MC100001405

Salt River Project Diversion and Conveyance System Historic District
Name of Property

Maricopa, AZ
County and State

RECEIVED
JUN 23 2017
Natl. Reg. of Historic Places
National Park Service

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name: Salt River Project Diversion and Conveyance System Historic District

Other names/site number: Granite Reef Diversion Dam, Arizona Canal, ~~New Crosscut~~ Canal, Crosscut Hydro Plant (sometimes called Crosscut Powerplant), Grand Canal, South Canal, Consolidated Canal, Eastern Canal, Tempe Canal, Western Canal, Highline Canal (sometimes called Highline Laterals, North and South Branch)

2. Location

Street & number: Greater Phoenix metropolitan region ☐ not for publication

Cities or towns: Greater Phoenix metropolitan area, including the cities of Phoenix, Mesa, Gilbert, Chandler, Scottsdale, Tempe, Glendale, Peoria, and any section of rural Maricopa County served by this system

☒ vicinity

State Arizona code AZ county Maricopa code 013 zip code

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this X nomination __ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property X meets __ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

__ national X statewide __ local

George A Hartsoe — 11/22/2016
Signature of certifying official — Date

Federal Preservation Officer, Bureau of Reclamation, DOI
Title — State or Federal agency and bureau

In my opinion, the property X meets __ does not meet the National Register criteria.

Kathryn Leonard — 17 Feb 2017
Signature of commenting official — Date

SHPO — Arizona State Parks
Title — State or Federal agency and bureau

United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is used for documenting property groups relating to one or several historic contexts. See instructions in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 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

X New Submission _____ Amended Submission

A. Name of Multiple Property Listing

The Salt River Project, Arizona, a Federal Reclamation Project

B. Associated Historic Contexts

Agricultural Settlement and the Transformation of the Salt River Valley, Arizona
Origins and Development of Irrigated Agriculture in the Salt River Valley, Arizona:
The Ancients (ca. A.D.1-1450 A.D.)
The Pioneers (1870-1902)
The Federal Reclamation Program (1903 to 1972)
The Salt River Project Hydroelectrity and the Transformation of the Phoenix Metropolitan Area (1913 to 1972)

C. Form Prepared by

name/title Lynne MacDonald, Cultural Resources Manager, and Jim Bailey. Ph.D., Historian
organization Bureau of Reclamation date November 14, 2016
street & number PO Box 25007, Mail Code 84-53000 telephone 303-445-3206
city or town Denver state CO zip code 80225-0007
e-mail lmacdonald@usbr.gov

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 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.
(_____ See continuation sheet for additional comments.)

George A Herbst 11/22/2016

George Herbst, Federal Preservation Officer | Date

Bureau of Reclamation

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.

Signature of the Keeper

8/7/2017
Date of Action

NPS Form 10-900-b (Rev. 01/2009) OMB No. 1024-0018

Name of Multiple Property Listing: **Salt River Project**

State: **Arizona**

Table of Contents for Written Narrative

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

HISTORIC CONTEXT STATEMENT, SALT RIVER PROJECT, ARIZONA

Introduction and Description

The Bureau of Reclamation's Salt River Project (Project) is located in the Salt River Valley, and provides water and hydroelectricity to the Phoenix metropolitan area in Maricopa County, Arizona.[1] Large in scope, the Project's service area covers nearly a quarter-million acres of mostly mixed urbanized and agricultural lands (see Section J, Map 1). Project water comes from the Salt and the Verde rivers, which drain about 13,000 square miles of watershed. After originating in the White Mountains in eastern Arizona, the Salt River meanders down to Tonto Basin to be joined by Tonto Creek. About 40 miles downstream, it is joined by its largest tributary, the Verde River, which originates on the 7,000-foot-high Mogollon Rim to the north. The combined average annual flow from both rivers into the Salt River Valley averages about 1.2 million acre-feet of water.

The Project has six storage dams (see Section J, Table J2). Two were constructed by Reclamation, the ***Theodore Roosevelt Dam*** located about 76 miles northeast of Phoenix on the Salt River, and ***Bartlett Dam*** 48 miles northeast of Phoenix on the Verde River. Completed in 1911, Roosevelt Dam was the first Project storage and hydropower facility. The dam, once listed on the National Register of Historic Places (National Register), was withdrawn from listing after it was extensively modified in the 1990s, but associated features remain listed on the National Register as contributing properties to the Theodore Roosevelt Dam National Register District. After World War I, between 1924 and 1930, the Salt River Valley Water Users' Association (hereafter the Association) constructed three storage dams on the Salt River downstream of Roosevelt Dam. These are ***Horse Mesa Dam***, 11 miles downstream of Roosevelt Dam, ***Mormon Flat Dam***, 14 miles downstream of Horse Mesa Dam, and ***Stewart Mountain Dam***, 10 miles downstream of Mormon Flat Dam. Reclamation completed Bartlett Dam in 1939. The last storage dam built on the Project was ***Horseshoe Dam***, constructed during World War II by the Phelps-Dodge copper company and the Defense Plant Corporation under contract to the Association. Horseshoe Dam is located 58 miles north of Phoenix on the Verde River. Due in part to the Verde River's erratic stream flow, neither Bartlett nor Horseshoe dams were built with hydropower capabilities. All six Project storage dams and associated powerplant facilities are now owned by Reclamation.

The Project conveyance and delivery system consists of ***Granite Reef Diversion Dam***, built by Reclamation and completed in 1908, and a series of interconnected canals that deliver water to Project

[1] The U.S. Reclamation Service was created in 1902. In 1923 it was renamed the Bureau of Reclamation. The bureau is referred to as "Reclamation" throughout this document. The Salt River Valley Water Users' Association was established in February 1903, and operates today as part of the larger entity typically called "SRP" or sometimes the "Salt River Project." To avoid confusion, in this document the name "Salt River Project" or "Project" is used only to refer to Reclamation's irrigation project, while the acronym "SRP" is used only to refer to the business entity comprised of the Association and the Salt River Project Agricultural Improvement and Power District.

lands on both sides of the Salt River throughout the service area (see Section J, Map 2 and Table J3). A number of the Project canals were originally built by private entities, and then purchased by Reclamation to be enlarged and integrated into the Project irrigation delivery system. Granite Reef Diversion Dam is located on the Salt River 4 miles downstream of the confluence of the Verde River with the main-stem Salt River. Key to Project operations, Granite Reef Diversion Dam diverts Salt River water into the headworks of the ***Arizona Canal*** on the north side of the river, and the ***South Canal*** on the opposite bank. The Arizona Canal, constructed in 1883 by the Arizona Canal Company and enlarged by Reclamation in 1911 to 1912, extends 38.5 miles northwest into the city of Peoria. It is the longest Project canal. It also supplies water to the Project's other main north side canal, the 22.3-mile-long ***Grand Canal***, by way of an interconnecting canal named the ***Crosscut Canal*** (hereafter called the New Crosscut Canal to differentiate it from an earlier canal of that name located nearby). The Grand Canal was constructed in 1878 by the Grand Canal Company and enlarged by Reclamation in 1907 to 1913. It is the oldest remaining Pioneer Era (late 19th century) canal north of the Salt River and stretches to the New River on Phoenix's far west side. The 3.5-mile-long New Crosscut Canal was built between 1912 and 1913 by Reclamation, with the Association performing the work under a contract with Reclamation.

On the south side of the river, the South Canal carries water from its headworks at the Granite Reef Diversion Dam to supply the ***Eastern,*** the ***Consolidated***, and the ***Tempe*** **canals** (the latter two were built during the Pioneer Era). Reclamation built the South Canal to unify the south side canal system, which previously had separate headings for each Pioneer Era canal. The South Canal stretches 10.1 miles from the headworks at Granite Reef Diversion Dam to a termination point at the heading for the Consolidated Canal. Reclamation built the upper headworks and first 2 miles of the South Canal in 1908 to extend from the newly built diversion dam to the already existing Consolidated Canal; over time the upper stretch of the Consolidated Canal has come to be considered part of the South Canal. The Eastern Canal was completed in 1909 to replace the Highland Canal (privately built in 1891) that was located a quarter-mile to the west. The Eastern Canal runs almost 14.5 miles from its South Canal turnout into the cities of Mesa, Gilbert, and Chandler. Reclamation lacked funding to build the canal, and so it was built by the farmers it would serve, under Reclamation's engineering oversight, with the agency reimbursing the water users' construction costs using "script" issued by the agency. The Consolidated Canal, constructed by the Consolidated Canal Company in 1891 and enlarged by Reclamation in 1925 to 1927, today runs 18.4 miles south from its South Canal turnout through the cities of Mesa, Gilbert, and Chandler. The Tempe Canal is the oldest continuously operating canal in the Project system. Its first section, once called the Hardy Irrigation Canal, was completed in about 1871, and helped fuel the pioneer settlement of the city of Tempe. Over the next several decades, additional laterals and canal extensions were built, carrying water further south and west. Reclamation purchased the Tempe Canal system in 1923 and enlarged it in 1926 to 1927. Today it runs 9.3 miles west and south from its heading at the Consolidated Canal to its terminus at the Western Canal, and consists of two portions of the original canal. Those two portions are a south extension constructed in the early 1880s, and the section once called the Tempe Crosscut Canal that was constructed by the Consolidated Canal Company in 1892. The ***Western Canal***, constructed by the Western Canal Construction Company and Reclamation,

was completed in 1913. Like the Eastern Canal, it was built by water users, under Reclamation's oversight, to work around lack of Federal funding, and Reclamation issued water credits to the users to compensate them for the cost to construct. The canal originates at the Consolidated Canal, runs due west about 9 miles to the Tempe Water Treatment Plant, and then continues west 14.4 miles around the north side of South Mountain to Dobbins Road. The ***Highline Canal*** (consisting of the North and South Highline canals, sometimes called the North and South Highline laterals) feed off the Western Canal and travel, respectively, north and south around the base of South Mountain. Additionally, the Salt River Project system includes 924 miles of laterals and ditches that distribute water from the main canals to farm delivery points in the water service area. And finally, the Project system includes a drainage system consisting of pumps and approximately 250 miles of drains that serve to prevent waterlogging of lands, and return recovered drain water for reuse within the system.

Summary of Significance

In addition to being Arizona's first Federal reclamation project, the Salt River Project carries the distinction of being among the first five reclamation projects authorized, all on March 14, 1903, under the Reclamation Act of 1902. The other four projects authorized on that date are Nevada's Truckee-Carson Project (later renamed the Newlands Project), Montana's Milk River Project, Wyoming's Sweetwater Project (renamed the North Platte Project), and Colorado's Uncompahgre Projects (see Section J, Table J1). Each of these projects had its own unique design and operational attributes, determined by local physical conditions of geology, topography, soils, and the availability of construction materials, and further shaped by politics, public perception, water rights disputes, and availability of funding. Design and completion of each project presented unique challenges to the first generation of Reclamation engineers. In many cases they were building dams significantly higher than built before, and pioneering design and construction processes to create these high dams. They were required to devise and test new, sometimes experimental, construction processes to find solutions for problems encountered while working in remote locations under difficult conditions. Four of these original five projects, the Salt River, Newlands, North Platte, and Uncompahgre projects, have facilities that have been listed in the National Register of Historic Places, and several have facilities that have been designated as National Historic Landmarks by the National Park Service or National Engineering Landmarks by the American Society of Civil Engineers.

The Salt River Project's ultimate consequence—the value that distinguishes it from the other four original projects and ultimately defines its historic significance—is in how the water and power it provided was integral to the transformation of a series of small desert wayside communities into one of America's most expansive urbanized metropolitan areas in less than three-quarters of a century. Water and power provided by the Project after completion of Roosevelt Dam helped propel Phoenix from a population of 5,000 in 1902, to 35,000 in 1922. By 1940, the census listed 65,414 people, and by 1980, 789,704 people called Phoenix home—and this number does not account for noteworthy population increases in nearby Mesa, Chandler, Peoria, Scottsdale, and Glendale (see Section J, Tables J4 and J5). Another factor driving growth was the post-war "sunbelt" housing boom. This sunbelt boom was linked

to advances in air conditioning technology, which required electricity to operate. Availability of Project water and hydro-electric power for non-agricultural use contributed to the rise of tourism, recreation, and retirement communities as important industries in the valley. Availability of those resources also established conditions that attracted the technology industry, leading Motorola, Intel, and others to locate plant and administrative offices in the valley. All these varied industries remain as economic staples for the area to this day.

A unique aspect of the Salt River Project is how the modern canals served to recreate irrigated agriculture in the footsteps of ancient Indian residents of the valley. Valley canal development can be broken down into three eras: Ancient (ca. 1500 B.C. to A.D. 1450), Pioneer (1870 to 1902), and Federal Government (1902 to present). Archeological evidence indicates the Hohokam Indians, who lived in the valley from ca. A.D. 400 to around 1450, were sedentary farmers that built complex canal systems using wooden digging sticks and bone- or wooden-bladed hoes. It is believed that this canal system traversed nearly 500 miles of valley land, and could have served 50,000 people. No one knows for sure why the Hohokam vacated the valley—extended drought is but one theory—but the still-visible remnants of their abandoned canals inspired the 19th century pioneers who followed to build ambitious canal systems of their own.

ORIGINS OF THE FEDERAL RECLAMATION PROGRAM

Settlement of the West and Early Irrigation

Viewed regionally, the largely arid American West receives a distinctly small share of the Earth's freshwater supplies. Not surprisingly, water is the dominating factor in the region's history because it is required for occupation, agriculture, and industry. Early Western settlers quickly realized that, although there was water, it was not always available at the time or place necessary for agricultural use or human consumption. Lacking reservoirs, they watched in frustration as snow melted and water they needed in the dry days of summer was lost. Settlers responded by developing small-scale irrigation projects that took advantage of the natural flow of the rivers. They also established a new body of Western water law to allocate water rights based on the concept of prior appropriation ("first in time, first in right") rather than the riparian rights process used in the Eastern states.

"Simple" best describes the first Western water development projects. Settlers diverted water from a stream or river and used it on lands that could be reached by gravity-flow ditches. But in many areas of the West, demand soon far outstripped supply. As more people arrived and the demand upon the water supply increased, settlers wanted to store spring runoff so that water would be available when needed during the dry summer season. However, early private and state-sponsored irrigation ventures often failed because of lack of money to hire engineering experts and build expensive structures. Thus, in the late 19th century, pressure mounted for the Federal government to intervene and directly assist in the development of irrigation works in the West.

In the jargon of the day, irrigation projects were known as "reclamation" projects. The concept was that irrigation would "reclaim" barren arid lands and make them productive. Famed Western explorer John Wesley Powell helped trigger a wide-spread reclamation movement through his extensive explorations of the American West and publication of two reports in the 1870s that discussed the potential for agricultural development of arid lands there by means of irrigation. In response, Congress passed several acts, such as the Desert Land Act of1877, that allowed settlers to claim additional land if they would irrigate portions of their homesteads. Studies and investigations conducted by the U. S. Geological Survey (USGS) and U.S. Army Corps of Engineers in the 1880s and 1890s further demonstrated the potential for irrigation development to open large areas of the West for settlement. During this period, too, railroads were completed that linked once-isolated areas to the West Coast, as well as the East and Midwest. Railroad companies promoted development of towns and farms along their routes to increase use of their rail lines. Increasingly, entrepreneurial interests focused upon the West, and they viewed irrigation development as a potentially profitable enterprise.

Up until 1890, broad public support for an organized irrigation movement did not exist. Attitudes, however, were shifting. A lingering Western drought that devastated farmers served as a catalyst for a series of National Irrigation Congresses, the first of which was held in Salt Lake City in 1891. These irrigation congresses published materials that drew public attention to demands for a greater Federal government role in the reclamation of arid lands in the western United States. The congresses brought isolated groups of reclamationists together to work collectively to gain the attention of members of Congress. In response, non-partisan political alliances formed to support western improvements, including irrigation.

Western development interests also recognized that Congress had invested in Eastern and Midwestern infrastructure development in many ways, with projects to improve roads, river navigation, transportation canals, and railroads receiving significant Federal subsidies. Westerners wanted similar financial assistance for irrigation development. However, Congress responded cautiously to Western irrigation interests. In 1890 and 1891, Congress passed legislation reserving rights-of-way for reservoirs, canals, and ditches on land in the public domain; Reclamation would later rely upon these authorities when obtaining rights-of-way for its facilities. In 1894, Congress passed the Carey Act, which would allow the Secretary of the Interior (Secretary) to “segregate” to each western state up to 1 million acres of public land, on the condition that the state oversee programs leading to those lands being irrigated and occupied. Irrigation development could occur by the state itself or by private developers, settler cooperatives, or other entities under plans approved by the state. Those settling upon the land obtained title to their land under the homestead acts if they would irrigate at least 20 acres of the allowed 160 acre tract. They had 10 years to meet this requirement. Once a settler submitted proof of irrigation and of their occupancy of their homestead to the Department of the Interior (Interior), the land under their claim would be turned over to the state, who would, in turn, patent (transfer ownership of) the land to the settler. Yet the Carey Act was largely unsuccessful because the states, like private interests before them, did not have the financial resources to design, construct, and then maintain large-scale irrigation projects. Impatient Westerners became fed up with failed private and state ventures.

They wanted the Federal government to invest directly in irrigation projects for the public land it made available for settlement.

By the end of the 19th century, the basic ingredients to obtain Congressional support for direct Federal involvement were in place. These were: arid but fertile land waiting for water to be applied; Western political alliances; entrepreneurial interest in Western development; favorable public opinion; and prior precedent for Federal investment in infrastructure improvements. The reclamation movement demonstrated its strength in 1900 when pro-irrigation planks found their way into both the Democratic and Republican campaign platforms. One year later, after the assassination of President William McKinley, those supporting a Federal reclamation program gained a powerful ally in his successor, former Vice-President Theodore Roosevelt.

Although an easterner by birth, President Roosevelt supported the reclamation movement because of his personal experiences in the West and his Progressive movement conservation philosophy. In this day, "conservation" meant the sustained exploitation of natural resources through careful scientific management for the good of the many—an apt descriptor for the early irrigation movement in general. President Roosevelt also believed that reclamation equated to homemaking. This rationale was a key argument for reclamation supporters, for they believed that a federally sponsored reclamation program would make homes for Americans on small family farms, along the lines of the "Jeffersonian Ideal." Once Roosevelt ascended to the Presidency, the reclamation movement gained momentum, prompting Senators Henry Hansborough of North Dakota and Francis R. Newlands of Nevada to enter an irrigation bill before Congress. That bill passed in both houses by wide margins, and on June 17, 1902, Theodore Roosevelt signed the Reclamation Act into law. That day, in a letter to Secretary of the Interior Ethan A. Hitchcock, Roosevelt wrote "I regard the irrigation business as one of the greatest features of my administration and take a keen personal pride in having been instrumental in bringing it about."[2]

One month later, following direction defined by President Roosevelt in his June 17 letter, Secretary Hitchcock established the U.S. Reclamation Service within the USGS Division of Hydrography, and named USGS Director Charles D. Walcott as Reclamation's Director, with Frederick H. Newell as the Chief Engineer.[3] Relying on the USGS's previous studies and recommendations by state engineers and hydrographers, Reclamation immediately began assessing potential irrigation projects in 16 western states. As a result, on March 14, 1903, Secretary Hitchcock authorized construction of the first five Federal irrigation projects. One of these was the Salt River Project, where Reclamation was authorized to build a storage dam; approval to build a diversion dam and distribution system would come later.[4]

[2] A copy of this letter may be viewed via http://www.theodorerooseveltcenter.org/Research/Digital-Library/Record/ImageViewer.aspx?libID=o182571

[3] In 1907, the U.S. Reclamation Service became an independent bureau within Interior, with Frederick H. Newell named its Director. In 1923, the U.S. Reclamation Service was reorganized and renamed the Bureau of Reclamation. The name "Reclamation" is used throughout this document when speaking of the bureau throughout its history.

[4] Several Arizona businessmen were lobbyists who were instrumental in helping to garner support for the Reclamation Act. Their efforts likely influenced selection of the Salt River Project as one of the first five authorized Federal reclamation projects.

In these early years, Reclamation operated according to basic principles defined in the Reclamation Act or in laws enacted soon thereafter. These principles were that: Federal monies spent to construct project facilities would be repaid by the beneficiaries; project facilities remained Federal property even after water users repaid Federal construction costs; and (after 1906) hydroelectric power revenues could be used to repay project construction costs and then maintenance expenses. Generally, Reclamation contracted with the private sector to perform construction work. Reclamation employees administered contracts and oversaw or inspected the contractors' work to ensure it met government specifications. When there were no acceptable bids by contractors, Reclamation constructed the facilities using its own employees; this approach was called "force account."

As would be expected for any new undertaking of such a vast scope and complexity, lessons were learned in the early years as assumptions were measured against reality and new methods were devised and tested. One of the most significant lessons involved understanding of the ability for water users to repay construction costs. At the onset, Congress, overly optimistic about the ability for new settlers to make construction cost repayments, established a 10 year repayment period. This requirement, however, proved unrealistic, and Congress raised the limit to 20 years, then 40 years, then finally some projects were authorized with a vague required linked to the "ability to repay." Repayment capability was also impacted by Reclamation's sometimes severe underestimation of construction costs, creating a larger debt than anticipated.

Other issues were encountered during Reclamation's early years. Reclamation often underestimated the amount of water needed per acre to maximize yield, causing more land to be included in a project than could be provided with an adequate water supply. At the same time, farmers often overestimated the amount of water needed and used more water than was required. Both factors contributed to water shortages on some projects. At first Reclamation also often inaccurately assessed the economic viability (repayment potential) of some projects, typically by not adequately taking into account the effect of soil and climactic conditions on crop yields. Waterlogging occurred on parts of many projects, caused by soil and drainage conditions, often exacerbated by overwatering. This required that Reclamation construct drainage systems, which created additional repayment debt. And finally, many new settlers lacked practical farming experience or had never practiced irrigation agriculture, and so didn't have the knowledge to succeed. Many also lacked the money to get their farms established and savings to see them through until the farm was profitable. The financial problem was worsened by the fact that many settled on their land before Reclamation had built the irrigation facilities. Some had to wait years for water, and many ran out of money and quit their homesteads before that water arrived. In short order, many projects fell far behind in their repayment, and settlers who once viewed Reclamation as their savior started to voice discontent.

Program Changes

In response to complaints, Congress convened several "fact finder" committees to study Reclamation's activities and processes. Committee reports resulted in The Fact Finder's Act of 1924, in which Congress mandated significant adjustments to the basic program processes. These included that: project approval would come from Congress, not from the Secretary; a new reclamation project would be approved only following detailed planning studies and cost-benefit analyses to show it was viable and could repay its debts; lands being considered for inclusion within a project service area had to first be classified for their suitability for agriculture; repayment charges could vary on the same project depending on the land classification, with poorer lands assessed a lesser repayment duty; a water district must be established for each project, and repayment contracts would be executed that made repayment the responsibility of these districts and not of the individual settlers; Reclamation would no longer operate project diversion and distribution facilities, but instead would turn operation and maintenance over to the irrigation district; and, settlers could be required to prove they had farming experience and adequate start-up capital.

The next significant changes in Reclamation's business practices occurred while obtaining approval to construct Hoover Dam. Authorized in 1928 as part of the Boulder Canyon Project, precedents set during the Hoover Dam authorization fundamentally altered the bureau's mission and the way it operated. One change was in how the Boulder Canyon Project construction costs were funded. Up to this point, per the requirement of the Reclamation Act of 1902, all money to construct project facilities had to come from the Reclamation Fund, which obtained revenue from the sale of public land and from repayment of prior construction debt. However, since the Reclamation Fund was not adequate to pay the costs to construct Hoover Dam, Congress agreed to fund Hoover Dam's construction from the U.S. Treasury. To ensure the debt would be repaid to the Treasury, Reclamation was authorized to build powerplants at Hoover Dam that could generate large amounts of hydropower for sale to Southern California developers for use for purposes unrelated to a Reclamation irrigation project. This was a second significant change to Reclamation business practices. Before that date, Reclamation was prohibited from building powerplants to generate power primarily intended for sale to non-project customers. Hoover Dam was Reclamation's first "multi-purpose" project, and forever moved the agency away from a single purpose irrigation mission. By the end of the 20th century, Reclamation had become the second largest producer of hydropower in the United States. Congress's approval of the Hoover Dam powerplants was also significant beyond Reclamation, as it opened the door to Federal entry into the power development market in competition with private industry.[5]

[5] As of 2014, Reclamation holds title to 76 hydroelectric powerplants. Of the 76, Reclamation operates 53 hydroelectric powerplants, comprising over 14 million kilowatts of installed capacity. Generation from the 53 plants rank Reclamation as the second largest producer of hydroelectric power in the U.S., accounting for 15 percent of the Nation's annual hydropower output. Annually, Reclamation-operated plants generate over 40 billion kilowatt hours of electricity (enough to meet the demand of 3.5 million homes), produce nearly one billion dollars in power revenues, and offset approximately 27 million tons of carbon dioxide. Since 1909, when Reclamation's first powerplant began operation on the Minidoka Project in Idaho, power revenues have provided more than $10 billion in repayment to the U.S. Treasury.

