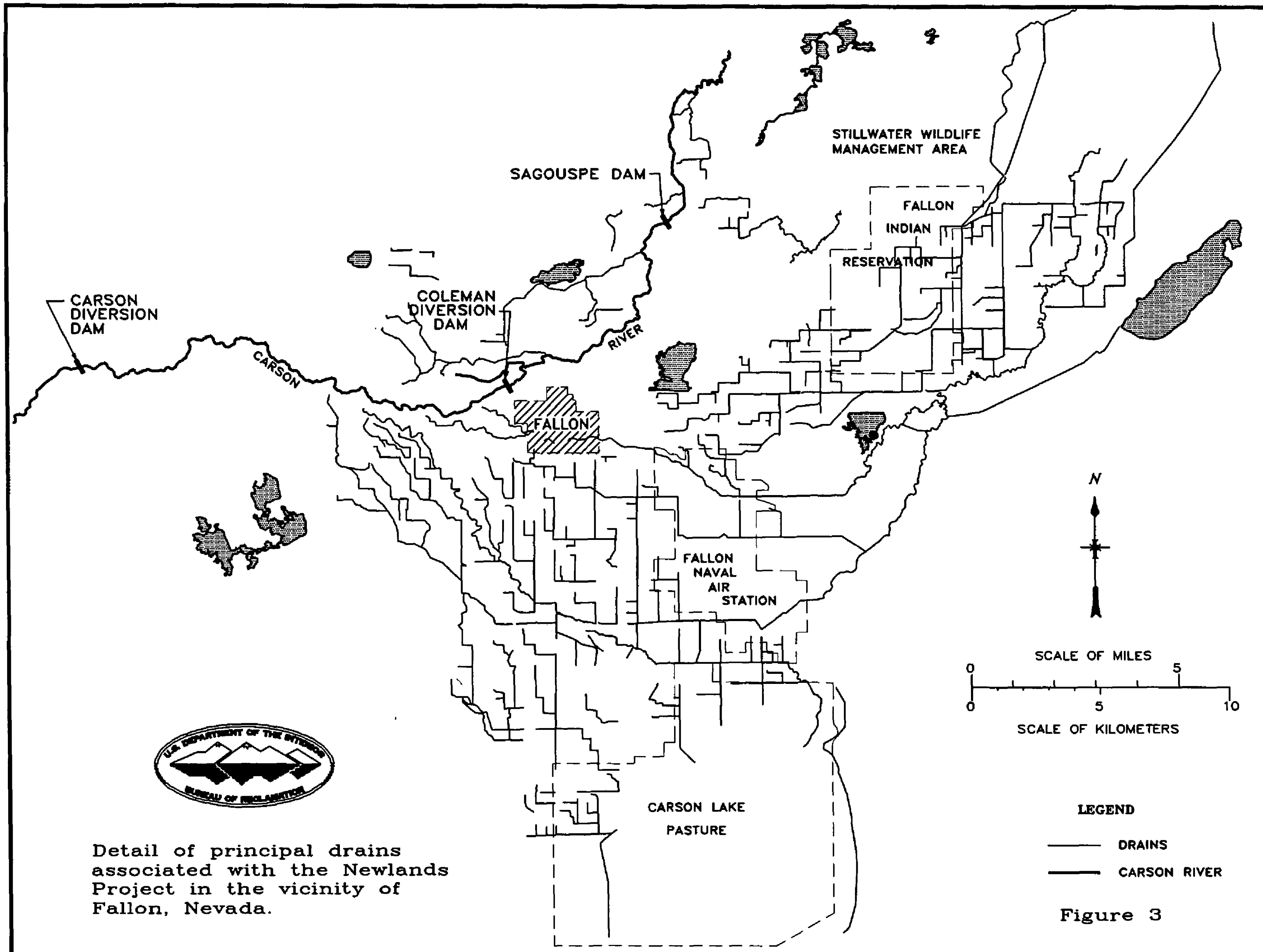
3 .... Detail of principal drains, Fallon, Nevada.


NEWLANDS PROJECT
TRUCKEE AND CARSON DIVISIONS
NEVADA - CALIFORNIA
DAM AND RESERVOIR
CANAL
DRAIN
POWERPLANT
MILES
0 2 4 6 8 10
PYRAMID LAKE
MARBLE BLUFF DAM (WASHOE PROJECT)
TRUCKEE RIVER
WADSWORTH
FERNLEY
FERNLEY WILDLIFE MANAGEMENT AREA
DERBY DIVERSION DAM
TRUCKEE CANAL
TRUCKEE DIVISION
HAZEN
NORTH CARSON DIVISION
CARSON SINK
FALLON NATIONAL WILDLIFE REFUGE
STILLWATER WILDLIFE MANAGEMENT AREA
COLEMAN DIVERSION DAM
SAGOUSPE DIVERSION DAM
SODA LAKE
CANAL
FALLON INDIAN RESERVATION
"S" LINE REGULATING RES
STILLWATER
STILLWATER POINT RESERVOIR
CARSON RIVER DIVERSION DAM
FALLON
HARMON RESERVOIR
LAHONTAN DAM
LAHONTAN POWERPLANT
SHECKLER RESERVOIR
NAVAL AIR STATION
LAHONTAN RESERVOIR
SOUTH CARSON DIVISION
CARSON RIVER
CARSON LAKE PASTURE
N
Figure 1



Detail of main canals and primary laterals of the Newlands Project in the vicinity of Fallon, Nevada.

Figure 2



Detail of principal drains associated with the Newlands Project in the vicinity of Fallon, Nevada.

Figure 3