Hoover Dam would be the highest dam built to date and impound the largest reservoir in the world. Its construction, as well as that of Grand Coulee Dam, caught the attention of the nation, in good part due to extensive press coverage designed to show Americans, caught in the depths of the Great Depression, a positive image of progress toward a better future. Construction of these great dams presented Reclamation with new design, technological, and logistical problems to solve. Their completion led Reclamation to become well known to the general public outside of the irrigation community, and built the bureau's reputation as one of the world's preeminent engineering organizations.

This public and professional recognition, and the ever-growing demand for water and electricity, provided momentum for Congress to approve Reclamation's requests to build new construction projects, large and small. In all, of the approximately 180 authorizations Reclamation received in the course of the 20th century, about 70 were authorized before World War II, and the remainder were approved during and after the war in small and major authorizations. Major authorizations included the Pick-Sloan Missouri Basin Program in 1944, the Colorado River Storage Project in 1956 (centered upon Glen Canyon Dam and Lake Powell), and the third powerplant at Grand Coulee Dam in 1966. The last major authorization came in 1968 with the Colorado River Basin Project Act, under which the Central Arizona, Dolores, Animas-La Plata, and Central Utah projects would be developed. One water resources journalist called this post-war building boom Reclamation's "go-go" years.

After the "Go-Go" Years

The "go-go" years generally ended in the 1960s, when changes in American society and larger events affected approval for Reclamation construction projects. During these years, stiff budgetary competition arose within the Federal government, largely caused by the rising costs of the Vietnam War and the need to fund social programs introduced by the Kennedy, Johnson, and Nixon administrations. Reclamation was required to demonstrate a higher project ratio of benefit to cost to obtain authorization for new projects; this sometimes caused conflict with traditional irrigation customers, who found it hard to accept that their need alone didn't establish a powerful cause for obtaining funding. There was also an increasing public awareness of the environment and the impacts of development, fueled by landmark books such as Rachel Carson's *Silent Spring*. Pivotal environmental legislation was passed in the 1960s and 1970s, affecting processes to obtain project authorization. Particularly, the National Environmental Policy Act of 1969 and the Endangered Species Act of 1973 established processes requiring Reclamation to assess impacts to the broader human and natural environment, and define and implement mitigation actions to address adverse impacts, as well as still demonstrate project feasibility and benefit to the bureau's traditional customers. Reclamation also was now required to address multifaceted environmental issues connected with operation of existing project facilities, such as to revise water releases to provide sufficient in-stream flows to protect fisheries, preserve wetlands, and protect water quality.

Since the later decades of the 20th century, growing population, combined with drought and climate change, is causing increasing water shortages. In response, Reclamation now implements an array of

programs for drought relief and to foster more effective and efficient use of water. These include participating in cooperative contingency planning for future droughts, teaching water conservation practices, implementing water banking, and partnering in water conservation actions involving lining or piping irrigation canals.

Reclamation's organizational structure has, for much of its history, consisted of a small office in Washington D.C. that houses the bureau's Commissioner (originally titled the Director) and their staff, a technical and administrative headquarters office In Denver Colorado, and regional (originally called Division) offices that implement program management. Today Reclamation is organized into five administrative regions organized around major western watersheds, with the irrigation projects administered by staff in offices within the regions. The projects are, however, operated and maintained by irrigation districts consistent with the requirements of the 1924 Fact Finder's Act. Only some project works, primarily powerplants, remain under direct Reclamation operation. The Salt River Project is managed by the Salt River Valley Water Users' Association and the Salt River Project Agricultural Improvement and Power District (now collectively known as "SRP"), in partnership with Reclamation's Phoenix Area Office, which is a unit under the Lower Colorado Regional Office located in Boulder City, Nevada.[6]

Reclamation's projects and facilities provide agricultural, municipal, and industrial water to about one-third of the population of the western United States. Farmers on Reclamation projects produce about 13 percent of the value of all crops grown in the United States, including about 65 percent of the vegetable and 24 percent of the fruit and nut crops. As detailed later in this context statement, the water supplied by the Salt River Project makes it a significant contributor of produce supporting these statistics, and Project water and power were principal factors supporting the meteoric rise of Phoenix to become America's sixth largest metropolitan area before the advent of the 21st century.

[6] In February 1903, the Salt River Valley Water Users' Association was formed to facilitate the repayment of the construction costs to the Federal government. Establishment of a water users' association that represented the landowners receiving irrigation water was a prerequisite to approval of the Project. In 1917, Reclamation turned over operation of Project facilities (at that time consisting of Roosevelt Dam and the Project diversion-conveyance system) to the Association, but the Federal government retained ownership of those facilities. In the 1920s, the Association built three dams with powerplants on the Salt River below Roosevelt Dam to recapture and reregulate flows released from Roosevelt Dam for the purposes of hydropower generation. Their construction was subject to Reclamation's approval, and Reclamation was considered to own the dams. In the mid-1930s, Association officials petitioned the State of Arizona to create the Salt River Project Agricultural Improvement and Power District (Power District), a public entity that refinanced the Association's debt with municipal bonds. Today, all six Project dams and their associated powerplants are owned by the Federal government, but the Association operates the water system on behalf of Reclamation and the Association's shareholders, and the Power District operates with the powerplants. Furthermore, the Association, a utility cooperative, and the Power District, a municipal corporation, together make up the entity known today as "SRP," which in addition to operating the Federal Salt River Project facilities, also owns and operates additional water and power facilities throughout Arizona. The combination of public and private interests is the characteristic that makes the SRP unique in Arizona and among utilities.

PROJECT BEGINNINGS I: THE ANCIENTS [7]

Given the hot, semiarid nature of the Salt River Valley, it is not surprising that the area's first documented agricultural residents, the Hohokam, would develop extensive irrigation systems to water their fields. As sedentary desert farmers, the Hohokam became skilled at adapting this harsh environment to suit agricultural needs. The Sonoran Desert of southern Arizona and northern Mexico is one of North America's driest and hottest regions.

Hohokam origins have been disputed, with the debate centering on whether they developed from indigenous local cultures or were Mesoamerican migrants. Early excavations at a site called Snaketown, located along the Gila River south of modern-day Phoenix, suggest the Hohokam migrated north from what is now Mexico as early as 300 B.C. But recent archaeological investigations have led to a reconsideration of Hohokam origins and the development of irrigation agriculture in central and southern Arizona. A number of sites excavated along the Santa Cruz River reveal irrigation canals and fields dating back to the Late Archaic Period (ca. 1500 B.C. to A.D. 1). Associated with these canals and fields are numerous pit houses and storage facilities suggesting semi-sedentary villages of early farmers and gatherers. Perhaps more importantly, some of the earliest evidence for maize in the Southwest has been confirmed from these investigations. While the precise nature of origin and arrival of the Hohokam are still being questioned, maize horticulture and irrigation know-how were well-known in southern Arizona by the time the Hohokam culture appeared ca. A.D. 400.

Archaeologists have identified four periods of Hohokam development: Pioneer, Colonial, Sedentary, and Classic. By the Colonial Period (A.D. 750 to 950), large-scale irrigation developments existed, involving a nearly 500-mile-long network of wide and well-constructed canals. Dug with wooden digging sticks and bone- or wooden-bladed hoes, some canals measured 30 feet from crown to crown, and evidence is they rarely ran dry. The Hohokam used these canals to irrigate fields of, most notably, corn, beans, squash, and cotton, and produced two crops annually by utilizing spring runoff for one and the summer monsoons for another. Irrigation canals also helped provide water for Hohokam villages, although it is known that they also obtained water from ground wells. There is evidence that, although the Hohokam were expert farmers, there were times of considerable crop stress.

As the name suggests, the Colonial Period was also a time of expansion, with the Hohokam moving into the Salt and Gila valleys, north along the Verde and Agua Fria rivers, south into southeastern Arizona and east along the Gila River to the Safford area. Expansion might have been due to successful irrigation farming techniques that produced food surpluses resulting in population increases, or it might result from devastating Salt River floods in the 8th and 9th centuries that forced valley residents to farm

[7] Hohokam scholarship is not static, and is continuously being updated. This section incorporates both older source materials and information about newer discoveries about this ancient culture often made in association with construction of Reclamation's Central Arizona Project. See Section I, Sources, for citations of the materials used for this context section.

elsewhere. Canal technology improved during this period, with the canals designed to be much narrower and deeper to reduce water loss from evaporation, while carrying more water.

The Sedentary Period reflected relatively stable Hohokam boundaries, but with increased contact from other indigenous people. The transition between the Sedentary and Classic periods (ca. A.D. 1075 to 1200) witnessed a movement by the Hohokam away from sites they had occupied for centuries. During the Classic Period (ca. A.D. 1200 to 1450), the Hohokam area of occupation contracted, although occupation of the core lands around the Salt and Gila valleys remained stable. Changes occurred in Hohokam society due to increased contact with peoples from northern and eastern Arizona. These influences resulted in changes in architecture – the "Great House" at Casa Grande Ruins National Monument in Coolidge, Arizona, is an example of 14th century influences. Hohokam canals also reached their greatest extent during this period. With the extension of these canals, villages were no longer restricted to areas immediately adjacent to river systems. Yet within a hundred years of this height of technological capability, the Hohokam culture declined. Their villages and populations seem to have disappeared by A.D. 1450. Drought undoubtedly played a major role in the abandonment of the Salt and Gila river valleys. Hundreds of years of irrigation may have also left formerly productive farm land too saline for agriculture, and severe floods destroyed canal infrastructure. It is likely that crop yields were no longer sufficient for the large populations, and conflict over increasingly scarce food resources may have contributed to the disappearance of the Hohokam.

Seventy-five years after the departure of the Hohokam, the Spanish *Entrada* found Pima and Maricopa Indians living on lands previously occupied by the Hohokam and practicing similar canal irrigation farming techniques. Some archeologists believe the Hohokam did not disappear and that the Pima are their direct descendants. The term "Hohokam" is, in fact, a Pima word meaning (generally) "the dead" or "those who have vanished."

PROJECT BEGINNINGS II: THE PIONEERS[8]

Four centuries after the Hohokam's disappearance, the United States was embroiled in its Civil War. In 1863, in the midst of the war, Congress established the Arizona Territory, partially from lands separated from the New Mexico Territory, partially from lands secured through the Treaty of Guadalupe Hidalgo of 1848 and the Gadsden Purchase of 1853. A provisional capital for the new territory was established at Fort Whipple, in the Little Chino Valley near present-day Prescott. One year later, a detachment of officers and soldiers, accompanying the first territorial governor John Noble Goodwin, departed the fort to explore lands adjoining the Salt and Verde rivers. When they arrived at the eastern end of the Salt River Valley, they were excited by what lay before them – a wide, long, largely level fertile plain. Soon they noted that the valley contained the overgrown and deteriorating remnants of ancient canals.

[8] "Pioneer" generally refers to the era of early valley settlement by Anglo and Mexican nationals from roughly 1870 to the advent of federally-sponsored reclamation efforts in 1903.

This area was considered a "no man's land" by Spanish and American explorers. Mexican nationals had attempted to settle in the valley, but centuries-old hostilities between the Pima Indians, who farmed lands south of the Gila River, and the Apaches, who roamed lands to the north, prevented large-scale settlement of valley lands. Once the Civil War ended in 1865, the U.S. Government began to take steps to enable settlement of the western territories. Toward this end, they wished to conduct surveys of river valleys that with the greatest settlement potential. But before surveys and other aids to settlement could occur in the Salt and Verde river valleys, the military had to first address the challenges to settlement posed by the Apache and the Yavapai Indians. They did so by creating a series of military outposts along the Verde River, the most famous being Camp (later Fort) McDowell on the lower Verde River, and Camp Lincoln (later Camp Verde) on the upper Verde River.

Despite on-going threat from Apache raiders, in 1867 surveyors started to map the Salt River Valley. Starting at the intersection of the Arizona baseline (now Baseline Road in Phoenix) and the primary meridian (now 115th Avenue), surveyors logged their way east along the baseline for 33 miles and then mapped their way north along the meridian for 24 miles. The surveyors noted the soil's fertility, the land's general levelness, the lack of heavy vegetation, and the availability of water—all factors important to future settlement. Once the Arizona Territory fell under jurisdiction of the Surveying District of California, surveyors proceeded to complete and subdivide the township surveys. Deputy Surveyor William Ingalls took note of Hohokam ruins and artifacts he and his crews discovered during the process, often noting remnants of canal systems and village ruins on their survey maps. Ingalls, like his predecessors, recognized the potential for large-scale, irrigation-based agriculture.

Perhaps the first irrigation in the Salt and Verde river valleys after departure of the Hohokam occurred at Camp McDowell. Because it was prohibitively expensive to import supplies for humans and livestock to this remote location, a farm was established at the military post, irrigated via a 4-mile-long canal extending from the Verde River to the camp. Here, soldiers raised hay, sorghum, and barley for their horses and vegetables for themselves.

Non-military irrigation in the valley arrived with John W. "Jack" Swilling, one of the first Anglo settlers to call the Salt River Valley home. Born in South Carolina, Swilling, a Mexican War veteran, headed west in the late 1850s working as an ox-train teamster. He came to Arizona looking for entrepreneurial opportunities, and to fight Indians. He joined the Arizona Guard just before the Civil War. When southern Arizona and New Mexico fell under the Confederate flag, Swilling's outfit was mustered into the Confederate Army. Once the war ended and he was mustered out of the army, the Wickenburg-based Swilling traveled to the Salt River Valley. Legend is that he became enamored with the ruins of the Hohokam canal system, but romanticism aside, it is clear that he recognized that the valley's rich soils offered the possibility of reintroducing large-scale agricultural settlement. After securing financial backing, he formed the Swilling Irrigation and Canal Company. In December 1867, armed with capital, and with the services of 16 miners to assist with ditch digging, Swilling moved from his Wickenburg home to the Salt River Valley. He first settled on the north side of the Salt River near present-day Tempe, but in 1868 he relocated downstream to an area near what is now 40th Street. Here, Swilling and

his cohort constructed an irrigation ditch and began raising wheat, barley, and corn. Over the next year, under protection from hostile Apache provided by Pima and Maricopa Indians and Camp McDowell soldiers, nearly 100 people settled in the area around what is now 32nd Street and Van Buren. As more ditches were built, more settlers arrived to tap into the valley's farming potential. By 1870, the settlement included over 200 people working 3,000 irrigated acres in and around Swilling's settlement, which had been named Phoenix, in recognition that they were attempting to fashion new lives from ancient ruins.

That same year, settlers voiced their support to the Territorial Legislature for establishment of a permanent townsite in the valley for trade and commerce purposes. Swilling had anticipated the legislature would designate his existing settlement as the townsite, but instead they selected a different location west of Swilling's settlement, at an area bounded by present-day Van Buren, Harrison, 7th Street, and 7th Avenue. The selected site was on higher land, better protected from flooding, than Swilling's location, and it lacked heavy vegetation and other obstacles that would impede settlement. This new town was also named Phoenix. Only one year later, in 1871, boosters succeeded in making the new town the county seat of the newly formed Maricopa County. The placement of the new settlement at a location removed from his own town's site so disappointed Swilling that, in 1873, he left the valley and went north into the Black Canyon area to mine gold. Indirectly involved in a stagecoach robbery conspiracy, and in declining health, in 1878 Swilling died, broke, in the Yuma Territorial Prison.

While the new town of Phoenix grew on the north side of the river, other efforts were ongoing to settle the land south of the Salt River. One of the earliest efforts there was that of the Tempe Irrigating Canal Company, formed under a partnership between Swilling, B.W. Hardy, and four others. They began work in 1871 on a small canal, which diverted enough water to irrigate roughly 300 acres. The first settlers on the south side were families of Mexican descent who relocated from southern Arizona and settled and farmed east and west of Tempe Butte. In 1872 they established the town of San Pablo, and built the San Francisco Ditch and helped build the Kirkland-McKinney Ditch. The first notable individual to settle in the south was Tucson merchant Charles Trumbull Hayden. In 1871 Hayden constructed a store and ferry service across the Salt River near Tempe Butte and, in 1874, built a flour mill just upstream of the heading for the San Francisco Ditch. This grew to become the community of Hayden's Landing, an important local commercial center. The communities of Hayden's Landing and San Pablo continued to grow and by 1879 joined to become the town of Tempe. In 1878, Utah and Idaho Mormons established Mesa City (today's Mesa) 8 miles upriver from Tempe. Experienced irrigators, the Mormon settlers soon completed canals and ditches that were delivering water to their fields. Meantime, on the north side, one of the largest Pioneer-era canals was under construction, the Grand Canal, built in 1878 by the Grand Canal Company. Soon, canals and ditches crossed large areas of the valley. A number of these canals, including the Grand Canal, may have followed the routes or extended from abandoned Hohokam ditches.

In an era of relatively limited media influence, it is amazing how quickly word spread of the Salt River Valley's agricultural potential. In fields fed by miles of ditches and canals, farmers experimented with a

wide variety of crops, including cotton, grains, and citrus. From 1870 through the mid-1880s, the valley gained a reputation as the most fertile and productive land within the Territory, and boosters advertised the Salt River Valley as having as much potential for agricultural development as offered anywhere in California. These boosters had a grand vision, to build canals extending further from the Salt River to serve areas that had never yet been cultivated.

In 1885, the Arizona Canal Company, land developer Clark Churchill's enterprise, completed the Arizona Diversion Dam and Canal and started to deliver water to lands north of those served by the Grand Canal. Its heading at the Arizona Dam was some 30 miles northeast of Phoenix on the Salt River, and from there the canal traveled 40 miles west and north to its terminus at New River. It was an ambitious undertaking that required a significant amount of outside investment capital to construct. It dwarfed all previous canal-building efforts in size and scope. Fifty-eight feet across the top, 36 feet across the bottom, and 5 feet deep, promoters expected it would carry water sufficient to irrigate 80,000 acres of land, over an area that encompassed present day Scottsdale, North Phoenix, Glendale, and Peoria. Some believed that linking the Arizona and Grand canals could allow service to an even larger area. As a result, in 1889 the Crosscut Canal was completed to deliver water from the Arizona Canal south to the Grand Canal. The diversion and headworks for the Grand Canal were abandoned, since the canal was now served from the Arizona Canal. The Crosscut Canal was built along the 48th Street right-of-way south of Camelback Mountain.[9] Now, the two principal north side canals were linked into one larger conveyance system.

In 1887, two years after the Arizona Canal was completed, its investors formed the Arizona Improvement Company (AIC) to oversee an expanded land and water development enterprise. The company acquired lands adjacent to the Arizona Canal and began to develop the lands to attract new settlers. They constructed Grand Avenue, a 100-foot-wide thoroughfare that started at 7th Avenue and Van Buren in Phoenix's northwest corner and extended 18 miles due northwest. Then, along the Grand Avenue route, the AIC surveyed and platted the town sites of Alhambra, Peoria, and Glendale. The company then conducted an aggressive promotional campaign, focusing on drawing those living in southern California, which itself had a burgeoning fruit growing industry. The AIC boasted of the expanded capability for canals to provide Salt River Valley lands with water for irrigation, and the climate that would allow crops to be grown in the winter, when growers in most other climates were shut down by winter weather.

It is important to note that local canal improvement was not the sole ingredient to enable Phoenix area settlement and the growth of its agricultural industry. Improvements to regional and national transportation facilities were also required to link the valley to wider markets for their produce. The Phoenix area was still relatively isolated from the outside world. The Southern Pacific Railroad's new transcontinental route did not pass through Phoenix; its closest depot was located 30 miles south at the Maricopa settlement. Local developers had built a stage and freight road from Maricopa to Phoenix, but

[9] The Crosscut Canal built in 1889 was later replaced with a new canal, also called the Crosscut, and therefore they are today known as the Old Crosscut and the New Crosscut canals, and will be referred to as such in this document.

this was inadequate to support significant commercial development of the Phoenix area. Securing a direct rail line connection was essential to growth, so in 1886 a group of local promoters secured sufficient capital from Chicago and San Francisco investors to organize the Maricopa and Phoenix Railroad Company. With support from the Southern Pacific Railroad, construction commenced to build a branch line to connect Phoenix to the Southern Pacific at Maricopa. On June 19, 1887, the branch line reached Tempe, and three weeks later, on July 4, the first train arrived in Phoenix amid much fanfare.

With the completion of the branch line, new settlers arrived daily, and agricultural goods were shipped from the valley out to markets both regional and distant. In the early 1890s, another branch line, the Santa Fe, Prescott, and Phoenix Railway, was built to connect Phoenix to the Atchison, Topeka, and Santa Fe Railway line across northern Arizona that operated between Chicago and California. The population grew in response to canal improvements and the new connections to the outside world. U.S. Census records show that, in 1880, 1,708 people called Phoenix home. As the infrastructure improved, by the early 1890s that population had almost doubled to 3,152. By the 1900s, Phoenix had become the new Territorial capital with nearly 5,500 residents (see Section J, Table J4).

Yet all was not rosy in the valley, particularly during the 1890s. Agriculturalists realized that, while the Salt River contributed to the area's agricultural and economic growth, its flow was erratic at best. Often there seemed to be either too little or too much water. Alternate drought and flood cycles in the early 1890s, followed by an extended drought in the late 1890s, forced thousands of acres out of cultivation, contributed to an all-around economic malaise, and drove many settlers to leave seeking areas with a more dependable water supply. However, this issue did not stop Dr. Alexander J. Chandler from pursuing ambitious plans for water resources development. Chandler wished to bring Salt River water further south to serve his lands near Mesa, to have an efficiently operated canal system, and to build a hydroelectric plant that could provide community electrical service and pump irrigation water.

Canadian by birth and a veterinarian by trade, Chandler arrived in the valley in 1887 to serve as the Territorial veterinary surgeon. Initially uninterested in the agricultural potential of the valley, his observation of the lush green landscape produced by a rare autumn downpour awakened him to how water changed the arid land. In 1892—with financial backing provided by eastern capitalists—Chandler purchased two 160-acre tracts of land under the Tempe and Mesa Canals for agricultural development. Frustrated by the inability of the Mesa Canal Company to reliably deliver an adequate supply of water to his land, and believing that a significant conservation of water could be realized by consolidating multiple canal headings to a single diversion point, he determined he would build a canal to his property served by a sturdy stone diversion structure less prone to destruction by spring floods. He envisioned using a section of the existing Mesa Canal for a portion of his new canal. He negotiated with the Mesa Canal Company to assume control of that section of canal in exchange for assurances that delivery of their water would have priority, and that he would pay them an annual rent for use of their rights-of-way. He then purchased a dry-land steam dredger, and in 1891 began excavations to widen that stretch of the Mesa Canal and build an extension running 19 miles further south. His company also constructed a stone and earthfill diversion dam on the south side of the Salt River, not far from the site where

Reclamation would later build the Granite Reef Diversion Dam, and from that constructed a canal extension to connect the Mesa Canal with the new diversion. In 1892 Chandler established the Consolidated Canal Company as a corporation, and thereafter this canal, including the section of the Mesa Canal it incorporated, became known as the Consolidated Canal. While enacting this work, Chandler also began discussions with the Tempe Canal Company about diverting their water at his dam and then delivering it to a point on the existing Tempe Canal by way of a crosscut canal he would build, extending from the Mesa/Consolidated canal to the Tempe Canal. Chandler intended to run the Tempe water through a newly-constructed hydropower generation plant at a natural 35-foot drop, and then market that power to the south-side towns. The Tempe Canal Company refused to agree to Chandler's proposal. However this enterprising gentleman proceeded anyway. He constructed the Tempe Crosscut Canal and the powerplant at what came to be known as Chandler Falls, and filed for the rights to non-consumptively use the Tempe water right. The Tempe Canal Company took Chandler to court, but the court ruled in Chandler's favor, finding that Chandler's use did not diminish the Tempe Canal Company's right or their ability to use their water right. Chandler's powerplant generated the first electricity delivered to Mesa.

Unfortunately, Chandler's efforts coincided with the worst drought the valley had witnessed during the settlement period. Throughout the valley, cultivated lands dried up, and hundreds of discouraged residents moved away. Chandler's new irrigation and power facilities would be useless if there was little or no river water to divert into the heading, leading Chandler to become one of a group of outspoken advocates for the construction of dams that could not only retain sufficient water to carry the valley through drought, but would lessen the chances of devastating floods during wet periods. He and others attempted to raise capital to build storage dams on the Gila and Salt Rivers, including at a promising location identified in the Tonto Basin where, a few decades later, Reclamation would build Roosevelt Dam. However, the country was also in the midst of one of the worst financial depressions of the 19th century. When efforts to privately fund reservoir construction failed, Chandler and others became active in the national lobbying campaign that culminated in the passage of the National Reclamation Act of 1902. Another of those advocates was Benjamin Fowler, who would later serve as the Salt River Valley Water Users' Association's first board president. Fowler, Chandler, and other Salt River Valley promoters would quickly move to reap the advantages of this new opportunity they had helped bring to fruition.

PROJECT BEGINNINGS III: FEDERAL GOVERNMENT

As outlined earlier in this context, by the late 19th century, private and territorial and state governmental water interests across the arid West were seeking Federal intervention to assist in the development of Western reclamation projects. The American West had witnessed repeated failures of state and privately financed water ventures, typically due to lack of funding to construct dams and complete complex irrigation canal systems. This ultimately led to the passage of the Reclamation Act of 1902. The

Secretary of the Interior was tasked with implementing the Reclamation Act and had established the U.S. Reclamation Service to design, build, and operate the irrigation works.

The Secretary had, however, stipulated two conditions that had to be met by local irrigation interests before any Federal reclamation project could be authorized under the Reclamation Act. First, local landowners and other interests that desired a Federal water project were required to resolve their differences, particularly related to water rights allocations. And second, they were required to establish a landowners' association to represent the interests of the water users within the proposed irrigation project area.

The Salt River Valley irrigation interests acted swiftly to address these requirements and thereby improve their chances to be one of the first Federal reclamation projects authorized by the Secretary. The valley leaders organized themselves as the Salt River Valley Water Users' Association, and on February 7, 1903, the Association filed incorporation papers under Arizona Territorial Law. They elected teacher and publisher Benjamin Fowler as the first Association president.

Additionally, 3,100 individual landowners within the potential irrigation area pledged approximately 200,000 acres of lands as collateral for funds Reclamation would put into the Project, funds the Association shareholders would be required to repay to Reclamation in accordance with the stipulations of the Reclamation Act. The Association would also ensure that rights to stored water would be equally available to all members, and that assessments to repay construction costs would be equally distributed across the membership. The Association would also negotiate with Reclamation to resolve problems and concerns, guarantee the repayment of construction costs to Reclamation, and enforce payment collection from local landowners. With the Association established and all requirements defined and agreed upon, on March 14, 1903, Secretary of the Interior Ethan A. Hitchcock authorized the Salt River Project, Arizona's first Federal reclamation project.

Over the next five years, Reclamation and the Association worked together on three important goals: 1) to build the Salt River storage dam Chandler, Fowler, and others had envisioned over the previous two decades; 2) complete Reclamation's purchase of, and then improve and expand the private canals into an integrated system; and 3) construct a single dependable diversion dam downstream from the storage dam to replace the multiple tenuous rock and brush diversion structures that so often washed away in floods. In charge of the efforts were Reclamation's Project Supervising Engineer Louis C. Hill, Reclamation's Chief Engineer Arthur Powell Davis, and design engineer Fred Teichman, with Reclamation Director Frederick H. Newell overseeing progress. Demonstrating progress was paramount, because they intended the new dam to stand as a symbol of the success of the Federal irrigation project, and serve as a showpiece to demonstrate Reclamation's engineering and construction expertise. The dam's massive thick-arch design was intended to portray an image of permanence and stability. The dam was to be named Roosevelt Dam, in honor of the former President who had made the Federal reclamation program possible.

Reclamation initially intended Roosevelt Dam's primary purpose to be water storage and control, but in 1904 hydropower generation capability was added to the plan. Hydropower generation was added to supply electricity to power equipment needed to quarry stone and operate construction equipment. It would also be used in the constructions camps to light and heat buildings, reducing the high cost to purchase fuel oil and haul it to the construction site. Ultimately, in addition to reducing construction costs, hydropower generation provided electricity that would be marketed to Phoenix, creating revenue that would be applied toward repayment of construction costs.

Building Roosevelt Dam, however, proved more difficult and time consuming than anticipated, in part because the site was so remote—nearly 60 miles from the railhead at Mesa and 40 miles from the supply point at the copper mining town of Globe. Although the initial processes to prepare the dam site for construction commenced on August 24, 1903, a supply haul road first had to be constructed to the location before actual dam construction could begin. Reclamation built the haul road along an old Indian pathway known today as the Apache Trail. Road construction presented challenges due to steep gradients (Fish Creek hill being a notable example) and narrow access in the canyon. These complications increased the time and effort required, and therefore required more money than estimated. Road construction came to a halt when funds ran out. Through sales of bonds issued after obtaining approval from Congress, and with borrowed money, valley towns were able to provide the money to complete the road, with Phoenix contributing the most at $67,500. By summer 1904, road construction had resumed, with Apache Indians from the San Carlos Indian Reservation providing the bulk of the labor for the final reach of the road. When finished in December 1904, the 64-mile-long road had cost over $200,000 to complete. By the time Roosevelt Dam was finished in 1911, nearly $550,000 had been spent building 112 miles of roads to the dam site at a cost of roughly $5,000 per mile.

With the completion of the haul road in sight, in 1904 Reclamation began construction of a 20-mile-long canal (the power canal) that would provide water for limited hydropower generation for use for dam construction purposes. Then, on April 8, 1905, the John O'Rourke Company out of Galveston, Texas, was awarded the contract to build the dam for the winning bid of $1.1 million. They were given a scant 2 years to complete construction. O'Rourke's workers first worked to move equipment and supplies to the site, install a construction plant that included concrete mixing facilities and an overhead cable system across the canyon. They set to work to construct the coffer dam and flume needed to divert river water around the construction site, and to begin to quarry stone. O'Rourke hired Italian-born stonecutters ("rockmen"), brought from Pittsburgh, to cut and finish the limestone blocks that would form the dam's distinctive facade. They also built two construction camps to house workmen—O'Rourke's Camp and Roosevelt Camp, and Reclamation built their camp, "Government Hill," for its employees overseeing dam construction. In all camps, races and ethnicities were segregated from each other, a normal practice for the times. In 1906, Reclamation installed a temporary 900 kilowatt (kW) electric generator to supply electricity for construction, and one year later, workers installed a permanent 900 kW generator.

As work progressed on Roosevelt Dam, in late 1906 Reclamation also laid the cornerstone for the second component of the Project's overall operational plan—a dependable, permanent diversion dam.

Diversion dams in the valley had, up to this time, been crude rock, brush, and timber structures, easily washed away in floods. When one flimsy diversion structure was washed away, another would be built, with the cycle repeating itself. Reclamation selected a site for a diversion dam about 50 miles downstream of Roosevelt Dam, below the confluence of the Verde River with the Salt. There they built the Granite Reef Diversion Dam, a concrete structure that would end the inefficient build-flood-repair cycle experienced up to that date. Completed in 1908, Granite Reef Diversion Dam was a 29-foot-high rubble and concrete weir structure with a 1,128-foot-long crest. It diverted water into two canal headworks, one on the north and one on the south side of the river, feeding canal systems that were being modified to work as consolidated systems.

While Granite Reef's construction was completed smoothly and on time, all was not going so well on completing Roosevelt Dam. Flooding had washed out large sections of completed work, and the contractor's general inexperience made them unable to easily deal with difficulties to be expected when building a structure as large and complex as Roosevelt Dam. The time needed to complete the job expanded from 2 to 5 years, straining the working relationship between Reclamation and the O'Rourke management. The problems and delays also significantly increased construction costs. Association landowners were not happy to see the repayment amount increase, or to endure delay of the date they would have access to an increased irrigation water supply. One positive note existed, however. Four more permanent hydropower generating units had been installed at Roosevelt Dam and by September 30, 1909, the dam's powerplant capacity was rated at 4,500 kW. On that date, electricity generated at Roosevelt Dam was first delivered to Phoenix. A law passed in 1906, the Town Sites and Power Development Act, gave Reclamation the ability to sell power generated on its projects and to apply the power sale revenue toward project repayment.

Ultimately, Roosevelt Dam was completed and on March 18, 1911, with a huge American flag draped over the dam's parapet, former President Theodore Roosevelt pressed a button that released a jet of water down the canyon from America's newest Progressive-era engineering masterpiece. A thousand onlookers witnessed this historic event – the dedication of the world's highest masonry gravity dam, which would secure a reliable water supply to fuel the economic growth of the Salt River Valley. In his address, Roosevelt expressed his pleasure that something so monumental would carry his name, and placed the dam up there with his other significant engineering achievement, the Panama Canal. When completed in 1911, Roosevelt Dam was 184 feet thick at the base, 16 feet wide at the crest, and rose 280 feet, while its reservoir, Roosevelt Lake, could hold 1.28 million acre-feet of water.[10] The dam, one of Reclamation's first constructed works, was hailed as a significant engineering achievement. It was also the first step in a process that would drastically accelerate the growth and economic prosperity of the Phoenix metropolitan area.

[10] In the 1990s, modifications were made to raise Roosevelt Dam to increase the reservoir's flood storage capacity. The elegant stone facade was encased within concrete, the dam's height increased from 280 feet to 357 feet, also resulting in an increase in crest length from 723 from to 1,210 feet. In addition, the original spillways were reconstructed, and a highway bridge was constructed upstream of the dam to take traffic off the crest.

Once the congratulatory speeches and the parades ended, reality set in, in the form of discussions between the Association and Reclamation over the Project's higher than anticipated construction costs. As previously noted, the first 20 years of Reclamation's existence was a period where administrative processes were defined and tested. This learning curve was evident in processes the agency used when estimating what it would cost to build facilities on uncontrolled rivers in remote locations; in the early years, Reclamation consistently underestimated the costs to build projects, leaving water users with sometimes significantly higher annual repayment charges. On the Salt River Project, the original estimate to construct Roosevelt Dam was approximately $3 million. However, the actual cost to build the dam and its access road was significantly higher. Additionally, the estimate had not included the cost to build Granite Reef Diversion Dam and complete the canal system in the valley during the period the dam was under construction. This drove the actual Project construction cost to well over $10 million to date.

The Association, circumventing Reclamation, complained directly to the Secretary of the Interior, lodging allegations of mismanagement of the dam construction process, excessive expenditure, and poor cost management. They wanted unwarranted expenses deducted from the repayment amount. The Secretary appointed three separate boards to investigate various aspects of the allegations. After several years of review and discussion, the review boards concluded that the Salt River Project's actual total construction cost to be nearly $13 million, and assessed the repayment amount to be charged to Association landowners at $10.27 million, which amounted to a charge of $60 per acre. Furthermore, the Secretary recommended that a contract be drawn up that would allow the landowners, through the Association, to assume control of operating the Project. On September 6, 1917, a contract was signed, and two months later the Association took full control of all Project facilities consisting of Roosevelt Dam, Granite Reef Diversion Dam, and the irrigation canals. The Association was now responsible for future operation and maintenance expenditures, as well as construction repayment costs. Additionally, the Association was approved to use receipts from sale of excess electricity generated at Roosevelt and other powerplants to pay Project debt.

While construction on Roosevelt Dam and Granite Reef was in progress, Reclamation had also been pursuing the third goal of the overall Project plan, which was the consolidation and improvement of the canal system. During the Project's first decade Reclamation acquired and improved a number of the existing canal systems, as well as worked with the Association to build new canals to expand and unify the irrigation service area. In 1906 the Arizona main canal system and its appurtenances were purchased for $235,168. Included in this purchase, for $78,993, were the Crosscut, Grand, Maricopa, and Salt River Valley canals, the joint head of the Maricopa and Salt River Valley canals, and the appurtenances thereof. On the south side, in 1908 Reclamation purchased the Main Consolidated Canal and the East Branch of the Consolidated for $187,000, although this purchase price was reduced by the cost for extensive structural repairs to the system. The Consolidated system was needed to help unify water distribution systems on the valley's southern and eastern reaches. Landowners who drew water from Tempe Canal, however, did not decide to bring their canal system under the Salt River Project until 1923; as holders of some of the earliest water rights on the Salt River, they did not feel they needed

Project water to meet their needs, and their users paid much lower annual assessments for water and operation and maintenance than would be paid if they were under the Project. Ultimately, the need to obtain help to drain lands waterlogged from 50 years of irrigation led them to turn title to their system over to Reclamation and join the Association. In exchange for the value of their improvements and water rights, and after paying all back assessment to be on equal terms with the original landowners in the Association, the landowners under the Tempe system were given $100,000 in credits toward Project assessments and inclusion of their lands in the larger drainage system being constructed for the Project.

Enhancing the existing canal system Reclamation had purchased was the final important Project development goal. The Grand Canal was enlarged between 1907 and 1913; the Arizona Canal was enlarged from 1911 to 1912; and from 1912 to 1913 the Association (under contract with Reclamation) constructed a new Crosscut Canal east of the old Crosscut Canal. The South Canal, which replaced several different canal headings with one, was built by Reclamation between 1906 and 1908 to unify the south-side system. As part of this unification effort, the Consolidated Canal was linked to the South Canal; because much of the Tempe Canal's water was delivered through the Consolidated Canal, this also caused much of Tempe's water to also be diverted at Granite Reef, even though the Tempe Canal system did not actually become part of the Salt River Project until 1923. The Eastern Canal, built by its water users under Reclamation's oversight in 1909, also with its heading out of the South Canal, replaced the old Highland Canal ¼ mile to the west and provided irrigation to more lands in east Mesa and Gilbert. The final major new canal constructed was the Western Canal, which ran west from a heading at the Consolidated Canal to South Mountain and then on around the north side of South Mountain to just west of 19th Avenue in Phoenix. The Western Canal was built between 1911 and 1915, in part by Reclamation and in part by the water users organized as the Western Canal Company. With completion of the South Canal, most all south-side valley canals were now unified into a single efficient carriage system; this goal would not be fully realized until 1923, when the Tempe Canal system came under the Project. Later, from 1925 to 1927, the Consolidated Canal was enlarged and lined.

Ironically, the increased water supply provided by Roosevelt Dam and the expanded canal system reestablished an old problem that had afflicted the Hohokam irrigators centuries earlier – the waterlogging of lands. Prior to completion of the dam in 1911 and expansion of the irrigation system, few areas in the valley had required drainage. But by 1916, significant drainage issues existed. Due to underlying bedrock or caliche hardpan, excess water applied to fields could not naturally drain away, and trapped water created a high water table that waterlogged the fields in the central and the southwest end of the Project area. In 1917 Reclamation and the Association concluded a joint study that demonstrated that drainage problems could be resolved by surface waste water management and subsurface drainage. They concluded that implementing a drainage program was essential both as a water conserving measure and to protect the soils from damage caused by over-saturation. The drainage program would pump trapped water out of fields and into Project ditches. The pumped water could then be used to supplement the irrigation water supply. Ten drainage pumping plants already existed on the Project, and between 1918 and 1924, the Association installed pumps at many new locations. Groundwater was piped from these wells to discharge directly into canals. This resolved the

waterlogging, and the water pumped out was made available for irrigation. These pumps were powered with electricity generated at low-head hydropower plants constructed on Project canals. For this and other Project purposes, low-head plants were built on the Arizona, South, Consolidated, and new Crosscut canals. The Crosscut Hydropower Plant still generates electricity from its original structure, which was completed in 1913. The Association assumed management of the drainage system in 1919, following an amendment to it Articles of Incorporation to include drainage operations.

In addition to providing a more unified and efficient canal system for the valley, this era of Federal Project development triggered a flurry of dam building and hydropower development by Reclamation, the Association, and private corporations on the Salt and Verde rivers. Although construction of Roosevelt Dam and improvement of Project distribution facilities had stimulated steady growth of the valley's agricultural industry and towns, additional water and electricity were needed to both meet current demand and to support further development. Therefore, between 1923 and 1925, the Association constructed Mormon Flat Dam on the Salt River downstream from Roosevelt Dam. Construction of Mormon Flat allowed irrigation water to be released from Roosevelt Dam to generate electricity outside of the irrigation season because it could be recaptured and reregulated at Mormon Flat. The Association could sell the additional electricity to pay the costs of operating and maintaining the system and could apply it toward Project construction cost repayment. The Association financed Mormon Flat's construction by bond sales and with funds obtained from Central Arizona Light and Power Company. Almost immediately after Mormon Flat's completion, the Association erected Horse Mesa Dam and Powerhouse halfway between the Roosevelt and Mormon Flat dams. Its three 11,000-kW hydroelectric generators made Horse Mesa the valley's largest hydroelectric producer. Built mostly to generate electricity for sale to the Inspiration Consolidated Copper Company of Miami, Arizona, the Association financed the $5.3 million dam through bond sales. Then, from 1928 to 1930, the Association, again with help from bond sales, constructed Stewart Mountain Dam and Powerhouse 10 miles downstream of Mormon Flat Dam. Its powerhouse housed a massive turbine-generator, with transformers that raised the generator's output from 11,400 to 45,000 volts for transmission to the valley. Stewart Mountain's hydroelectric output was sold to valley residents to help address increasing demands by urban households and businesses, as well as to farmers and rural residents who wanted the same electrical services enjoyed by urban dwellers.

The Project system building boom continued through the economically depressed 1930s. Using New Deal public works funds, Reclamation performed extensive spillway repair and maintenance work at Roosevelt, Horse Mesa, Mormon Flat, and Stewart Mountain dams. Until 1938, much of the work was performed by young men from the Civilian Conservation Corps, who to completed much-needed repairs and improvements to the Project canal and lateral system. In 1936, Reclamation began constructing Bartlett Dam, on the Verde River 48 miles northeast of Phoenix. Bartlett's construction would allow flows of the Verde to be stored for Project use. The Association agreed to pay 80 percent of Bartlett's $4.7 million construction costs, while the Bureau of Indian Affairs covered the balance since the Salt River Pima-Maricopa Indian Community would receive nearly 20 percent of Bartlett's stored water. Reclamation designed Bartlett Dam with an eye toward cost reduction, utilizing a multiple arch and

buttress design to reduce material requirements and associated freight costs. Completed on time in three years, the dam realized the Association's goal of having storage facilities on both the Salt and the Verde, its major tributary.

The World War II years witnessed an alliance that resulted in the construction of the final Project storage dam, Horseshoe Dam, 10 miles upstream from Bartlett Dam on the Verde River.[11] Constructed between 1944 and 1946, the dam was built for the Association by the copper giant Phelps-Dodge, with additional funding from the United States Defense Plant Corporation, and cost approximately $2.5 million. Phelps-Dodge built Horseshoe Dam for the Association under a water exchange agreement that would allow the company to make diversions on the Black River for their Morenci mines in eastern Arizona. In 1949, spillway gates were added to increase Horseshoe Reservoir's water storage capacity to supply additional water to Phoenix. In 1972, pumped-storage capability was added at Horse Mesa Dam, increasing the electricity that could be generated using Project water.[12]

When Horseshoe Dam was completed in 1949, the Salt River Project was essentially complete, but the transformation of the Phoenix metropolitan area had only begun. Project water and electricity would help spark population growth at a rate and to an extent that few American cities would experience.

WHAT THE PROJECT WROUGHT—THE TRANSFORMATION OF PHOENIX[13]

When Reclamation received authorization to construct Theodore Roosevelt Dam in 1903 as the first step to establish the Salt River Project, boosters immediately began to promote the Salt River Valley as a fine place to live. They informed farmers of the promise of a dependable water supply that would negate the impacts of the valley's notorious wet/drought cycles. In 1908 the Santa Fe Railroad distributed over 80,000 copies of a special edition of its magazine *The Earth* that touted the benefits to be offered in Phoenix. Other boosters tirelessly promoted the valley as one of America's most promising places to live, work, and play year round.

Even before completion of Roosevelt Dam, promotional efforts attracted new farmers, and cultivated acreage increased from 134,000 acres in 1905 to nearly 151,000 acres in 1909. A reliable water supply

[11] In 2004, SRP acquired C.C. Cragin Dam, formerly known as Blue Ridge Reservoir, near Long Valley on the Mogollon Rim, and Congress subsequently approved its transfer to Reclamation for integration into the Project. However, it is not considered a potential contributing property under the Salt River Project multiple property listing.

[12] Water used to produce electricity normally goes downstream after the hydroelectric generation process. A pumped-storage system recycles water used to produce hydroelectricity by pumping it back into the upper reservoir during late-evening and early-morning hours when electricity demand is low. It can then be re-released through the generators to again produce power.

[13] Sources for this context include Philip VanderMeer, *Phoenix Rising: The Making of a Desert Metropolis* (Carlsbad, CA: Heritage Media, 2002); Robert Autobee, *The Salt River Project* (Denver: Interior, Bureau of Reclamation History Program unpublished draft manuscript, 1993); Bradford Luckingham, *Phoenix: The History of a Southwest Metropolis* (Tucson: Univ. of Arizona Press, 1989); Michael Logan, *Desert Cities: The Environmental History of Phoenix and Tucson* (Pittsburgh: Univ. of Pittsburgh Press, 2006); Douglas Kupel, *Fuel For Growth: Water and Arizona's Urban Environment* (Tucson: Univ. of Arizona Press, 2003); and Gerald Nash, *The American West Transformed: The Impact of the Second World War* (Bloomington: Indiana Univ. Press, 1986).

and the valley's long growing season allowed Project farmers to grow a wide array of crops. Alfalfa hay was the dominant crop in the early years, with cotton, corn, and various grains, but valley farms also produced an array of vegetables and fruit, including lettuce, beans, cantaloupes, olives, dates, sugar beets, oranges, lemons, peaches, and watermelons, as well as nuts. The livestock, dairy, and poultry industry increased in response to greater local demand for food; chicken and ostrich farms also provided feathers for east and west coast milliners. Land value increased as a result of agricultural and urban growth. In 1902, land value was anywhere between $25 and $50 per acre, with an assessed value of $3.5 million. By 1921, land was $188 an acre, with a total assessment of $128 million. Another indicator of the growing prosperity may be that, in that same year, Maricopa County built more new concrete roads than any other county in America.

The availability of Project water and power helped lead to changes few had envisioned in 1903, changes that centered upon a growing tourism industry rather than agriculture. Visiting the valley to enjoy its arid warmth was not new. For several decades, tuberculosis patients from all over America had been traveling to southern Arizona seeking healing in the dry climate, and sanatoriums for the sick were operating in the Phoenix area. However, by the 1920s, Americans were taking to the roads in increasing numbers to vacation. Promotional efforts, such as those by the 550-member-strong Phoenix-Arizona Club that presented central Arizona as the place to escape winter's icy grip, attracted ever greater numbers of tourists as well as winter season residents to the area. In 1929 a commercial airfield, Sky Harbor, opened for business in Phoenix, and the valley now offered resort hotels for the affluent, such as the Arizona Biltmore resort, completed that same year for $2 million. In 1929, nearly $10 million was spent by tourists in the Phoenix area. By the 1930s, numerous resorts, hotels, and motor camps from Peoria to Apache Junction were catering to thousands of winter residents and tourists. In 1934, a local advertising agency created the slogan the "Valley of the Sun" to replace the prosaic "Salt River Valley" in promotional efforts. The tourism industry, coupled with the ever-increasing year-round population, was making the once-diminutive, dusty desert town into one of the Southwest's largest urban centers. Phoenix and its burgeoning satellite towns had become magnets for those seeking employment, better health, warm winters, and relaxation. By 1960, Phoenix would supplant El Paso, Texas, as the interior Southwest's largest urban center (see Section J, Table J6).

World War II triggered a profound transformation that forever altered the economic and social landscape of the American West. Massive hydroelectric dams, including Reclamation's Hoover, Shasta, and Grand Coulee dams, were constructed to fuel a billion-dollar defense industry infrastructure in California and the Pacific Northwest. It is estimated the Federal government directed $40 billion into the Western economy during this period to build military bases and depots, shipbuilding, airplane and other manufacturing plants, and training centers, and to procure goods and services from contractors. Newcomers flocked to Western cities in search of work associated with the war production industries. Most major cities in the American West during this period, Phoenix included, experienced annual growth rates exceeding 10 percent. In a way, World War II's industrial mobilization created a boom not unlike the mining and railroad booms of the nineteenth century, which brought large numbers of people west looking for work or wealth. When wartime mobilization reached its apex in late 1942, millions of

new jobs had been created; it is estimated that metropolitan counties in the Mountain and Pacific states had gained just under 1 million new residents, while Northeastern cites lost over a million residents.

The Phoenix metropolitan area greatly benefited from the wartime largesse. World War I had helped reshape the valley's economy when the Goodyear Company used valley cotton to make airplane wings and tires. World War II had an even more dramatic effect. By mid-1940s, six military bases were operating in the valley in or near Litchfield Park, Glendale, Scottsdale, and Mesa. The military found the area particularly attractive for air base facilities due to the calm weather, level ground and open spaces, and its location far enough inland to prevent enemy attack. Additionally, by 1943, three major wartime materials factories operated in the area. At their peak, these plants alone employed nearly 15,000 people. Meanwhile, valley agriculturists contributed to the war effort by growing more cotton and foodstuffs. Salt River Project water and electricity were critical resources that enabled the operation of the war-time industries in the Phoenix area.

When the war ended in 1945, the defense-centered manufacturing boom screeched to a halt and many of the plants and bases closed their gates. The valley economy slumped, and many thought it might regress to pre-war days. Instead, a second boom took firm hold, due to the profusion of water and hydroelectric power provided by the Salt River Project, coupled with the attractive winter-time climate. Large corporations were attracted by relatively inexpensive land, low taxes, and incentives offered to woo them to move to the area. However, this post-war boom was multifaceted and would prove to have long-lasting effects. Armed with the GI Bill and enticed by the dry desert air, returning war veterans came to the valley, purchased homes, started businesses, or returned to school. At the other end of the age spectrum, retirees flocked to the valley, living in planned retirement communities like Del Webb's Sun City complex near Peoria. And by the early 1950s, the same factors that encouraged veterans resulted in a tourism boom that would account for nearly $180 million in annual expenditures within the state—nearly triple pre-war levels. Tourism would continue to grow, bolstered by President Dwight D. Eisenhower's Federal-Aid Highway Act of 1956, which would establish the interstate highway system that would connect cities across America. They also found Project reservoirs attractive for increasingly popular water-based recreational activities.

But the single most significant factor that enabled the growth of post-war Phoenix was the development and perfection of air-conditioning technology. While window evaporative units ("swamp" coolers) had been around since the 1930s, they provided relief only when the relative humidity was low, and were ineffective in the more humid monsoon months of August and September. In the late 1940s, with metals once again available and improvement in technologies, and with an abundant supply of electricity available from Salt River Project facilities, "refrigerated air" entered the picture to help cool homes and businesses. The early air-conditioning units were window mounted. But the perfection of central air technology in the 1950s, coupled with the decision in 1957 by the Federal Housing Authority to finance new homes built with central air units, resulted in one-fourth of all valley homes having central air by the 1960s. With summer's heat tamed, the valley became a choice place to work and play year-round. Phoenix also became a manufacturing center for this technology. As a result, the 1950s was the valley's

most explosive decade in terms of population growth; the population tripled or quadrupled in Phoenix and most surrounding cities (see Section J, Table J7).

By 1980, a major shift had occurred in the valley—urban and suburban growth exceeded agricultural growth. Increasing land value and rising farming costs led many farmers to sell their land to residential and commercial developers. Some retired as instant millionaires, while others relocated their farming operations further into the desert, to the delight of new suburban residents who disliked agricultural odors and worried about pesticide use. Outlying communities, like Glendale and Peoria lying northwest of Phoenix, and Gilbert and Chandler to the southeast, soon transformed from purely agricultural communities to full-fledged residential and commercial suburbs. Strip malls, residential developments, and freeways now shared the valley's built landscape with canals and laterals. Phoenix sprawled and annexed new areas, to the point that by the 1980s it encompassed just under 400 square miles of land and was among America's 10 most populated cities (see Section J, Table J8). The Salt River Project remained vital to the valley's life. As of 1978, Project electricity served over a quarter million people, and it provided about half of the water used by valley residents. Municipal water customers totaled 1,098,700, and another 5,090 customers received water for industrial purposes. And, still honoring its original purpose, Project canals delivered water to 15,997 farms.

EPILOGUE: A DYNAMIC URBAN CENTER

Those ambitious Reclamation engineers and Association leaders who planned and implemented the Salt River Project in the early 1900s, as well as the pioneers and ancients that preceded them, might be shocked at the valley's drastic transformation in a 100 year period of time. Reclamation's original intent was that the Salt River Project, as with all Reclamation projects at that time, would provide irrigation water to assist the small family farmer to become self-sufficient—fulfilling the Jeffersonian ideal—and to help build the local agricultural economy. However, broader events and social processes in the Salt River Valley transformed these idyllic and narrowly focused aspirations into something much larger and more complicated in terms of needs and services. Thus, the Project's historical development since 1903 can be divided into two periods: the pastoral, from authorization through World War II; and the urban, from the war's end to the present. In the first period, agriculture was all important, and as the Project matured and more storage and carriage facilities were built and improved, irrigated acreage and agricultural output steadily increased.

In the 1930s and 1940s, however, broader historic forces merged to initiate a transition from a predominately pastoral to a more urban focus. The rise of tourism and its related service industries, the expanded and improved transportation network, the valley's role in America's World War II defense industry infrastructure, coupled with the availability of more water and electricity as additional Project reservoirs and powerplants were built, came together to plant the seeds for the more profound changes of the post-war decades. The most significant factor triggering the transition were the social and economic changes caused by World War II, and the valley was a microcosm of larger economic forces

reshaping the American West during this time. But as nuclear bombs dropped and the war ended, returning veterans led the influx of people and industry to the area made more habitable by the availability of air-conditioning technology. Metropolitan Phoenix spread, engulfing former farmland, until irrigated acreage fell to levels not seen since before Salt River Project canals first began to deliver Project water in 1911.

If one looks at the Project's original purpose, the reclamation of arid lands to support small family farms, it met this purpose within a decade. Agriculture remained the Project's focus for its first four decades, with the added benefit of hydroelectric generation from waters stored in Project reservoirs. Then, increasingly over subsequent decades, socioeconomic patterns shifted in the Salt River Valley, a pattern also evident in larger regional, national, and global contexts, but enabled here in the hot, dry Valley of the Sun by the water and electricity made available by the Salt River Project. As farmers sold their land for urban development, the Project adjusted to support the changing needs and priorities of valley residents. The Salt River Project, and the valley it helped shape and mature, moved with the currents of historical change. The result was the creation of one of America's most dynamic urban centers.

ASSOCIATED PROPERTY TYPES

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. Property types associated with the Salt River Project consist of structures built for the storage, diversion, and delivery of water and for the generation of hydropower. They include storage-regulation dams, diversion-conveyance systems, and powerplants, and can also include auxiliary construction works and ongoing support features.

The Salt River Project is a continuous, linked system composed of widely spaced dams and reservoirs built to provide a regulated supply of water to an interconnected system of canals. All component parts play a role that is integral to the success of the work. Project-supplied water and hydroelectricity has enabled agriculture and communities to thrive in the Salt River Valley, and significantly contributed to the transformation of the Phoenix metropolitan area into the sixth largest urban area in the United States by the late 20th century.

General Eligibility Requirements

For a property to be nominated under this Multiple Property Document (MPD), it must meet all three of these general eligibility requirements:

1. Be associated with the Salt River Project, have been built during the period of significance; and illustrate the theme and one or more historic contexts of this MPD,
2. Be eligible for the National Register, meeting one or more National Register criteria as defined within this MPD, and
3. Retain historic integrity.

A resource may be nominated as an individual property, or be nominated as a contributing feature to a historic district. A historic district must possess a significant concentration or linkage of resources united historically by plan, function, or physical development, and must be a distinguishable entity. A district's component parts need not always possess individual distinction. An example of resources that might comprise a historic district within the Salt River Project would be the diversion dam and the main water delivery and drainage system it serves; representative examples of lateral canal system features to characterize how the full system operates; a powerplant built on a canal to utilize its water flow to generate hydroelectricity; associated contiguous auxiliary features such as ditchrider houses or maintenance yards; and, archeological sites that are the remains of construction camps to build those features.

To be eligible under **Criterion A** under the Salt River Project MPD, a property must be associated with, illustrate, or characterize one or more aspects of the important role the Project played in the early

20th century development of the Federal reclamation program or illustrate the Project's contribution to defining Reclamation's broad policies and practices, or must illustrate or document the Project's role in the historical development of the Salt River Valley from the Pioneer through Federal periods of significance. It is most likely that an individual property or related groups of properties (i.e., a historic district) would be eligible under Criterion A as representing the areas of significance of agriculture, politics/government, settlement, social history, and/or engineering.[1]

To be eligible under **Criterion B** under this MPD, a property must be associated with a person that made important contributions to the establishment, growth, or operation of, or played a significant role in historic events shaping, the Salt River Project. A property might also be eligible for association with the works or career of a person who played a significant role in development of the Federal irrigation program and who was associated with the Project's origins and development. For a property to be eligible under this criterion because it was designed or constructed by an historically important individual, the property must be a representative example that substantially illustrates those contributions or the person's achievements over their lifetime (i.e., be one of their master works), or be the best extant example of their work; these kinds of properties will often also be eligible under Criterion C. Examples of properties that can be eligible under Criterion B are the building in which a prominent Reclamation engineer prepared his most important designs of Project works, and also key Project works that person designed. It is most likely that an individual property or related groups of properties would be eligible under Criterion B as representing the areas of significance of politics/government, industry, and/or engineering.

To be eligible under **Criterion C** under this MPD, a property typically must demonstrate significance in terms of engineering design or construction methodology or practice. This significance may be specific to the Salt River Project, or represent a particularly important development that altered Reclamation's engineering or business practices as a whole, or that influenced engineering or construction practice beyond Reclamation. Those significant for the latter two reasons could potentially be of a national level of significance. Properties that are historically important may qualify, or that are exemplary or the best remaining examples of the work of an important engineer or architect. A property may be eligible that is the earliest example, the best example, or the best preserved or sole surviving example of a particular property type, either on the Project or in a wider Reclamation or general engineering scope. A property may be eligible if it exhibits an innovative or experimental approach to water storage or conveyance or hydropower generation, either for its contribution to Project development or in a wider scope. Under Criterion C, properties may also be eligible because they exhibit unique characteristics, or conversely

[1] Project dams and main canals nominated concurrent with the development of this MPD have primarily been evaluated under Criterion A because their impact upon the historical development of central Arizona is a clear and convincing basis for listing. These properties have the potential of also being eligible under Criterion C, but were not evaluated as such as part of their nomination. Historic American Engineering Record (HAER) documentation has been completed for most principal Project works. See the Section 8 continuation sheet attached to this MPD for nearly complete presentations of the context statements from those HAER documents.

because they are a particularly good representative example of a type of property that is common but important to the operation of the Project irrigation or hydropower system. In the latter case, the representative property must possess, to a high degree, the distinctive characteristics, features, or traits of that property type, and retain a high degree of integrity. It is also important to differentiate those resources significant at the national level for their unique technological and/or engineering aspects, and those significant at the state or local level as good representative examples within the Project system.

To be eligible under **Criterion D** under this MPD, a resource must contain materials that can provide information to aid scholarly and scientific investigation to better understand specific activities or events associated with the growth and development of the Salt River Project, or to better understand historical changes in the landscape and settlement patterns resulting from Project development. In order for a property to be eligible under Criterion D, the physical property itself must be a principal source for information to address research questions about that property or the Project, or about the valley's development because of the Project, or about the valley's development because of Pioneer Era or Association irrigation or hydropower developments that became part of the Project. Criterion D most often is applied to archeological sites. For example, the remains of a dam or canal construction camp could be eligible under this MPD because of the information it could yield about the living conditions for laborers in the camps, or how the construction plant was organized. Criterion D can also apply to investigating areas around buildings, structures, and objects that are eligible under other criteria, in order to better understand the historical development and use of that property. For example, excavations in or near a canal may reveal stages of renovation and earlier construction practices. Rarely, an actual building or structure may be found eligible for their information potential from the study of non-archeological (i.e., structural) materials.

PROPERTY TYPE I: STORAGE-REGULATION DAMS (5)

Description

All Salt River Project storage-regulation dams impound and store surplus run-off and flood waters for future use and regulate releases of water for irrigation. Four dams (those on the Salt River) also have associated powerplants that generate hydroelectricity using released water. Although not an official Project purpose until after 1995 modifications of Roosevelt Dam, all the dams have also always provided a measure of flood control to the Salt River Valley. Theodore Roosevelt Dam, the upper-most dam on the Salt River, is the principal water storage facility, while each of the three smaller dams downstream recapture, regulate, and control releases from Roosevelt Dam. There are two Project dams on the Verde River that store and regulate water for Project purposes. Extreme fluctuations in water flow on the Verde make it unsuitable for hydropower generation, and so those two dams have no powerplants.

Each dam is a unique design, developed to address specific conditions and operational requirements at their site. The designs, as well as modifications to the built structures, also reflect changing engineering practice, technological capability, and operational standards over the decades of the first half of the 20th century. Designs were also influenced by political, social, and economic requirements and objectives prevalent when each was constructed. Reclamation engineers designed Roosevelt and Bartlett dams. They are, respectively, a cyclopean masonry thick arch dam, and a concrete multiple arch dam. These two design types illustrate evolving engineering design concepts. Roosevelt Dam represents the massive approach of the 19th and early 20th centuries, which assumed that great weight equated to greater stability. Bartlett Dam represents the evolution of engineering science toward the recognition that less massive dams with structural elements (buttresses, in this case) that distributed water pressure to the abutments and foundation could provide equal or better stability at a lower cost to construct. The remaining dams were designed by engineers with other entities, with the final designs approved by Reclamation. Association engineers designed the three lower Salt River dams, all concrete thin arch designs, and engineers with Phelps Dodge and the Defense Plant Corporation designed Horseshoe Dam, an earthfill embankment dam.

Each of the Project dams has undergone some degree of modification since they were constructed, principally to the dam spillways. Spillway modifications, or modifications in general to a dam's outlet systems, reflect responses to changes in operational standards occurring throughout the 20th century. Modifications are to be expected for dams well over 50 years in age, with materials and equipment subject to wear and tear that must be kept in safe operating condition. As further defined below in the section defining Registration Criteria, modification does not necessary cause a dam, or indeed other type of property identified in this MPD, to be considered ineligible for the National Register.

Storage-regulation dams typically consist of the dam structure itself, plus water outlet structures that control and regulate the flow of water from the reservoir to the river below the dam. These outlets can be internal to the dam's own structure or can be located nearby. Common water outlet structures are spillways, sluices, conduits, and power penstocks, and each typically has a weir, gates, or valves that control water flow into and through the outlet. There is equipment in place to operate gates and valves, which is housed on decks over the gates, in gate or valve houses, or in galleries within the dam. There usually are structures to protect outlets from debris. Some dams may include appurtenant structural or operational components, equipment, and fixtures (e.g., bridges, mobile cranes, elevators, lighting, staircases, etc.). These are part of the property, and individual dam nominations under the MPD need to indicate if these features are or are not contributing to the historic character of the dam. They are usually contributing if they are from the original period of construction or from a historically important modification made within the period of significance defined for the property type in this MPD. However, it is not required under this MPD that all components of the dam and associated operating features be included in a nomination of the principal dam structure. [2]

[2] The description above identifies all storage-regulation dam components that could potentially contribute to a property's eligibility; however, the interior components of Project dams will not be included as eligible under this MPD.

Features representing other property types may be associated with storage-regulation dams, such as powerplants, administrative or shop buildings, or archeological sites consisting of features or material remnants from dam construction. These are defined as separate property types under this MPD, but should be considered when establishing the National Register site boundary for the storage-regulation dam property.[3]

Significance

Under this MPD, Project storage-regulation dams can be significant under **Criterion A** for their association with the Salt River Project, which shaped the 20th century development of the Salt River Valley and Phoenix metropolitan area, the development of which helped obtain statehood for Arizona. The dams are the functional heart of the Federal project. Without the storage created by dam construction, agricultural potential was limited in many areas of the West, and perhaps more than usually limited in the very hot and arid climate of central Arizona. Typically, a storage dam was the component of irrigation project development that was farthest beyond the financial capability of private enterprise, and so the Project dams represent the benefit brought to central Arizona communities and economy by the Federal government's entry into the "irrigation business." Additionally, dams with unique engineering features or where groundbreaking design or construction methods were devised or tested, or that represent a masterwork of an important individual, could also be eligible under **Criteria B or C**. Project dams might, therefore, represent some or all of the areas of significance of agriculture, politics/government, settlement, invention, and/or engineering.

Registration Requirements

For a Project storage-regulation dam to be individually nominated under this MPD, it must:

1. Fulfill the three General Eligibility criteria defined above. It must fall within the period of significance for Salt River Project storage-regulation dams under this MPD, which begins in 1923 with the construction of Mormon Flat Dam, the first storage facility built after Roosevelt Dam, and ends in 1951 with completion of modification to the spillway gates at Horseshoe Dam. [4]

[3] Not all features associated with, but physically separated from, a dam need be evaluated at the time the dam is nominated. For example, a dam construction camp or associated damtender's housing can be evaluated at a later time. A decision to not include them in the nomination of the associated dam does not signify they are not of historic significance or that they may not be determined eligible at a later time, or nominated under this MPD or separately, unless so stated in this MPD or in the dam nomination. Boundaries are encouraged to encompass the full extent of significant resources and land comprising the property.

[4] Theodore Roosevelt Dam, formally designated as a National Historic Landmark, has been so altered that it has no historic integrity and has been delisted. It is not eligible to be nominated again under this MPD.

2. Meet one or more of the following criteria:
   Criterion A: is demonstrably associated with the agricultural and economic development of the Salt River Valley or the State of Arizona, or is associated with or representative of the political/governmental events instrumental in the development of the Salt River Project irrigation or hydropower system, or in Reclamation's and/or the Association's history.
   Criterion B: best represents important contributions of a person who is significant in engineering or Reclamation history, or in the overall realization of the Salt River Project.
   Criterion C: exemplifies the distinctive characteristics of a certain type of dam or method of design or construction; embodies the work of a significant engineer or builder; or represents a significant step in the evolution of technology, dam design, or construction practice, or an innovative solution to an engineering design, construction, or operational problem.
3. Retain historic integrity. Dams and their related structural and operational features require continual maintenance and periodic repairs or replacement of elements to keep them operating safely and efficiently. Parts such as gates or valves may have been replaced due to wear or to incorporate an improved design. This may also trigger replacement of associated operating equipment and modification of housings. Structural modifications may have occurred to address new standards, safety concerns, or deterioration of materials, for example, modification of a dam's spillway to meet new operating standards. Some of the modifications occurring within the period of significance may not represent a loss of integrity. They may, instead, illustrate the evolution of the Salt River Project in response to changes in requirements of the agricultural and urban community living in the Salt River Valley. Dams may be raised in height to increase storage capacity. If the raise is minor, as in the case of Bartlett Dam, it may entail little change in the original design and the property may still retain historic integrity.

For a dam to be deemed eligible for the National Register under this MPD, it must at a minimum retain overall integrity of location, design, workmanship, materials, and association. It is acceptable that some elements will have been altered, but they cannot have so altered the elements that fundamentally define the character, function, or design of the dam that the original design and materials are no longer readily apparent. This is true even when the dam is primarily significant under Criterion A; it cannot represent the historic events or processes if it lacks fundamental physical integrity of design and materials. If the basis for a dam's historic significance is that it was the location where important engineering or technological innovations were first implemented, those features must be present and the characteristics that represent the innovation must retain a high level of historic integrity. It is desirable, but not essential, that the current setting embody the overall character of the historic setting. If elements of design, workmanship, materials, and setting are intact for a dam, then integrity of feeling and association are also maintained.

Reservoirs are associated with storage dams, and are vital features of any irrigation project. However, the inclusion of a reservoir in a dam nomination is problematic, largely because it raises complicated questions about the inclusion of other resources on the lands around and within the reservoir. Thus, reservoir inclusion is not a prerequisite for eligibility of the associated dam.

PROPERTY TYPE II: DIVERSION-CONVEYANCE SYSTEM

Description

Water stored behind a Project dam is released into the Salt or Verde River to ultimately be diverted out of the Salt River at the Granite Reef Diversion Dam into a conveyance system that carries water to farmlands and cities. The Project conveyance system involves more than 130 miles of main canals, as much as 924 miles of laterals and ditches, and 250 miles of drains. Associated with the canals, laterals, ditches, and drains are numerous appurtenant features of various types that play an integral role in water conveyance. Some are structural/operational components of the canal itself (examples, headworks, chutes, and drops). Others are separate features, but in most cases would not have been constructed except to perform a particular function in the operation of the conveyance system (e.g., gauge stations, bridges, and ditchrider houses). For the most part, therefore, appurtenant features derive their significance as operational features of the canal or larger conveyance system, and would typically not be viewed as individual properties or be eligible separate from the main structure.

Concurrent with preparation of this MPD, a historic district nomination is being prepared that encompasses many principal features of the Project's diversion-conveyance system (Granite Reef Diversion Dam, with the associated Southside Gatekeeper's House, and the system of main canals with related and attached appurtenant features key to operation of those canals, as well as the Crosscut Hydro Plant, which operates using water from the New Crosscut Canal). They are nominated as resources within a single linear district, and not as a series of individual properties.[5]

Property Subtype A: Diversion Dam (1)

A diversion dam is a permanent low dam or weir constructed across a river, which backs up water in the river, thereby raising the surface elevation so that water flows into the headworks of one or more canals built in close proximity to the diversion structure. A single diversion dam, the Granite Reef Diversion Dam, exists on the Project. Completed in 1908, it is located on the Salt River about 50 miles downstream of Theodore Roosevelt Dam and 4 miles below the confluence of the Verde River with the Salt River. It is a concrete weir with wing walls, a stone and concrete downstream apron, two

[5] The description above identifies all diversion-conveyance system components that could potentially contribute to a property's eligibility; however, the lateral, sub-laterals, and drains will not be included as eligible under this MPD. This is primarily because many of the secondary conveyance features are located on easements within private property, with complicated land ownership patterns.

sluiceways controlled by gates (one sluiceway located at either end of the weir), and flashgates on the crest of the weir. The headworks for two canals are located at the dam, and were built in association with the dam's construction. The headworks for the Arizona Canal is at the dam's north end and the headworks for the South Canal at its south end. An original gatekeeper's house is located on the south side of the river within 200 feet of the dam. A similar gatekeeper's house was built on the north side of the river near the dam, but it was destroyed in a flood. The diversion dam's period of significance extends from 1906 through 1920, which encompasses its construction and early modifications to address high flow and sedimentation problems that were not anticipated in the original design. Those modifications do not impact the structure's historic integrity.

Property Subtype B: Main Canals (9)

The Project main canal system consists of two unified networks of interconnected canals, one on the north and one on the south side of the Salt River, receiving water from headworks at the Granite Reef Diversion Dam. There are nine main canals that retain sufficient integrity to be nominated under this MPD.[6] These are, for the north side main canal system, the Arizona, Grand, and New Crosscut canals, and for the south side main canal system, the South, Eastern, Consolidated, Tempe, Western, and Highline canals (the Highline Canal consisting of the North and South Highline Laterals). All canals are located on Reclamation fee or easement land. The period of significance for the main canals is 1906 through 1938. Original construction of the Arizona, Grand, Tempe, and Consolidated canals occurred during the Pioneer Era of valley settlement and irrigation development. Reclamation began to purchase the Pioneer Era canals in 1906 to incorporate them into a unified system under the Salt River Project, and through 1927 instituted a program to enlarge the canals to serve a larger area. The modified canals were open earthen ditches with structures (see appurtenant features sub-type below) to control the flow and distribution of water through and from the canals. Due to funding limitations, originally most internal canal structures were built of wood, and few sections of canals were lined. In the 1930s, largely using Civilian Conservation Corps (CCC) and other New Deal labor and funding, Reclamation replaced the wooden structures (always intended to be temporary) with concrete structures, and began installing concrete lining to control bank erosion and reduce water loss. This work largely ended in 1938, when Reclamation ceased utilizing CCC workforces.

Property Subtype C: Lateral Canals

A system of lateral canals carries water from the main canals to farm ditches. They were originally open dirt ditches. However, as the cities of the Phoenix metropolitan area grew, farm fields were converted to subdivisions, and components of the secondary distribution system were moved and open laterals converted to buried pipe. A large portion of the lateral canal system now carries water for urban use, as

[6] There are two additional main canals that have been so altered that they have no historic integrity and cannot be nominated under this MPD or included as part of the Diversion-Conveyance System Historic District. These are the original Crosscut Canal and the San Francisco Canal.

agricultural land continues to disappear. An inventory completed in 2012 confirms that a significant percentage of the lateral canal system has been modified. Of the approximately 120 miles of Project open lateral canals inventoried in 2012, Reclamation, SRP, and the Arizona State Historic Preservation Office concurred that 27 miles of laterals warrant preservation.[7]

It is anticipated that individual canals within the Project lateral canal system would rarely be individually eligible, but representative examples of those with historic integrity may be contributing properties to a historic district.[8] The period of significance for the lateral canal system is anticipated to be generally the same as for the main canal system (1906 to 1938).

Property Subtype D: Drainage System

In 1911 Roosevelt Dam was completed and began to store water for irrigation use, greatly increasing the water supply for farms of the Salt River Valley. As irrigation increased, the water table in the valley began to rise by an average of 1.5 feet per year, with associated waterlogging threatening to destroy crops and cause a buildup of salts that could ruin the soil. Reclamation and the Association began studies to identify means to improve drainage, and devised a pump system that would remove water from saturated areas into existing distribution canals or into newly-built drains. Initially, 20 pumping units and more than 300 miles of drains were built. Water pumped from waterlogged areas was then re-used elsewhere, thereby increasing the available water supply and enabling additional lands to be watered. The need for a drainage system was the principal factor that led to the Tempe Canal Company bringing its canal system and water rights under the Project in 1923. The initial Project drainage facilities were constructed between 1917 and 1925, the period of significance for the drainage system under the MPD. Additional pump units continued to be constructed; there were 248 in use as of 1977. It is anticipated that individual pumps and drains within the Project drainage system would rarely be individually eligible, but representative examples of those with historic integrity may be contributing properties to a historic district.[9]

Property Subtype E: Appurtenant Features

These are small structures or operational features or devices that are integral to the functioning of a canal or the conveyance system. They can generally be divided into categories according to their purpose: conveyance, regulating, water measurement, and protective structures or objects. The examples provided for the general subtypes are not exhaustive, and other specific kinds of structures,

[7] The Project continues to evolve to accommodate the changes in the Salt River Valley landscape, as agricultural lands are converted to new urban and commercial uses. Project works created or modified as part of this ongoing conversion cannot be nominated under this MPD, as they lie outside of the period for the diversion-conveyance system.

[8] The description above identifies all lateral canal system components that could potentially be eligible and contribute to a historic district; however, the lateral canals will not be included in nominations under this MPD.

[9] The description above identifies drainage system components that could potentially be eligible and contribute to a historic district; however, the drainage system and its features will not be included in nominations under this MPD.

features, and devices that are identified on the system can be included if they fulfill the requirement of being integral to the function and operation of the diversion-conveyance system or a system feature. The period of significance for an appurtenant feature is the same as for the canal or lateral canal with which they are associated.

Conveyance Structures or Devices are features of a canal, lateral, or drain used to transport water across, under, or through natural or manmade barriers to the flow of water through the canal. These features include culverts, crossings, siphons, drops, chutes, flumes, tunnels, and pipelines. They can also include pumps, pump houses, and associated operating equipment.

Regulating Structures are used to control, raise, lower, or direct the release and volume of the water flow into and through a conveyance system feature. These include the headworks at the inlet of a canal, and associated gates and operating structures or equipment, such as the headworks at Granite Reef Diversion Dam to the Arizona and the South canals. Sometimes a canal has a heading from another canal, and associated structures can include bifurcation structures or division boxes controlled by gates. An example of such structures is where the South Canal terminates and its waters are delivered into the Tempe and Consolidated canals. Regulating structures are also located along the course of a canal, lateral, and some drains, examples of which include checks and turnouts, which are the basic regulating components of any irrigation system. Where structures were once operated manually, SRP now uses Supervisory Control and Data Acquisition (SCADA) devices that remotely control gates from a dispatch center.

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. Drops and chutes typically are used to control the rate of flow in a segment of canal that runs down a slope, serving to prevent erosion of the canal's internal structure. Wasteways carry water from one canal to another canal or drain, or into a natural watercourse. Protective bulkheads and bank protective structures built outside of the canal direct surface water away, to prevent erosion of canal banks or nearby lands that might undermine the canal. Regulating structures (turnouts, gates, etc.) may be associated with some protective structures.

Water Measurement Structures and Devices are used to gauge water flow and deliver the correct amount to another conveyance feature or to a field. Many different types of water measurement structures are used in irrigation systems. The type most commonly used in Reclamation systems are Parshall flumes, weirs, and water measuring and recording devices. Some measuring/recording devices are housed in gauging stations.

For the most part, appurtenant features derive their significance as operational features of a larger conveyance system main or lateral canal, and would typically not be viewed as individual properties or be eligible separate from the main structure of which they are a component or appurtenant part (e.g., the headworks of a canal would typically not be eligible on its own, but, as an important operational

component of that canal, would be part of the larger historic property that is the canal). In rare instances, a specific appurtenant feature of a canal or other conveyance system feature may hold significance independent of the main structure if it represents a significant or innovative design or construction technique, is the first or only remaining example of an important operational feature of the Project conveyance system, or for some other specific cause. The period of significance for an appurtenant feature is the same as that for the main work that with which it is associated.

Significance

The development and growth of the Salt River Valley resulted from an integrated system of storage dams and a diversion-conveyance system that provided a reliable water supply to the valley, enabling the full development of its agricultural potential. This in turn established a strong economy that supported the growth of communities, and ultimately triggered the social and economic transformation of the valley and its communities, both agricultural and urban. Project water, delivered through the diversion-conveyance system, significantly contributed to the transformation of the Phoenix metropolitan area from collection of small towns at the dawn of the 20th century into the sixth largest urban area in the United States by the close of that century. The diversion-conveyance system represents the areas of significance of agriculture, politics/government, and settlement.

Registration Requirements

Reclamation intends to nominate components of the diversion-conveyance system as a historic district. For a feature to be contributing to the Project diversion-conveyance system historic district under this MPD, under this MPD, it must:

1. Fall within the period of significance for Salt River Project diversion-conveyance system, which begins in 1906 and ends in 1938, with the date of completion for the initial phase of Project canal development. The starting date of 1906 represents when Reclamation began construction of the diversion dam and first began to purchase Pioneer canals and build new canals for the Project system. The four Pioneer canals eligible under this MPD were all built prior to the date of the Salt River Project authorization in 1903, but were enlarged and otherwise modified by Reclamation after 1906 as part of effort to create the unified and expanded Project conveyance system.[10] The end date for the period of significance is defined by the end of CCC work to improve the canals.
2. For a feature to be contributing to a historic district, it must meet one or more of the following criteria:
   Criterion A: is demonstrably associated with or representative of the agricultural and economic development of the Salt River Valley; political/governmental events instrumental in

[10] Reclamation's modification to the four Pioneer Era canals so altered the design and character of these canals that they will be treated as Federal Era properties and not as Pioneer Era properties under this MPD; their period of significance is 1906 to 1938.

the development of the Salt River Project irrigation system; events leading to Federal purchase of canals or of irrigation entities joining the Project; important events in the construction or early modifications of the diversion-conveyance system; actions to resolve operational issues; and/or other historical events or processes in the establishment, construction, and operation of the system.
Criterion B: best represents contributions of a person who is significant in engineering or Reclamation history, or in the overall realization of the Salt River Project and its diversion-conveyance system.
Criterion C: is a particularly historically or operationally important component of the diversion or conveyance system; or represents the distinctive structural or operational characteristics of a certain type of canal, lateral canal, or appurtenant feature, and representation of that type is important for understanding the Project diversion-conveyance operational system as a whole; or represents the work of a significant engineer or builder.
Criterion D: has the potential to provide important understanding of the construction of the diversion dam or conveyance system, or changes in its structural or operational character over time.

3. Retain historic integrity. Diversion dams, conveyance systems, and their related structural and operational features require maintenance and periodic repairs or replacement of elements to keep them operating safely and efficiently. Project features have also been altered in response to the urbanization of the valley. The fact that alterations have been made to the diversion dam or a conveyance feature does not disqualify the feature from being nominated under this MPD if it retains sufficient fundamental aspects of its historic character to be able to convey its design and operational characteristics, either as originally built or as modified as part of the evolution of the system during the period of significance. After that requirement is met, the nature and extent of modifications that are acceptable is in good part dependent upon the reason for which the feature is nominated. To be eligible to be a contributing property to a historic district requires a lesser level of historic integrity than would have been expected for a property that would be individually eligible.

   Modifications made within the period of significance that extended the main canal system to its finished size, that resolved structural or operational problems with original designs, or that realized original design objectives are considered to represent important historical processes associated with the growth and development of the Project system and do not negatively impact historic integrity. One example of such modifications are the structural changes and repairs made in the 1920s to Granite Reef Diversion Dam to resolve sedimentation issues and to enable the dam to better withstand and pass high volume flood flows. Other examples are the late 1920's program to widen and line the Consolidated Canal to extend the service area, and the concrete structures and linings installed by the CCC. Modifications made by the CCC to irrigation systems are also often considered historically important because of their association with that New Deal program. Conversely, many modifications associated with later, post-World War II urbanization of the Salt River Valley negatively impacted the historic

integrity of facilities by eradicating the character-defining features of the historic property (e.g., the conversion of open canals to pipe).

The registration requirements defined above for storage-regulation dams shall also apply to the diversion dam.

Main canals, lateral canals, and appurtenant features must, at a minimum, retain overall integrity of location, design, and association to be assessed as contributing to the historic district nomination under this MPD. Generally speaking, to retain integrity of location, the canal must follow its original route (some relocation of sections is allowed). It is desirable, but not essential, that the current setting embody the overall character of the historic setting; the change from the original agricultural setting to an urban setting is not alone the basis for a canal considered to lack integrity. To retain association, it must still represent the Project purpose for which it was designed, even if it is no longer used for that purpose. Overall integrity of design for a canal means, at a minimum, it retains its form (e.g., open ditch, buried pipe, etc.) and design configuration (prism) for at least a portion of its length, and also retains representative examples of the types of appurtenant features key to its operation that were built during the period of significance. Retention of original materials is important, but a canal that was originally an unlined dirt ditch is not rendered ineligible for nomination under this MPD if it has been lined for some of its length after the period of significance, or when a portion of an open canal or ditch has been converted to buried pipe. However, alterations cannot be so extensive that the character, function, or original design of the feature is no longer readily apparent. At least some sections of the canal must retain original materials (e.g., dirt or lining, appurtenant features) that represent the period of significance. Modifications of appurtenant features would not render a canal non-contributing, as long as representative examples of important feature types remain. When a main canal or key lateral canal has been altered (i.e., piped) or relocated for a portion of its total length, the altered segments would be non-contributing. Canals that have been entirely piped or relocated cannot be considered contributing to the historic district or otherwise nominated under this MPD.

Generally, if a main canal is determined to lack historic integrity, then the secondary systems under that main canal would no longer be considered eligible for inclusion as contributing properties to the historic district. Exceptions could be made for a sub-feature that is either the best remaining example on the Project conveyance system; or is directly associated with a particular incidence of particular importance in Project history; or that is individually eligible under Criterion B or C for reasons unrelated to the physical integrity of the main canal.

PROPERTY TYPE III: POWERPLANTS

Description

In addition to the primary purposes of storing flood water and providing irrigation water, the Project provides hydroelectric power through five small powerplants integrated into their respective dams and a canal. This power is dedicated first to meeting the requirements of project facilities, such as pumping power for project water and station service at pumping and generating plants and project construction facilities.

The first permanent Project powerplant was built at Roosevelt Dam in 1907 and expanded in 1909, at which point it first began to deliver power to Phoenix. However, Reclamation needed additional electricity to run pumps on the Project conveyance system, and therefore in 1910 signed a contract with the Association to build two small powerplants and refurbish two existing powerplants on the Project canal system. Transmission lines were built from the canal powerplants out along the Project conveyance system to operate system pumps. This electricity was soon put to use to run the pump drainage system, which was essential to resolving the waterlogging of lands on the Project. Visionaries in the Association, however, wished to also utilize the irrigation releases flowing down the Salt River to produce more electricity. They therefore built three dams with powerplants on the river to be able to generate power when the market had a demand for electricity, rather than only when irrigation water was needed for the canals. The Association used the additional revenue to subsidize payment of water delivery costs, to pay portions of expansion costs, and to repay the Project construction debt.

Three of the canal powerplants are no longer extant; they went out of service and were demolished many years ago. The Roosevelt Dam powerplant and associated transformer house were listed on the National Register in 1998 as contributing properties to the Theodore Roosevelt Dam National Register District, and the will therefore not be nominated under this MPD. The Crosscut Hydro Plant and the powerplants at Horse Mesa, Mormon Flat, and Stewart Mountain dams, during the period of significance, will be nominated under this MPD.

Significance

Powerplants are significant for the role they play in generating electricity essential for Project operation, and for producing revenues that aided in Project repayment and funds operation and maintenance. The construction of the powerplants made the Project one of the few in the 1920s and 1930s that was able to meet repayment obligations. The expansion of the power system increased the electricity available for sale to both urban and rural areas of the valley. The rural community of the Salt River Valley received power years prior to the passage of the Rural Electrification Act in 1935. The hydropower generated at the Salt River dams fed the economic growth of the Salt River Valley and surrounding areas of central Arizona. Power generated was used to support industry, most notably the mining, ore refining, and

cotton processing industries, and provided electricity to homes and businesses throughout the greater Phoenix area, feeding expansion of that metropolis. In the 1960s and early 1970s, modifications were made to the Salt River dam powerplants to upgrade their generative capacity and to add pumped-storage capability. Revenue generated subsidized Project farmers and was the foundation for the growth of the SRP as a commercial utility entity. Powerplants under this MPD would represent the areas of significance of agriculture, politics/government, and/or engineering.

Registration Requirements

For a powerplant to be nominated under this MPD, it must:

1. Fulfill the three General Eligibility criteria defined above. It must fall within the period of significance for Salt River Project powerplants, which begins in 1913 with the completion of the Crosscut Hydro Plant and ends in 1972, with completion of the pumped-storage generating system at Horse Mesa Dam.
2. Meet one or more of the following criteria:
   Criterion A: is demonstrably associated with the agricultural and economic development of the Salt River Valley or the State of Arizona, or is associated with or representative of the political/governmental events instrumental in the development of the Salt River Project irrigation or hydropower system, or in Reclamation's and/or the Association's history, or in the mining development of central Arizona.
   Criterion B: best represents important contributions of a person who is significant in hydropower engineering or Reclamation's hydropower program developmental history.
   Criterion C: exemplifies the distinctive characteristics of a certain type of powerplant or method of design or construction; embodies the work of a significant engineer or builder; or represents a significant step in the evolution of hydropower technology, or an innovative solution to a powerplant's design, construction, or operational problem.
   Criterion D: has the potential to provide important understanding of the construction of the Crosscut Hydro Plant, or changes in its structural or operational character over time.
3. Retain historic integrity. The same issues surrounding the historic integrity of dams apply to powerplants. They require periodic maintenance and repair, as well as power generation (e.g., the 1960s power upgrades from 25 to 60 cycle power) and security upgrades. In many cases, equipment is replaced due to malfunction, deterioration, or evolving technology. This is part of a powerplant's ongoing technical progression and does not necessarily preclude eligibility.

   Plants will retain historic integrity if the powerplant building retains integrity of location, design, materials, workmanship, association, and setting, and the key power generating components and operating equipment remain in place within the plant. Loss of integral generating equipment and operational features of the powerplant would almost certainly prohibit nominating a powerplant as individually eligible under this MPD, but it might retain a contributing status within a historic district or the plant building might be a contributing

feature of the historic dam with which it is associated. If architectural style was not of importance at the time the plant was constructed (i.e., if no deliberate aesthetic choices were made when designing the plant and associated features), then loss of some architectural elements of the powerplant building will not foreclose the possibility the plant will be eligible for nomination under this MPD. For example, unsympathetic replacement of windows at the Crosscut Hydro Plant would not alone make that property ineligible individually or as a contributing feature to a historic district unless research indicates the architectural aesthetic was important to the design of the powerplant or its operation.

PROPERTY TYPE IV: AUXILIARY CONSTRUCTION WORKS

Description

This property type encompasses auxiliary features required for construction of dams, powerplants, or diversion-conveyance system features. It may also include features for historically important modification or rehabilitation work for those structures that occur within the period of significance for the primary property type (i.e., dams or canals). This includes, among other things, construction-era residential camps and administrative headquarters, construction plants, cableways/tramways, quarry sites, roads, and telephone lines.

Property Subtype A: Construction Camps

Project construction camps were built to house the hundreds of men needed to build facilities in remote locations. Construction camps were quickly erected and then typically dismantled upon completion of the Project feature. Construction camps existed at all of the storage-regulation dams on the Salt and Verde rivers. At the dam construction sites, there might be multiple camps, with one built and occupied by government staff and the other(s) built and occupied by the construction contractor's staff and laborers. Most residential camps were segregated by racial or ethnic group. For example, Apache Indians that helped build Roosevelt Dam were segregated from whites and other ethnic groups. Typically, camps included an array of residential features such as tents, barracks, mess halls, kitchens, bathhouses, and administrative features, including offices, infirmary, water supply and waste drain systems, and, when possible, telephone lines. The larger camps were small communities that included amenities such as a billiard hall, barber shop, library, and a school.

Investigations to date at construction camps at Theodore Roosevelt, Bartlett, and Horseshoe dams have yielded information on camps and other auxiliary support infrastructure. Investigations at the three Association-constructed hydropower dams on the Salt River yielded less data, largely due to the lack of drawings, photos, and plans. The Cottonwood Creek Apache Camp Historic Archeological Site is listed as a contributing feature in the Theodore Roosevelt Dam National Register District, and so will not be nominated under this MPD.

Property Subtype B: Roads

Reclamation often was required to build or improve miles of roads from the nearest supply point to remote dam construction sites. These roads would remain in use to access the dam, and typically remained the principal route used by the public to access the previously remote area. This sometimes significantly altered the patterns of development and use of the mountainous areas east of the valley. The Apache Trail, now Arizona Route 88, and the precipitous access road to Horse Mesa Dam are two examples.

Property Subtype C: Construction Plant

Dam and canal construction required the establishment of a plant to crush gravel, mix concrete, provide water and power, and to store and prepare the building materials. This involved structures, equipment and machinery, and work areas that were arrayed around the construction site in a manner to aid efficient and coordinated operations. Historic documents provide site maps, photographs, and records that inform us about the construction plant at different sites, and archeological investigations have provided further information. Often remnants that are evidence of these activities and facilities remain at the dam sites. For example, the Construction Zone Historic Archeological Site, a contributing property to the Theodore Roosevelt Dam National Register District, contains remnants of the sand plant, cement mill, powder house, water tank, and clay quarry sites.

Property Subtype D: Quarries and Borrow Areas

The use of stone, earthen material, and concrete in the construction of project dams and some canal features required sources for suitable rock, earth, sand, gravel, and clay. To the extent possible, quarries and borrow areas were located close to the construction site because the cost to transport the materials was high and their movement was time consuming. The most prominent feature of most quarry sites are the holes left by materials removal, but often there are items remaining that provide information about placement of equipment and methods used to obtain and remove material (i.e., leveled areas, footings, anchor bolts, structural debris, waste or unused stockpile materials, etc.). In some instances, remnants of roads or rail systems used to transport the materials to the construction plant or building site may also remain.

Property Subtype E: Cableway/Tramway Systems

Cableway (sometimes called tramway) systems were essential components to the process of building the storage-regulation dams and Granite Reef Diversion Dam. A cableway system was used to transport construction materials across the site and particularly across the river or canyon across which the dam was being constructed. They typically consisted of a derrick-type tower built on each side of the river at the top of the canyon, connected by a moving cable system mounted on the towers. Buckets or flat

carriage platforms suspended from the cables. The more sophisticated cable systems could not only move loads laterally, but could raise and lower them from the top of the canyon down to work areas on the canyon floor. The cable system was powered by steam or electrically driven motors. While the cableways were intended to move materials, historic photographs show they were also used to move people; one photograph shows children being conveyed on an open platform across the deep canyon at the Roosevelt Dam site to reach the school at O'Rourke's Camp. While these systems generally were dismantled after construction was completed, remnants can indicate tower placement and structural and operational characteristics. Remnants are usually concrete footings and pads and anchor bolts, but in some instances may include remnants of the cable powerhouse or equipment, abandoned buckets or platforms, or sections of cable and cable operating mechanisms, or tower materials. The remnants of a cableway system is a feature within the Theodore Roosevelt Dam National Register District's Construction Zone Historic Archeological Site.

Significance

Accomplishing the construction of Project facilities required an array of auxiliary support features. Although typically not impressive engineering works and were often used only for a short time, these support features were nonetheless instrumental to the successful completion of the primary work. Their remnants illustrate the mechanisms and processes to achieve the work, and are significant when they can contribute to telling the "whole story" of the work involved in building the Salt River Project facilities. They may, therefore, represent some or all of the areas of significance of the primary feature with which they are associated. For dams or canals, these are the areas of significance of agriculture, politics/government, settlement, invention, and/or engineering.

Registration Requirements

For an auxiliary feature to be nominated under this MPD, it must:

1. Fall within the period of significance, which begins in 1903, when Reclamation began to build the Apache Trail access road to the Roosevelt Dam construction site, and ends circa 1947 with the completion of Horseshoe Dam. In most instances, however, the period of significance for a specific feature will be defined by the dates of construction of the facility with which they are primarily associated.
2. Meet one or more of the following criteria:
   Criterion A, had a significant function related to the construction of the associated principal Project feature; represent a particular practice of importance at that site or of general importance; is the site of a significant event associated with construction of that principal feature; or continued after the construction period to play a role in the settlement or use of the area.
   Criterion B, is associated with the activities or contributions of someone significant in engineering or Reclamation history or in the overall realization of the Project system.

Criterion C, is a surviving representative example of a primary type of building or structure associated with Project construction, such as a camp bunkhouse.
Criterion D, are the structural ruins or archeological remains of a construction camp or plant that may yield information important to understanding the operation, activities, and people involved in building the Project feature.

3. Retain historic integrity. Construction camps and plant buildings were generally dismantled or moved to new locations once the primary feature was completed, and equipment was moved on to the next work site. As a result, no intact camps, construction plants, or cableway systems exist on the Project (or at any facility on other Reclamation projects).[11] Quarries and borrow areas often remain, but may have continued as material sources after the original feature was constructed. Principal roads built to the dam sites typically remain, but many will have been substantially rebuilt to meet current safety and use requirements. No information is available about telephone lines.

   Isolated buildings or structures from a camp or plant can be contributing to a historic district under Criterion A if they remain sufficiently complete to convey their original structural or architectural design and their function. They may be individually eligible under Criterion B if they retain integrity of design, materials, workmanship, and association, even if they exhibit no particular architectural excellence or uniqueness; this is because they would be a rare survivor of a construction camp building and represent that functional type. Although relocated buildings are not typically eligible to the National Register, because it was common for construction camp buildings to be moved, a camp building that has been moved to a new location at the same dam site or to a different Project construction site for use for Project construction or operations purposes may be nominated under this MPD. Absence of standing structures at a camp or plant location would not render a site ineligible under this MPD if it qualifies for nomination under Criterion D.

   Roads built to the construction sites were sometimes the first improved roads into a remote location, and thereafter continued to be important access routes up to the modern day. For this reason, many have been paved and re-graded, and sometimes widened. Potentially even a modified road could be contributing under Criterion A if it played a particularly important role in the opening of the area to use and it retains integrity of location (route) and its general design characteristics for representative sections. However, it is not the intent to nominate long stretches of road under this MPD, even if much of that road was originally built or substantially improved by Reclamation as a construction access road. Segments of construction access roads to dam sites that are on Reclamation land and are within the visual context of the dam would be appropriate for nomination under this MPD.

[11] Several construction era camp buildings remain at Government Camp at Theodore Roosevelt Dam. These buildings are contributing properties to the Theodore Roosevelt Dam National Register District, and therefore will not be nominated under this MPD, nor will other auxiliary features within that historic district.

Quarries and borrow areas may qualify as contributing elements to a historic district for the feature with which they are associated, when continued use of that source has not eradicated the use during the period of significance. No cableway system remains intact at a Project facility. Remnants (footings, anchors, pads, etc.) that can document the location and provide some understanding of how the system was built and operated may be contributing features to a site.

When a property was originally built as a construction period feature (such as a construction camp barracks), but was modified to serve an operations function (e.g., a barracks that is now a damtender's house), it may be nominated as representing both periods and functions. However, if it is modified in association with continued Project use to the extent that it no longer represents that earlier use or function, then it can be nominated only for its association with the later period of use.

PROPERTY TYPE V: ONGOING SUPPORT FEATURES

Description

This property type encompasses features that were constructed for the operation and maintenance (O&M) of the dams, powerplants, or diversion-conveyance system once placed in service. Examples of this property type may include features that were originally auxiliary works that continued to be used for Project facility O&M. This property type also includes features built specifically for O&M functions, such as damtender's housing, project offices, and service yards. Typically these structures are utilitarian and plain, lacking architectural distinction and with little or no ornamentation. Some may have been built to a standard design used by Reclamation during the period of their construction; these designs were common for the era (i.e., small bungalow in the 1920s, ranch-type in the 1950s). An office, service yard, or house may have other functionally associated buildings, structures, or objects from the period of significance, and may be set in a landscape. When there is a grouping of historically and/or functionally related features within a yard or landscape, it may be appropriate to nominate the grouping as a single property, or as a historic landscape or district, rather than a series of individual properties.

Property Subtype A: Offices

Offices serve as the ongoing administrative headquarters for Project or facility oversight. One example is the Administration Building at Government Hill. This building is also an example of a construction camp (auxiliary) feature continuing in use during the operations period. This particular building is listed as a contributing resource within the Theodore Roosevelt Dam National Register District, and so would not be nomination under this MPD. Often an office will have associated landscaping features, and may have other associated buildings or structures (e.g., work, storage, or parking).

Property Subtype B: Service Yards

Service yards contain the buildings and equipment necessary to provide ongoing support, maintenance, and repairs to Project features and maintenance equipment. Typically, service yards contain warehouses, storage buildings, machine shops, repair shops, and garages, and are set within a yard that may be fenced and have other features such as parking and landscaping. The buildings are usually industrial and utilitarian in appearance. Service yards exist at the dams and in several locations throughout the conveyance system. However, further research is needed to assess if they fall within the period of significance, and to better define their historic significance and integrity.

Property Subtype C: Damtender's, Gatekeeper's, and Ditchrider's Housing

Housing was constructed on the Project for damtenders, gatekeepers, and ditchriders to house workers at facilities that required round-the-clock attendance or daily care. Such houses typically had associated outbuildings (barns/garages, storage sheds, cellars), were set within landscaping, and those from early in the century would have had corrals and likely also garden and pasture areas. After cars were available and rural road systems improved, and as towns grew to within commuting distance of the work locations, ditchriders often chose to live in town, and so the houses were not needed for Project purposes and may have been either sold, demolished, or leased. The southside gatekeeper's house at Granite Reef Diversion Dam is still extant, and the house and associated outbuildings and features from the period of significance are eligible for nomination under this MPD as a contributing resource to the diversion-conveyance system historic district. A recent inventory indicates one ditchrider house exists, but its integrity has not been assessed.

Property Subtype D: Miscellaneous Features

Miscellaneous features may include bridges, fencing, gates, signs, O&M roads, transformer yards, and other features needed to enable the operation of or access to facilities.

Significance

The historic significance of major Project works is undisputed, and the important role of properties associated with their construction is often clear. But the essential role of properties associated with operation and maintenance of those major works is typically unrecognized. A complex system of dams and canals could not function without the "hands-on" efforts of the men required to operate the equipment to release water through a dam's outlets or generate electricity, set gates to allow water to flow through the main canals, or open and shut turnouts to release water into secondary ditches or farm feeders. A host of men also worked to maintain those Project facilities and equipment in safe and efficient operating condition through routine maintenance. The offices, service yards, housing, as well as other miscellaneous types of properties and equipment not specified here represent these vital operational components of the Project, and help to tell the "whole story" of the Salt River Project. They

are potentially significant for the role they play to enact and maintain the historically important purposes and facilities. They are not likely to be individually eligible properties, but they may contribute to the significance of the principal Project feature with which they are functionally and historically associated.

Registration Requirements

For an ongoing support feature to be nominated under this MPD, it must:

1. Fall within the period of significance for the principal Project feature with which they are functionally and historically associated.
2. Meet one or more of the following criteria. As a contributing property to a historic district it must:
   Criterion A: play a significant role in the O&M of the associated principal Project feature; represent a particular practice of importance at that site or of general importance to system operation; are the site of a significant event associated with Project history; or play an important role in the settlement or agricultural use of the area.
   Criterion B: be associated with the activities or contributions of someone significant in engineering or Reclamation history or in the overall continued successful operation of the Project system.
   Criterion C: be a surviving representative example of a primary type of O&M building or structure, or complex of associated features, representing the O&M functions.
   Criterion D: be the structural ruins or archeological remains of a particular type of O&M property that may yield information important to understanding the operation, activities, and people involved in operating the Project feature or system as a whole. Routine O&M facilities and actions are less extensively documented in agency records, and so archeological information may prove an important data source for these important functions.
   Properties may be individually nominated under this MPD, but because of the nature of the resources under the ongoing support features property type this is likely to be an unusual occurrence.
3. Retain historic integrity. Typically, buildings constructed early in the 20th century will have been altered to bring them to modern standards of comfort and convenience, and had component parts repaired or replaced to address deterioration or changes in fashion (e.g., had porches enclosed, windows replaced, kitchens modernized). Many early 20th century outbuildings will have been repurposed, shops will have been modernized to meet safety requirements, and equipment will have been replaced. These are changes that are to be expected from properties that have been in use. Architectural, stylistic, and/or functional modifications to an O&M structure or complex do not render the property ineligible under this MPD if it retains sufficient characteristics to represent the function and period for which is it being nominated. If the property is being nominated for architectural reasons, it must at a minimum retain its essential exterior characteristics to convey location, design, materials, and workmanship. However, additions or sympathetic modifications do not render the building or

structure ineligible as long as they do not overwhelm the original in terms of scale or substantially alter the aesthetic. For a property being nominated on an architectural basis, it is desirable, but not required, that it retain interior architectural and aesthetic characteristics. If the basis for nomination is not architectural, then more extensive exterior modifications can be acceptable as long as the building still conveys its design and clearly still conveys its Project function for which it is nominated. When period outbuildings and landscape features remain, they should be assessed in conjunction with the principal building. They can contribute to the nomination of the principal building when they have been modified or are deteriorated if they still retain basic exterior characteristics.

G: GEOGRAPHICAL DATA

The geographic limit of the Salt River Project Multiple Property Listing includes the following Arizona County: Maricopa.

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SUMMARY OF IDENTIFICATION AND EVALUATION METHODS

This Salt River Project Multiple Property Document has been developed using readily available published works, unpublished works from SRP and Reclamation archives, various dissertations, and Historic American Engineering Record (HAER) documentation of most project features. See Section I of this submittal for a listing of principal sources used.

The growth of the Phoenix area and the history of the Salt River Project is well-documented by historians of many specialties. They have written about the Project in the context of urban growth, social, political, and cultural change at the local and national scale, environmental change, and history of technology. Historians Karen Smith and Earl Zarbin, both long-time employees of SRP, have published works about the personalities and politics specific to the Project and to the Salt River Project Water Users' Association. Studies by Arizona State University history professors Brad Luckingham and Philip Vandermeer served to place themes associated with local development into broad historic contexts, especially for the post-World War II era. Renowned western economic historian Gerald Nash's studies on World War II and western America are crucial in understanding the region's wartime socioeconomic transformation. On the other end of the temporal spectrum, published archaeological and cultural anthropological studies and other updated materials present recent scholarship on the Hohokam, which helped to situate the project's beginnings in the context of prehistoric irrigation in the Salt River Valley.

Unpublished dissertations also helped, for they tended to closely examine certain aspects of the Project not covered by others. For example, historian David Introcaso's dissertation looked at water storage and hydropower development in central Arizona, and landscape architect Alfred Simon's dissertation analyzed how local uses and social attitudes toward the Project's built landscape changed over time, with assessment also in the context of regional and national historic contexts. Useful unpublished materials in Reclamation and SRP archives included project histories (annual reports prepared by those entities), and annual crop production statistics that illustrate the Project's post-World War II shift from primarily serving the pastoral/agricultural community to increasingly serving a urban/municipal community. Although some gaps exist in this data, they are not sufficient to affect analysis.

Over the past 20 years, Reclamation has completed consultations to assess the historic significance of project dams and elements of the distribution system. HAER documentation has been completed for many project features. These consultation records and HAER documents provided the information needed to document the historical development of the Salt River Project multiple property nomination within an engineering and social context. The HAER documents also provided information on specific dams and conveyance facilities that was used to prepare the property-specific nomination forms that are submitted with this listing.

The primary research to identify sources was completed by Dr. James Bailey, historian, Bureau of Reclamation. Dr. Bailey also completed fieldwork in 2010 to photograph facilities and assess boundaries for nominated features. All facilities were visited except Horseshoe Dam. Dr. Bailey subsequently drafted Section E of the multiple property document and nominations of dams and the

diversion/conveyance system. Lynne MacDonald, Bureau of Reclamation, completed supplemental research, drafted Section F of the multiple property nomination, and edited all sections of the nomination. James Kangas, Bureau of Reclamation, completed supplemental research and edited the five Project dam individual nominations. Mr. Paul Lusignan, National Register Programs, National Park Service, provided guidance and direction to ensure that the materials fulfilled nomination requirements.

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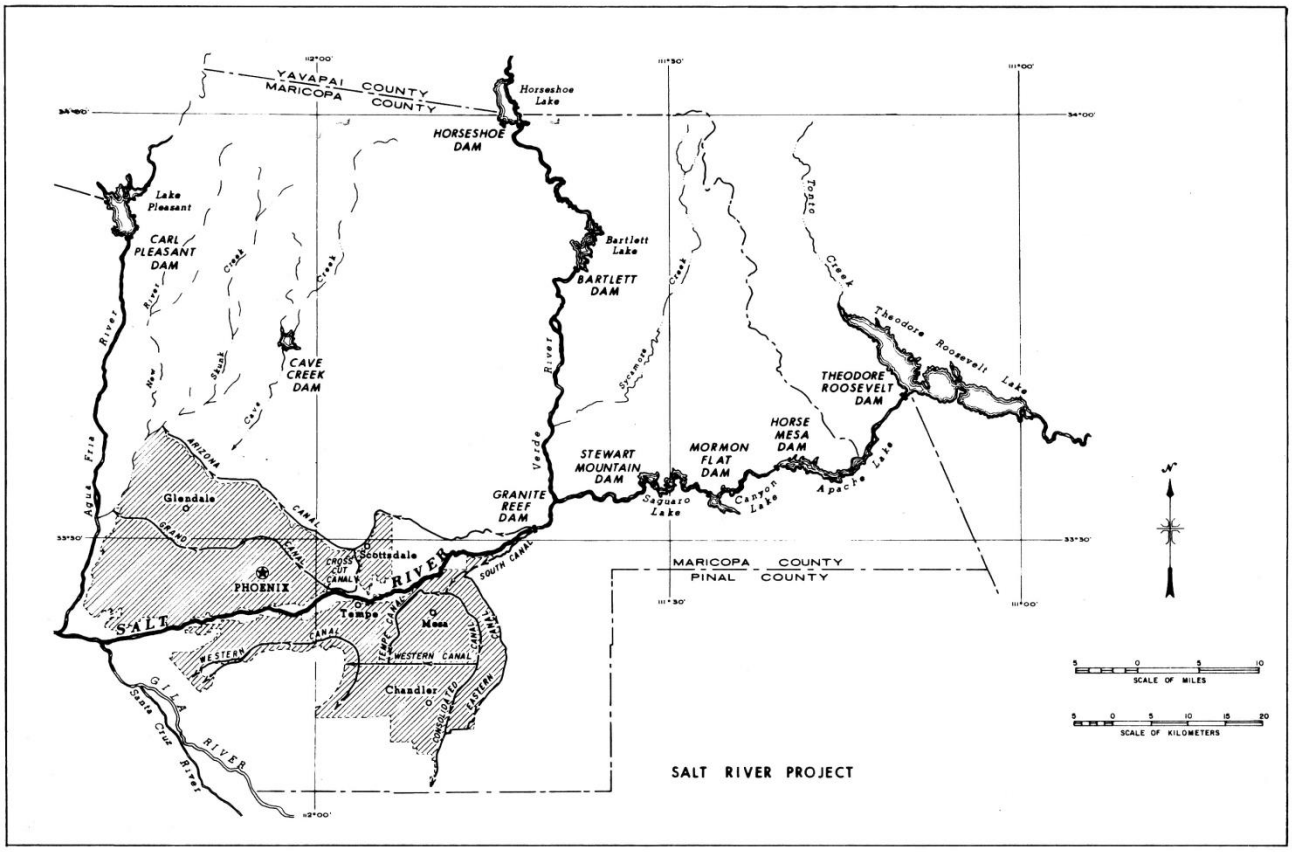
MAPS, PHOTOS, and TABLES

Maps



Salt River Project

Map 1: The Salt River Project, Bureau of Reclamation

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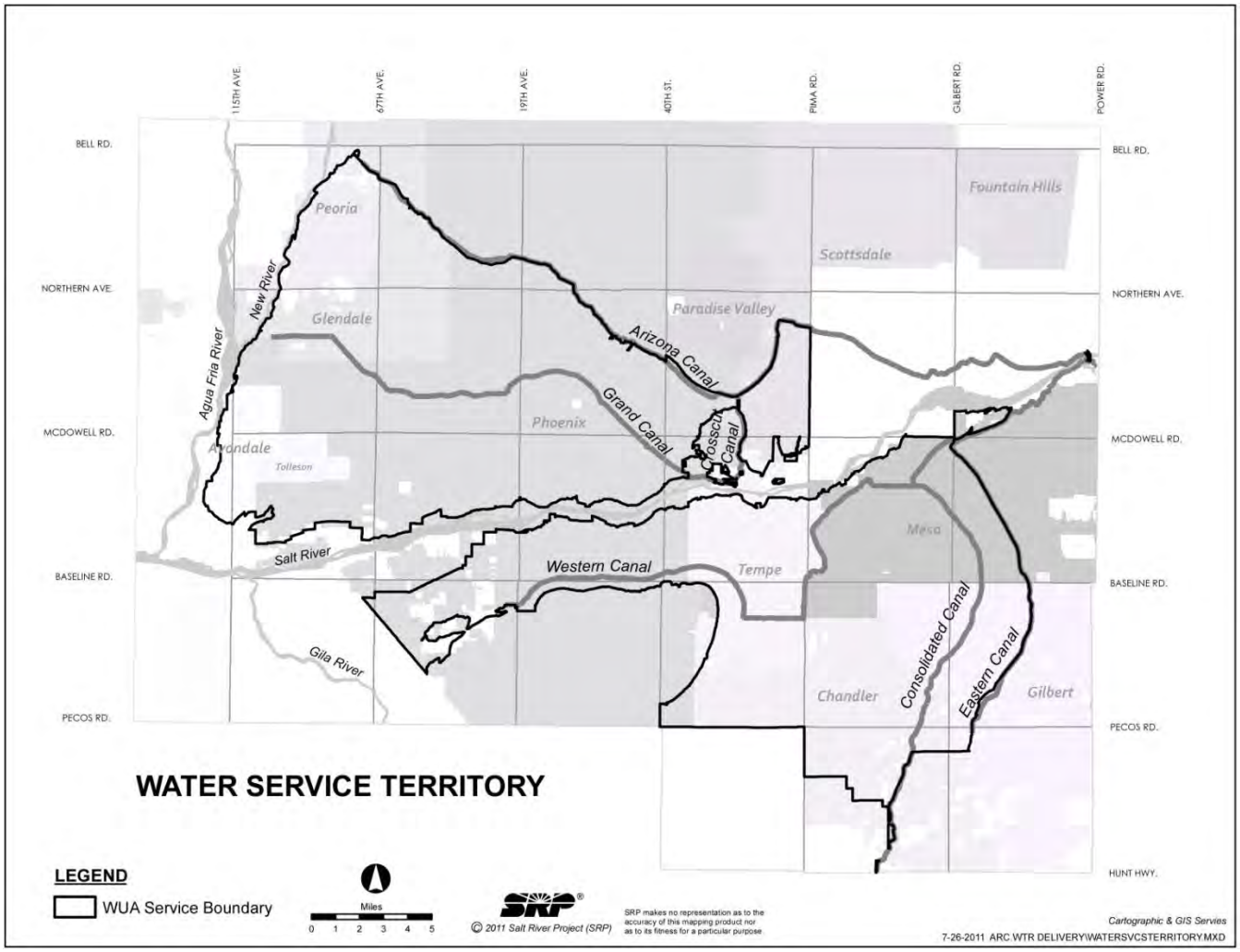

Map 2: Salt River Project Main Canals. Map courtesy of SRP.

Facility Photographs

Photo J1: Theodore Roosevelt Dam, taken before ca. 1988, prior to Safety of Dams modifications in the 1990s. Photo courtesy of the Bureau of Reclamation and the National Park Service, National Historic Landmarks Program

Photo J2: Theodore Roosevelt Dam after Safety of Dams Modifications. Photo courtesy of the Bureau of Reclamation

Photo J3: Mormon Flat Dam, with Canyon Lake (reservoir) in the background.
Photo courtesy of the Bureau of Reclamation, taken 2010, Jim Bailey, photographer

Photo J4: Bartlett Dam on the Verde River, spring 2010. The lighter grey areas atop each of the curved buttresses indicate where the dam was raised 21.5 feet in the 1990s. Photo courtesy of the Bureau of Reclamation, Jim Bailey, photographer

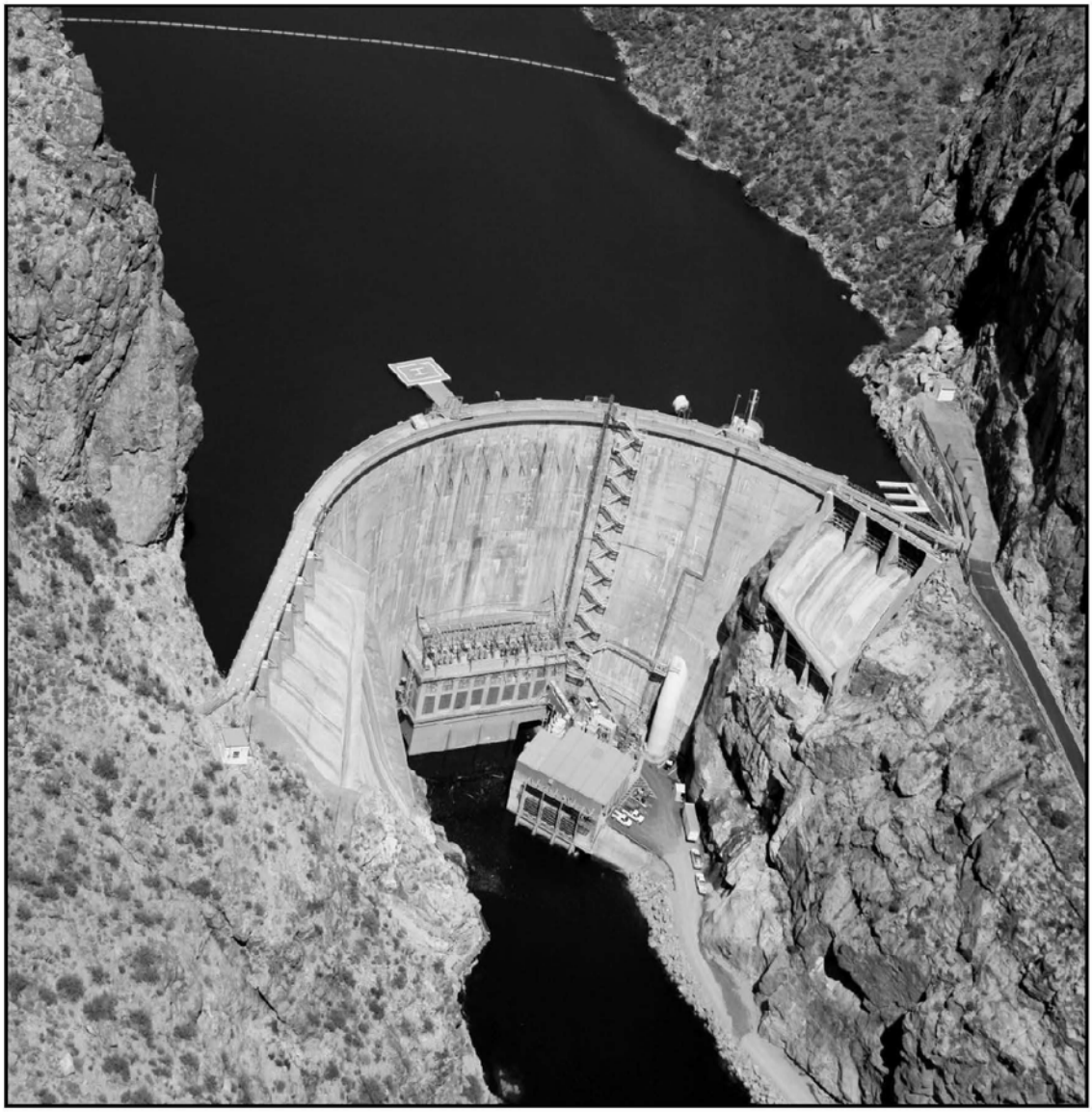

Photo J5: Aerial photo of Horse Mesa Dam, with the powerplant at the downstream toe of the dam, and Apache Lake (reservoir) in the background. Photo courtesy of SRP.

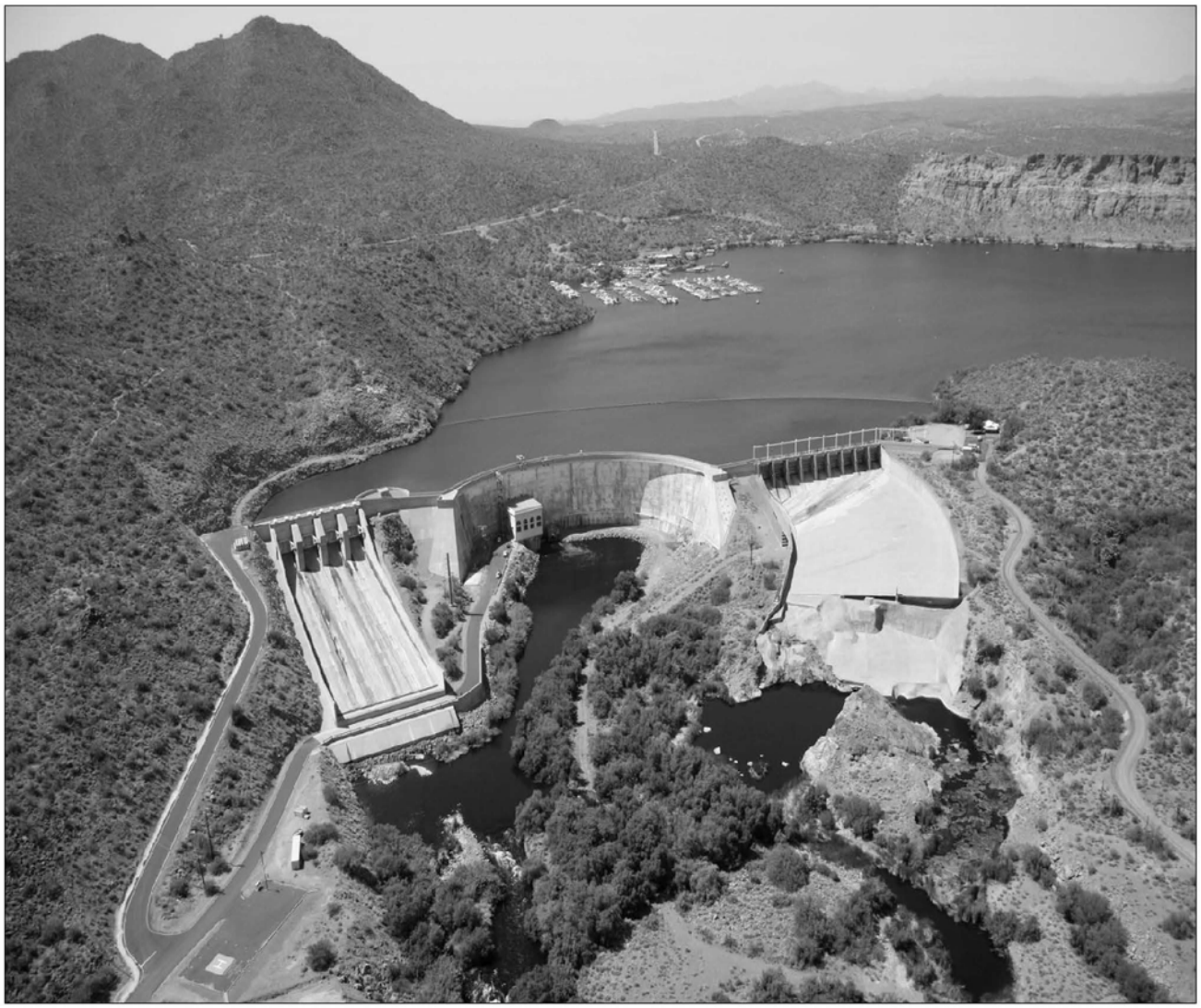

Photo J6: Aerial photo of Stewart Mountain Dam, with the powerplant at the dam's toe, Saguaro Lake (reservoir) in the background. The new spillway on the left (west) of the view is a non-contributing element. Photo taken 2009, provided courtesy of SRP.

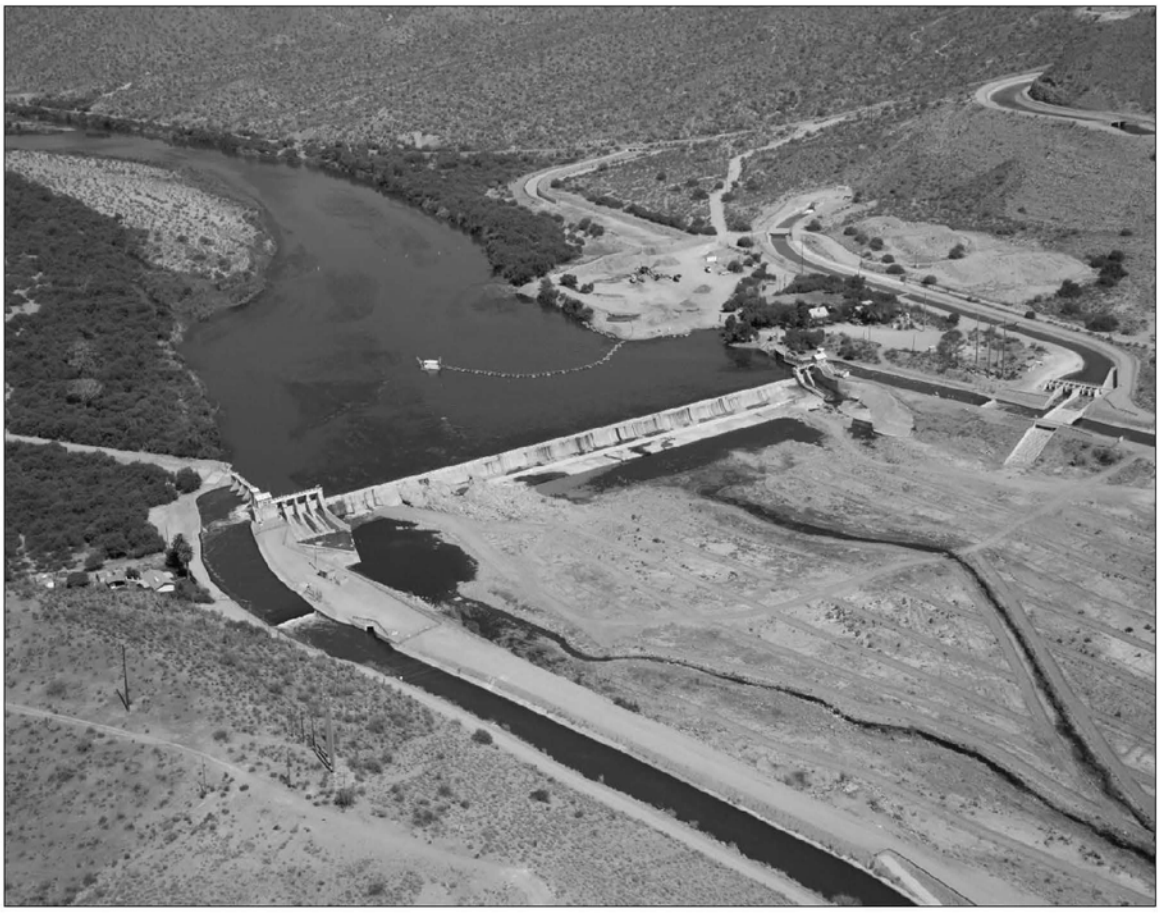

Photo J7: Aerial photo of Granite Reef Diversion Dam. Arizona Canal headworks at center left; South Canal headworks at center right; Southside Gatekeeper's House at center right near South Canal heading. Photo courtesy SRP.

Photo J8: Granite Reef Southside Gatekeeper's House. Photo courtesy of Bureau of Reclamation, Jim Bailey, photographer

Photo J9: Consolidated Canal, near the City of Gilbert. Photo courtesy of the Bureau of Reclamation, Jim Bailey, photographer

Photo J10: Western Canal and check structure, in south Phoenix. Courtesy of the Bureau of Reclamation, Jim Bailey, Photographer

Photo J11: Arizona Canal at Central Avenue, Phoenix. Courtesy of the Bureau of Reclamation, Jim Bailey, Photographer

Photo J12: Stewart Mountain Powerplant and river outlet works. Courtesy of the Bureau of Reclamation, Jim Bailey, Photographer

Photo J13: Crosscut Hydro Plant. Taken 2010, as replacement of windows and doors is occurring. Photo courtesy of the Bureau of Reclamation, Jim Bailey, Photographer

Photo J14: Horse Mesa Dam Powerhouse, with HEFU turbine house to the right. Courtesy of the Bureau of Reclamation, Jim Bailey, photographer.

Tables

Table J1.—The Original Five Reclamation Projects, Authorized March 14, 1903						
Project	**Acres irrigated (actual)**	**Number of storage dams**	**Number of diversion dams**	**Miles of canals and laterals**	**Initial construction period**	**First water Delivery**
Newlands	73,000	2	2	69 canal 312 lat.	1903-1906	February 1906
North Platte	390,000	4	4	337 canal 1,261 lat.	1905-1915	June 1909
Salt River	**238,220**	**7**	**1**	**131 canal 924 lat.**	**1903-1911**	**May 1907**
Milk River	120,816	3	5	200 canal 438 lat.	1906	1911
Uncompahgre	76,297	1	7	128 canal 438 lat.	1904-1912	1908
Source: Bureau of Reclamation Dataweb <http://www.usbr.gov/dataweb/projects/index.html>						

Table J2:				
Salt River Project Storage Dams on the Salt River (all w/ Hydropower Capabilities)				
Facility	**Type**	**Structural Height**	**Crest Length**	**Reservoir and Total Capacity, in acre-feet (a-f)**
Theodore Roosevelt	Thick arch, cyclopean masonry/w concrete overlay	357 feet	723 feet	Roosevelt Lake, 1,653,043 acre-feet
Horse Mesa	Concrete thin arch	305 feet	660 feet	Apache Lake, 245,138 acre-feet
Mormon Flat	Concrete thin arch	224 feet	380 feet	Canyon Lake, 57,852 acre-feet
Stewart Mountain	Concrete thin arch	207 feet	1,260 feet	Saguaro Lake, 69,725 acre-feet
Salt River Project Storage Dams on the Verde River				
Horseshoe	Earth and rock fill	194 feet	1,140 feet	Horseshoe Reservoir, 109,217 acre-feet
Bartlett	Concrete multiple arch	308.5 feet	800 feet	Bartlett Lake, 178, 500 acre-feet
Source: Bureau of Reclamation Dataweb http://www.usbr.gov/dataweb/dams				

Table J3: Salt River Project Diversion-Conveyance System Facilities (contributing only)

Diversion Dam	**Type**	**Structural Height**	**Crest Length**	**Diversion Capacity in cubic feet/second (cfs)**
Granite Reef Diversion Dam	Concrete ogee weir, embankment wings	29 feet	1,128 feet	North side: 2,000 cfs South side: 1,600 cfs

Canal	**Length**	**Diversion Capacity**	**Bottom Width (typical earthen sections)**	**Bottom Width (typical concrete lined sections)**
Arizona	38.5 miles	2,000 cfs	70 feet	50 feet
Grand	22.3 miles	900 cfs	35 feet	28 feet
South	10.1 miles	1,650 cfs		63 feet
Consolidated	18.4 miles	1,325 cfs	40 feet	60 feet
Eastern	14.5 miles	325 cfs		31 feet
Tempe	9.3 miles	600 cfs	45 feet	34 feet
Western	14.4 miles	550 cfs	35 feet	35 feet
Cross Cut	3.5 miles	400 cfs	38 feet	16 feet
Highline laterals	No data available			

Source: US Bureau of Reclamation dataweb, http://www.usbr.gov/dataweb/html/lcsalengdata

Table J4: Population of Phoenix and Neighboring Communities, 1880-1900			
City	**1880**	**1890**	**1900**
Phoenix	1,708	3,152	5,544
Tempe	300	500	900
Mesa	100	400	700
Glendale	_	_	300
Scottsdale	_	_	100
Source: U.S. Census of the Population, 1880-1940.			

Table J5: Population of Phoenix and Neighboring Communities, 1910 to 1940				
City	**1910**	**1920**	**1930**	**1940**
Phoenix	11,134	29,053	48,118	65,414
Tempe	1,154	1,963	2,495	2,906
Mesa	1,700	3,036	3,711	7,224
Glendale	1,000	2,737	3,665	4,855
Scottsdale	300	500	700	1,000
Chandler	-	400	1,378	1,239
Source: U.S. Census of the Population, 1910-40.				

Table J6: Population of the Urban Southwest, 1920 to 1960					
City	**1920**	**1930**	**1940**	**1950**	**1960**
El Paso	77,560	102,420	96,810	130,485	276,687
Phoenix	**29,053**	**48,118**	**65,414**	**106,818**	**439,170**
Tucson	20,292	32,506	35,752	45,954	212,892
Albuquerque	15,157	26,750	35,499	96,815	201,189
Source: U.S. Census of Population, 1920-60.					

Table J7. Population of Phoenix and Neighboring Communities, 1950 to 1980				
City	**1950**	**1960**	**1970**	**1980**
Phoenix	106,618	439,170	584,303	789,704
Tempe	7,684	24,897	65,550	106,743
Mesa	16,670	33,772	63,049	152,453
Glendale	8,179	15,696	36,228	97,172
Scottsdale	2,032	10,026	67,823	86,412
Chandler	3,799	9,531	13,763	29,673
Source: U.S. Census of the Population, 1950-80.				

Table J8: Ten Most Populated Cities of the United States in 1980		
Rank	**City**	**Population**
1	New York City	7,017,639
2	Chicago	3,005,072
3	Los Angeles	2,968,579
4	Philadelphia	1,688,210
5	Houston	1,598,138
6	Detroit	1,203,369
7	Dallas	904,599
8	San Diego	875,538
9	**Phoenix**	**789,704**
10	San Antonio	785,927
Source: U.S. Census of the Population, 1980		

Table J9: The Early Canal Landscape in the Salt River Valley, 1868-1903[1]	
General Context (cultural)	- Opening up Western settlement - Mining communities - Camp (Fort) McDowell - Need for food supply in the region - Beginning of agricultural growth - Phoenix and other towns started - Disputes over water rights - Beginning of land speculation, greed, exploitation
Participants (social/cultural)	- Military - Surveyors - Settlers, both white and Mexican - Farmer-cooperative canal builders - Corporate speculators/canal builders - Courts - Native peoples
Attitudes (social/cultural)	- Canals needed for agricultural survival - Strictly utilitarian view of canals - Entrepreneurial view of canals - Canals as "private cooperatives" - Disregard for canals in emerging urban areas
Use/role of the Canals (social)	- Agricultural irrigation - Some urban use as towns developed in the Salt River Valley
Physical character (landscape)	- Raw looking at first - Development of agricultural lands around newly dug canals - Trees & other vegetation start to sprout along canal rights-of-way - Urban canals degraded and unsanitary - Floods and maintenance problems with headgates

[1] Source for Tables J9, J10 and J11 from Alfred Simon, "Mixing Water and Culture: Making the Canal Landscape in Phoenix." Unpublished Ph.D. Dissertation, Arizona State University, 2002. Tables have been slightly edited for space, not content.

Table J10: The Stabilizing Canal Landscape, 1903-1945	
General Context (cultural)	- Federal intervention in Western development - New Deal reclamation and other public works projects - Realization of need for reliable water supply - Salt River Valley politics—arguments about Federal intervention - Roosevelt (and other) dam(s) built - Growth after unification and improvement of carriage systems - Phoenix develops as economic hub - Agricultural production grows steadily - Highways, roads, rail, and air transportation systems introduced - Mood of optimism - Promotion of the valley as a good place to work and live
Participants (social/cultural)	- Federal presence–Bureau of Reclamation - Salt River Valley Water Users' Association - Farmers and Zanjeros (ditch riders) - Dissenting landowners - Federal courts - Salt River Valley boosters
Attitudes (social/cultural)	- Water conquers the desert - Canals as the valley's lifeblood, better understanding and respect of their roles - Canals key to survival and prosperity - Canal landscape as a social-recreational amenity in the desert - Canals as part of everyday living - Water delivery as a ritual - Urban attitudes: canals interfere with growth
Use/role of the Canals (social)	- Agricultural irrigation - Shade and water for livestock - Urban water supply - Social use as meeting and gathering places - Recreation (swimming, etc.) - Circulation: movement of people and farm machinery - Some resort development - Geographical orientation and way-finding

Physical character (landscape)	- Roosevelt dam allows development of extensive canal and lateral system - Urban and rural "forests" develop along the canal banks - Canal banks cool and inviting environments - Continuous maintenance to promote efficiency - Riparian ecological zone – garden paradise

Table J11: The Post-World War II Canal Landscape	
General Context (cultural)	- General post-war boom and growth in America - Systems approach to rapid urban growth, the standard of efficiency applied to making human environments - Post-war rapid population growth in the Phoenix area - Plentiful jobs in a booming economy - Urban development takes over farmlands - Agriculture remains strong in the Salt River Valley - Manufacturing becomes the leading economic generator - Changing use of water resources with growing urban population - Use of air-conditioning spreading in the residential sector - Private swimming pools become popular
Participants (social/cultural)	- Bureau of Reclamation – owners of the canals - Farmers and Zanjeros (ditch riders) - City of Phoenix – water contracts for new subdivisions - City engineers and planners - County Government – wants parks development along canals
Attitudes (social/cultural)	- Loss of direct connection with the canals in urban development process - New residents know little of the canals - Canals seen as infrastructure in a technological society - Little perception of value in the canal landscape - Urban residents – canals as garbage dumps - Canals perceived as dangerous places - Fear of canals due to accidents and drownings - Liability issues of canals become important
Use/role of the canals (social)	- Agricultural irrigation - Urban water supply - Public use drops off dramatically -1964 agreement for limited public use of canals allows some access

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Salt River Project
Name of Property
Maricopa, AZ
County and State
Salt River Project
Name of multiple listing

Section number J

United States Department of the Interior
National Park Service

Salt River Project
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National Register of Historic Places Continuation Sheet

Section number J

Table J12: Acres Irrigated and Annual Crop Values, 1910-1990 (n/a=data not available)[2]

Year	Acres Irrigated	Crop Value (in dollars)	Year	Acres Irrigated	Crop Value (in dollars)
1910	92,251	n/a	**1951**	238,907	64,928,827
1911	115,042	n/a	**1952**	280,353	60,690,823
1912	128,628	n/a	**1953**	313,307	57,501,277
1913	163,312	4,552,879	**1954**	200,416	56,639,818
1914	187,112	4,039,079	**1955**	200,201	51,429,725
1915	192,000	3,661,769	**1956**	192,578	55,337,315
1916	187,905	8,435,719	**1957**	187,962	54,965,816
1917	201,600	13,692,000	**1958**	183,610	52,145,374
1918	205,616	18,188,800	**1959**	155,252	48,886,127
1919	205,064	23,768,682	**1960**	175,477	49,133,697
1920	205,060	18,551,800	**1961**	171,244	48,290,985
1921	202,439	11,435,384	**1962**	165,428	48,966,894
1922	204,590	15,497,141	**1963**	160,090	53,630,174
1923	204,589	18,293,187	**1964**	158,081	53,273,342
1924	233,494	21,964,962	**1965**	155,363	51,364,674
1925	n/a	n/a	**1966**	199,187	58,810,647
1926	239,852	16,549,161	**1967**	209,885	67,631,326
1927	243,440	21,188,747	**1968**	135,742	47,382,067
1928	245,938	26,082,055	**1969**	136,701	45,974,249
1929	245,659	25,423,030	**1970**	132,289	46,261,580
1930	n/a	n/a	**1971**	129,074	49,881,659
1931	245,897	10,355,048	**1972**	124,398	60,492,592
1932	245,658	9,660,555	**1973**	120,136	90,096,493
1933	245,648	12,393,212	**1974**	116,848	95,324,128
1934	245,748	16,514,901	**1975**	111,105	86,596,868
1935	246,483	18,638,893	**1976**	112,525	108,196,530
1936	n/a	19,487,951	**1977**	126,606	91,851,836
1937	n/a	20,150,858	**1978**	n/a	n/a
1938	246,473	18,460,319	**1979**	113,513	120,349,169
1939	n/a	n/a	**1980**	111,080	134,048,042
1940	242,836	16,843,965	**1981**	107,526	120,516,433
1941	243,196	19,190,552	**1982**	n/a	n/a
1942	242,372	29,195,456	**1983**	82,692	103,455,428
1943	243,125	35,482,345	**1984**	90,194	111,696,162
1944	243,125	36,640,419	**1985**	76,516	99,676,930
1945	243,125	33,034,154	**1986**	64,404	82,225,212
1946	229,293	41,043,385	**1987**	60,489	90,087,219
1947	228,514	31,763,505	**1988**	63,973	81,519,208
1948	225,307	32,894,839	**1989**	63,469	80,162,127
1949	225,154	32,872,501	**1990**	65,160	81,301,685
1950	239,802	36,999,324			

[2] U.S. Reclamation Service *Annual Reports* (1910-1921); Salt River Project Water User's Association Histories (1922-1952); *Salt River Project Annual Reports* (1953-1965); Reclamation Water and Land Accomplishments, Crop Production Reports (1966-1990

National Register of Historic Places
Memo to File

Correspondence

The Correspondence consists of communications from (and possibly to) the nominating authority, notes from the staff of the National Register of Historic Places, and/or other material the National Register of Historic Places received associated with the property.
Correspondence may also include information from other sources, drafts of the nomination, letters of support or objection, memorandums, and ephemera which document the efforts to recognize the property.

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

Requested Action: COVER DOCUMENTATION

Multiple Name: Salt River Project MPS

State & County: ARIZONA, Maricopa

Date Received: 6/23/2017 Date of 45th Day: 8/7/2017

Reference number: MC100001405

Reason For Review:

__ Appeal
__ SHPO Request
__ Waiver
__ Resubmission
__ Other
__ PDIL
__ Landscape
__ National
__ Mobile Resource
__ TCP
__ CLG
__ Text/Data Issue
__ Photo
__ Map/Boundary
__ Period
__ Less than 50 years

__X__ Accept _____ Return _____ Reject __8/7/2017__ Date

Abstract/Summary Comments: The Salt River Project MPS cover documentation provides an excellent contextual history of the development of the Bureau of Reclamation's Salt River Project in Arizona. Solid Registration Requirements are established for several property types, including the comprehensive system of water delivery canals as an integrated district. Accept Cover Documentation.

Recommendation/ Criteria: Accept MPS Cover Documentation

Reviewer Paul Lusignan Discipline Historian

Telephone (202)354-2229 Date 8/7/2017

DOCUMENTATION: see attached comments: No see attached SLR: No

If a nomination is returned to the nomination authority, the nomination is no longer under consideration by the National Park Service.

SALT RIVER PROJECT MPS
Maricopa County, AZ

National Register of Historic Places-Preliminary Review Comments:

Overall, the draft MPS documentation provides an excellent contextual history of the development of the Bureau of Reclamation's Salt River Project in Arizona.

MPS Cover Document.

Section E-Historic Context
The beginning introductory statement of Section E provides an excellent overview of the themes and history of the Salt River Project.

The discussion of the earlier/ancient Hohokam irrigation system (pages 12-15) is much too lengthy and detailed. While the narrative provides interesting context for the later SRP efforts, there are really no physical components of the ancient Hohokam system in place or being nominated under this MPS. Therefore the contextual information should be revised and reduced in length to provide a quick overview, unless there is a belief that future property types might be developed for archeological canal features under this MPS cover. The materials, at this length, are too distracting from the necessary focus of the Bureau of Reclamation SRP MPS.

The discussion of Hohokam Canals within Section E has been reduced to provide only a basic historical background.

The remaining narrative in Section E does an excellent job of outlining the background behind the development of the SRP and provides a solid basis for recognizing the project's historic, twentieth century significance. The background narrative could have provided a bit more insight into the inner workings of the SRP system, including how the specific designs were developed, contracting logistics, role of central office design/review staff versus local designers, development of worker populations and surrounding city development. [*In reviewing the entire nomination packet, much of this type of information appears to be provided in the individual nomination forms. Unfortunately, many of those narratives are redundant and this approach leads to overly detailed and sometimes tedious historic discussions. Incorporation into the MPS cover document, one time, would greatly streamline the individual nomination forms.*]

The redundancy between Section E and the individual nomination forms was intentional. Jim Bailey felt that the general reader would focus on a specific dam or canal and not read the entire MPS. The history of each property was designed to stand alone, which resulted in some redundancy. We prefer to keep this redundancy in Section E.

Section F-Property Types
The significance section under Criterion C notes that properties may be eligible for listing as *representative examples* of an important property type if they possess the "distinctive

characteristics," the common features or traits of that type, period, or method of construction. The individual property type descriptions, however, provide very little information on what those "distinctive characteristics" may be. The MPS cover document should provide at least a brief outline of those common component pieces that make up a dam site, a canal system, or any other property type. What are the constituent parts of a storage-regulation dam—water retention dam, spillways, regulating gates, power plant, water outfall/release system, wingwalls, control houses, caretaker's quarters, reservoirs, penstocks, downriver aprons, access points, etc.? What construction materials are most likely to be found in use for these properties? Off the shelf designs or custom works fitted to the location?

Section F was modified to include descriptions for each property type.

The discussion of these above elements here in the cover document then leads to an expectation that they will be identified and noted in the individual nominations, described to some degree, and their integrity evaluated.

PXAO prefers to cite only Criterion A for all the individual nominations (except Bartlett) it is currently submitting under this MPS.

All of the Significance statements should also recommend the likely Areas of Significance under which the nominated resources will be listed (Agriculture, Engineering, Politics/Government, etc.) Additional guidance should also be provided on how the most appropriate period of significance should be selected based on the Criterion chosen and the particular historic contexts.

Within Section F, significance statements for each property type were revised to identify likely areas of significance.

There still needs to be a larger discussion on the appropriate beginning and end dates and how they are selected. The beginning dates, it should be remembered, should not predate the extant resources. Even if certain properties carry on an irrigation tradition started in earlier times, the period of significance should reflect the current physical resources. The end dates for the periods should not necessarily terminate at the completion of initial construction, unless the properties are only listed under Criterion C-Engineering. Under Criterion A it may be necessary to 1) account for significant major changes that resulted in the current physical manifestation of the property and 2) fully acknowledge the operational importance of the property to the larger SRP efforts.

Date ranges discussed within Sections E and F have been reviewed and the descriptions expanded.

Storage Dams. See above.
If we know all of the potential candidates under this property type there may be ways of integrating more specific information into the narrative, particularly as it may reflect the particular variations within the type.

Specific details regarding each dam are provided within the individual nomination forms.

Diversion-Conveyance Systems. See above.
There should be a brief statement clarifying up front that this property type (for purposes of this MPS) is being considered as a single linear district and not a series of individual listings. It may even be worthwhile to have this conversation in the introductory statement of the entire Property Type section, where it can be outlined that given the physical character of the SRP system—a series of widely spaced out dams and reservoirs built to provide a regulated supply of water to a interconnected system of canals—the dams will be evaluated individually and the canal as part of a continuous, linked district.

A statement to this effect was added to the end of the introductory description section of Property Type II.

Once again, the description section does not provide much of an outline of what constitutes the defining physical characteristics of this property type. Diversion dams will consist of……., canals will consist of…… using these materials….. End points will be determined by……

Specific details regarding the diversion dam and general descriptions of the canals and their construction materials, as well as drains and appurtenant features are present in the description for each subtype within Property Type II.

What are the most appropriate areas of significance?

This is discussed in the significance paragraph within Property Type II. The most appropriate area of significance is the development and growth of the Salt River Valley. This resulted from the development of an integrated system of storage dams and distribution canals that allowed agriculture to thrive and eventually lead to the transformation of the Valley into the sixth largest urban area in the United States. This is stressed within the MPS and the individual nomination forms. General areas of significance include agriculture, politics/government, and settlement.

The discussion of integrity normally goes under registration requirements not significance.

This discussion was moved to registration requirements.

See discussion above regarding appropriate Periods of Significance. Particularly with the canal system, ending the period at the point of initial completion fails to recognize the significant later alterations, the current integrity of the resources, and their continuing use and significance within the Salt River valley. No extant resources appear to reflect pre-SRP materials, design, or engineering, so a start date prior to SRP involvement should also be carefully reviewed or better documented.

This was revised to include subsequent modifications made by SRP, Reclamation, and the CCC.

In discussing the Laterals it should be clear that there is a difference between being considered "non-contributing" and simply not being included is this nomination project. The laterals may well be significant, eligible features, but for purposes of this nomination they are not being

evaluated and are not being considered as physical components of the system. The main conveyance canals are able to convey important themes despite the fact that not all of the constituent pieces of an irrigation "system" are being evaluated and nominated at this time.

This was revised and footnotes added to clarify that laterals and drains could potentially be eligible and contribute to a historic district, but will not be included under this MPS.

The term "Drain" is first mentioned on page 44, but there is really no further discussion of the property type. Where do they fit into the property type discussion outlined on pages 42-43? The discussion on page 44 says Class 1 Drains are contributing, but the last line says drains are not evaluated. Which is it?

Drains are now described as Property Subtype D within Property Type II.

Power Plants. There should be a separate heading for Significance to remain consistent with the other property type discussions.

A heading for significance was added.

The description should outline the typical "character defining" physical characteristics of the property type. The fact that they are a property type best evaluated as part of a larger resource should be noted. Areas and Periods of Significance should be outlined.

This section was expanded to address this issue.

Auxiliary Construction Works. Is it intended that these properties would be evaluated for individual listing in the National Register or more likely as contributing elements to a larger property? Would it make a difference in evaluating integrity? For many of these resources it would seem that Criterion D would have a more prominent role. If this is the case it should be so noted and any specific guidance conveyed.

This section was expanded and guidance for eligibility under Criterion D was provided.

[*On the whole the revisions you detail in your March 2012 comments respond to a great many of the issues outlined above. The revised description sections in particular provide a much more solid discussion of the physical character to be found at the nominated sites. The significance sections also do a much better job of outlining the respective areas of significance and periods, although we can still have a discussion over the most appropriate period of significance. The efforts at justifying the significance of the respective property types might be a bit more than necessary, as the Section E context does a fairly good job of doing this along with the introductory materials and the individual nominations. If we were developing an MPS for as yet unidentified resources, these revisions would be extremely useful, but with a fixed number of known sites, they largely make their own case for eligibility. Nothing in the revised narratives appears incorrect, but it may be simpler to establish the* ***general*** *significance of all the sites/property types once in an introductory statement and then reserve the individual statements to the unique qualities of the particular property types.*]

General statements on significance are provided for each property type, while the significance of each property is addressed in the individual nomination forms.

Individual Nominations

A number of the suggested revisions on the individual nomination forms are applicable to all of the nominated properties. For clarity they will be repeated within each comment narrative.

PXAO used the basic information you identified under Section 7 below to better describe the features. PXAO made the changes in Section 2 you indicated and will ensure the FPO and SHPO signatures are on all nomination forms for the final submission. PXAO added Government/Public Works to Section 6. PXAO will only check Criterion A in Section 8 as this was the primary focus of the significance of the system and PXAO prefers not to nominate any of the properties under Criterion C. PXAO used the recommended dates and created new maps for each nomination with aerial backgrounds rather than USGS quads.

Mormon Flat Dam

Section 2. Location. Move the current text from the "city" line to the "street address" line, and on the "city" line place "Phoenix." Make sure the "vicinity" box is checked. For properties located in rural areas, the vicinity location is normally a major community visible on a local map. If no other community makes sense for these resources, use Phoenix. Done.

Section 3. Certification. All nominations will need to include both the Federal Preservation Officer's signature as well as the SHPO's signature. Please remember to note the agency's recommended level of significance and justify that selection in the nomination narrative. Will do this for final.

Section 6. Historic/Current Function. Add: *Government/Public Works* Done.

Section 7. Description. Under *Architectural Classification* add: *Other/concrete thin arch dam* Done.

The current narrative description for this property is fairly limited. A number of major components have no mention or description at all. Among the elements that probably could/should receive some note are:

- The right (northern) abutment = bedrock cliff.
- The downriver elevation of the dam features a smooth concrete surface, and is topped by a service walkway detailed with a simple, continuous concrete balustrade.
- The 1938 concrete gatehouse superstructure rises (soars) ____' above the top of the dam with large openings for the raised gates. The gatehouse's working areas are lit by a series of 10 regularly-spaced window openings (2 sets of 5 above each gate), while the remaining surfaces are devoid of any stylistic detailing except for shallow recessed panels on the end walls. A working bridge crosses the spillway span above the lowered gates at the level of the top of the dam.
- Portions of the original spillway apron are visible at the dam's left (southern) abutment adjacent to the newer spillway.
- At the base of the dam a small (metal?) penstock serves the small classically detailed, concrete powerhouse, which is square in plan with a modern replacement gabled roof. The wall surfaces feature large multi-paned arched windows on the north elevation with segmental arch vents(?) at the roofline and a large roll-up door facing downstream.
- A larger metal/concrete penstock feeds into the 1971 unit with exit gates on the downriver wall. (Unclear)

- The upriver face of the dam contains a small, multi-gate intake structure (date unclear).

PXAO used the basic information you identified here to better describe the features.

Section 8. Significance. The current narrative does an excellent job of outlining the basis for the National Register significance of the resource and provides a detailed history of the specific development of this site. While the background narrative need not have been so extensive or detailed—it should be a synopsis--since it is already written I would retain the materials as is. Retained.

The nomination form only checks National Register Criterion A, but the areas of significance include Engineering and the narrative clearly notes the resource as a good example of a type and method of dam construction, justifying eligibility under Criterion C. Recommend checking *Criterion A and C.* PXAO prefers not to nominate this property under Criterion C.

The *Period of Significance* should be combined into a single period reflecting the facility's continued operation and significant role as part of the larger Salt River Project. If Criterion C alone were being selected than a period highlighting the various construction episodes would make sense, but with Criterion A, a longer continuous era is more appropriate. Recommend: *1923-1939*. Done.

The *Significant Dates* should be revised to delete *1903* (SRP authorization date). All significant dates must be within the identified Period of Significance and must be directly tied to extant resources. Done.

Maps. Is providing a more detailed map for these sites going to be a problem? How about using Google Earth? With such complicated resources a good quality map, even at the schematic level, is very useful in documenting the actual boundaries of the site. The current USGS map segments are less than clear for this purpose.

PXAO developed new maps using aerial imagery as the background. The USGS quadrangle is still cited in the boundary justification as a reference.

<u>Stewart Mountain Dam</u>

Section 2. Location. Move the current text from the "city" line to the "street address" line, and on the "city" line place "Phoenix." Make sure the "vicinity" box is checked. For properties located in rural areas, the vicinity location is normally a major community visible on a local map. If no other community makes sense for these resources, use Phoenix. Done.

Section 3. Certification. All nominations will need to include both the Federal Preservation Officer's signature as well as the SHPO's signature. Please remember to note the agency's recommended level of significance and justify that selection in the nomination narrative. Will do this for final.

Section 5. Resource Count. "Buildings" appears twice in the Resource Count box, which is a bit confusing and doesn't reflect the standard NR form. Done.

Section 6. Historic/Current Function. Add: *Government/Public Works* Done.

Section 7. Description. Under *Architectural Classification* add: *Other/concrete thin-arch dam.* Done.

The current narrative description for this property is fairly limited, although it is better than the Mormon Flat description. Among the elements that probably could/should receive some note are:

- The use of "right" and "left" to describe the location of dam components is confusing because it

is dependent on your perspective. In the case of the Stewart Dam site for instance, the photos are taken from one perspective, while the left and right designations in the text are taken from the opposite perspective. It is more appropriate to use cardinal directions (north, south, east, west) than left and right, or in the best scenario use both. "The right (west) spillway…."

- The powerhouse access roadway at the base of the dam runs beneath the west spillway.
- The original concrete balustrade atop the dam and spillway were replaced with a new concrete parapet wall using the original cantilevered/overhanging base.
- The original concrete powerhouse is a small, square building with a flat roof, an undecorated cornice, and a series of arched windows on the downriver (south) and eastern facades. A modern steel stair runs from the base of the dam near the powerhouse to the top of the dam parapet.
- Do we know what was originally in place of the new spillway? A short gravity section?

PXAO used the basic information you identified here to better describe the features.

Section 8. Significance. The current narrative does an excellent job of outlining the basis for the National Register significance of the resource and provides a detailed history of the specific development of this site. While the background narrative need not have been so extensive or detailed—it should be a synopsis--since it is already written I would retain the materials as is. Retained.

The nomination form only checks National Register Criterion A, but the areas of significance include Engineering and the narrative clearly notes the resource as a good example of a type and method of dam construction, justifying eligibility under Criterion C. Recommend checking *Criterion A and C*. PXAO prefers not to nominate this property under Criterion C.

The *Period of Significance* currently ends with the completion of the initial stage of dam construction, completely dismissing the facility's continued operation and significant role as part of the larger Salt River Project. If Criterion C alone were being selected a period highlighting the initial construction episode would make sense, but with Criterion A, a longer continuous era is more appropriate. At a minimum, the period should be taken up to 1936 to include the lining of the spillway. Recommend: *1928-1936*. Done.

The *Significant Dates* should be revised to delete *1903* (SRP authorization date) and 1988 (new spillway). All significant dates must be within the identified Period of Significance and must be directly tied to extant contributing resources. Done.

Verbal Boundary Description/Maps. Is there a problem with providing a more detailed map for the project? How about using Google Earth? With such complicated resources a good quality map, even at the schematic level, is very useful in documenting the actual boundaries of the site. The current USGS map segments are less than clear for this purpose.

PXAO developed new maps using aerial imagery as the background. The USGS quadrangle is still cited in the boundary justification as a reference.

Is the modern spillway included in the boundaries or not? The verbal boundary description says it includes the dam, spillway, and powerhouse ***only***, but the resource count and narrative description seem to imply the newer spillway is also in the boundary. As an integral component of the site and structural feature of the property, the modern spillway should be included in the nomination. See below for scenarios where a clearly detached modern spillway component is more readily excluded. The map accompanying the nomination is not clear on this matter, which seems to support the necessity of a better detailed map. Clarified that new spillway is non-contributing, although it is included in the boundary

because it is part of the dam.

Horse Mesa Dam

Section 2. Location. Move the current text from the "city" line to the "street address" line, and on the "city" line place "Phoenix." Make sure the "vicinity" box is checked. For properties located in rural areas, the vicinity location is normally a major community visible on a local map. If no other community makes sense for these resources, use Phoenix. Done.

Section 3. Certification. All nominations will need to include both the Federal Preservation Officer's signature as well as the SHPO's signature. Please remember to note the agency's recommended level of significance and justify that selection in the nomination narrative. Will do this for final.

Section 6. Historic/Current Function. Add: *Government/Public Works* Done.

Section 7. Description. Under *Architectural Classification* add: *Other/concrete thin-arch dam.* Done.

The current narrative description for this property is fairly limited. A number of major components have no mention or description at all. Among the elements that probably could/should receive some note are:

- The small building atop the northern bluff, likely associated with the tunnel (regulating gatehouse/generator house). The building/structure is small, concrete and square in plan, with a flat roof, and devoid of detailing except for a projecting cornice and foundation. It is reached by a narrow footbridge. Function unclear.
- The spillway discharge tunnel operating house mentioned in the text as embedded in the rock wall above the north abutment is not described at all.
- The spillway tunnel is not described in any detail, nor is its highly visible concrete exit portal, which is inscribed with the date 1937.
- What is the small sheltered doorway to the north of the dam immediately under the north spillway? Entry door to the tunnel? Dam? Reached by a metal footbridge.
- The dam is topped by a service walkway detailed with a simple, continuous concrete balustrade.
- The Powerhouse (dimensions?) features nine bays with tall arched window openings filled with industrial (metal?) glass. Despite the building's monolithic concrete exterior, the pilasters framing the window bays and the heavy rooftop cornice impart a classical feel to the building. A tall metal scissor staircase is located adjacent to the powerhouse, reaching from the base of the dam wall to the crown.
- The building south of the powerhouse (HEFU) is not described or noted along with its intake tower on the upside of the dam. Is it attached and considered a part of the historic powerhouse or is it a separate building with separate intake, penstock, and outfall? What is the date? It is discussed at some length at the end of section 8 and that may be worth moving to section 7. If it is a separate facility it should be counted separately in the Resource Count.

PXAO used the basic information you identified here to better describe the features, however, more detail is provided in Section 8.

Section 8. Significance. The current narrative does an excellent job of outlining the basis for the National Register significance of the resource and provides a detailed history of the specific development of this site. While the background narrative need not have been so extensive or detailed—it should be a synopsis--since it is already written I would retain the materials as is. Retained.

The nomination form only checks National Register Criterion A, but the areas of significance include Engineering and the narrative clearly notes the resource as a good example of a type and method of dam

construction, justifying eligibility under Criterion C. Recommend checking *Criterion A and C*. PXAO prefers not to nominate this property under Criterion C.

The *Period of Significance* currently ends with the completion of the initial stage of dam construction, completely dismissing the facility's continued operation and significant role as part of the larger Salt River Project. If Criterion C alone were being selected than a period highlighting the initial construction episode would make sense, but with Criterion A, a longer continuous era is more appropriate. At a minimum, the period should be taken up to 1937 to incorporate the 1930s alterations. Recommend: *1924-1937*. Done.

The *Significant Dates* should be revised to delete *1903* (SRP authorization date). All significant dates must be within the identified Period of Significance and must be directly tied to extant contributing resources. Done.

Verbal Boundary Description/Maps. Is there a problem with providing a more detailed map for the project? How about using Google Earth? With such complicated resources a good quality map, even at the schematic level, is very useful in documenting the actual boundaries of the site. The current USGS map segments are less than clear for this purpose. The current USGS map does not appear to incorporate the north spillway tunnel, but this may be an issue of scale.

PXAO developed new maps using aerial imagery as the background. The USGS quadrangle is still cited in the boundary justification as a reference.

Horseshoe Dam

Section 2. Location. Move the current text from the "city" line to the "street address" line, and on the "city" line place "Phoenix." Make sure the "vicinity" box is checked. For properties located in rural areas, the vicinity location is normally a major community visible on a local map. If no other community makes sense for these resources, use Phoenix. Done.

Section 3. Certification. All nominations will need to include both the Federal Preservation Officer's signature as well as the SHPO's signature. Please remember to note the agency's recommended level of significance and justify that selection in the nomination narrative. Will do this for final.

Section 5. Resource Count. "Buildings" appears twice in the Resource Count box, which is a bit confusing and doesn't reflect the standard NR form. Done.

Section 6. Historic/Current Function. Add: *Government/Public Works* Done.

Section 7. Description. Under *Architectural Classification* add: *Other/earth-fill dam.* Done.

The current narrative description for this property is fairly limited. A number of major components have no mention or description at all. Among the elements that probably could/should receive some note are:

- Clarify in the narrative that the separate 1990 auxiliary spillway is not within the bounds of the nominated property and thus not listed in the Resource Count.
- Reinforce the notion that the 1990 alterations to the dam, while substantial, do not materially impact the ability of the resource to convey its significant historic character in both materials and overall construction design.
- An access roadway crosses the downstream face of the dam and runs across the lower lip of the spillway apron with a separate walkway underneath the spillway (from 8.6).

PXAO used the basic information you identified here to better describe the features.

Section 8. Significance. The current narrative does an excellent job of outlining the basis for the National Register significance of the resource and provides a detailed history of the specific development of this site. The current narrative should not direct readers to a separate NR listing for supporting documentation, as each form should stand alone, except for materials addressed in the MPS cover document. As noted elsewhere, however, the background narrative need not be so extensive or detailed—it should be a synopsis. In this case, the documentation contained in the current nomination form is sufficient to justify listing, so the reference to the other nomination can stay as it simply provides additional background information not required for listing. Retained.

The *Significant Dates* should be revised to delete *1903* (SRP authorization date) and 1990 (PMF modification). All significant dates must be within the identified Period of Significance and must be directly tied to extant contributing resources. Done.

Verbal Boundary Description/Maps. Is there a problem with providing a more detailed map for the project? How about using Google Earth? With such complicated resources a good quality map, even at the schematic level, is very useful in documenting the actual boundaries of the site. The current USGS map segments are less than clear for this purpose.

PXAO developed new maps using aerial imagery as the background. The USGS quadrangle is still cited in the boundary justification as a reference.

The verbal boundary description should not confuse non-contributing and not included. "The newer spillway is non-contributing *and because of its physical separation from the historic components it is excluded from the nominated property*." Done.

Bartlett Dam

Section 2. Location. Move the current text from the "city" line to the "street address" line, and on the "city" line place "Phoenix." Make sure the "vicinity" box is checked. For properties located in rural areas, the vicinity location is normally a major community visible on a local map. If no other community makes sense for these resources, use Phoenix. Done.

Section 3. Certification. All nominations will need to include both the Federal Preservation Officer's signature as well as the SHPO's signature. Please remember to note the agency's recommended level of significance and justify that selection in the nomination narrative. Will do this for final.

Section 5. Resource Count. "Buildings" appears twice in the Resource Count box, which is a bit confusing and doesn't reflect the standard NR form. Done.

Section 6. Historic/Current Function. Add: *Government/Public Works* Done.

Section 7. Description. Under *Architectural Classification* add: *Other/multi-arch hollow buttress dam.* Done.

The current narrative description for this property is fairly limited. A number of major components have no mention or description at all. Among the elements that probably could/should receive some note are:

- The river outlet valve housing is found in an unadorned square concrete box with industrial sash near the southern dam abutment.
- The 1996 modifications to the crest of the dam and spillway are visible as a change in concrete

coloring, but do not materially affect the physical integrity of the dam's unique multi-arch design.
- The large superstructure of the spillway control house lacks any architectural detailing except for regularly spaced industrial windows at the top east and west elevations and along the vertical end towers.

PXAO used the basic information you identified here to better describe the features.

Section 8. Significance. The current narrative does an excellent job of outlining the basis for the National Register significance of the resource and provides a detailed history of the specific development of this site. The *Significant Dates* should be revised to delete *1903* (SRP authorization date) and *1994-96* (modification). All significant dates must be within the identified Period of Significance and must be directly tied to extant contributing resources. Done.

Verbal Boundary Description/Maps. Is there a problem with providing a more detailed map for the project? How about using Google Earth? With such complicated resources a good quality map, even at the schematic level, is very useful in documenting the actual boundaries of the site. The current USGS map segments are less than clear for this purpose.

PXAO developed new maps using aerial imagery as the background. The USGS quadrangle is still cited in the boundary justification as a reference.

The verbal boundary description does an excellent job of discussing the non-contributing and not included modern spillway. (Use similar wording for the Horseshoe Dam.) Done.

Salt River Project Diversion and Conveyance System Historic District

Section 2. Location. Recreate a line for Street/Address and place "Greater Phoenix metropolitan region" there and move list of cities to the City/town line. Make sure the "vicinity" box is checked. Done.

Section 3. Certification. All nominations will need to include both the Federal Preservation Officer's signature as well as the SHPO's signature. Please remember to note the agency's recommended level of significance and justify that selection in the nomination narrative. Will do this for final.

Section 5. Resource Count. The introductory descriptive narrative speaks of a Southside Gatekeeper's House at the dam, but the resource is not counted in the list. If it exists as a separate building, it should be so counted in the nomination (and described), and not simply lumped into the dam structure. Done.

Section 6. Historic/Current Function. Add: *Industry/Processing – Water Works* Done.

Section 7. Description. Under *Architectural Classification* add: *Other/concrete ogee weir dam.* Done.

It is not completely clear why the San Francisco Canal and the Old Crosscut Canal are included in the nomination. If the resources lack physical integrity from the period of significance might they be excluded from the nomination? Or are they so intertwined in the linear composition of the canal system that they need to be included as non-contributing resources?

Descriptions of these canals have been removed and they are mentioned only in the context section when applicable.

Are the Zanjero Ditchrider houses included in the bounds of the nomination or not? If they are in the district or directly attendant to the physical canal system they can't simply be "unevaluated." If they

retain even a modest amount of integrity they contribute to the larger historic district/canal system. If they are separated from the canal proper and the Bureau of Reclamation would prefer to leave them out than that needs to be clearly stated in the narrative.

They are not included within the bounds of the nomination.

The current narrative descriptions for these resources are fairly limited. While, as contributing components of a district, the narrative statements need not be exhaustively detailed, the descriptions should provide a minimal discussion of the major features and elements of the resources. A number of major components have no mention or description at all. In some cases, materials found in the Section 8 discussions could be folded into the Section 7 narratives. Among the elements that probably could/should receive some note are:

Dam

- What are the dimensions, materials, and design of the two sluiceways?
- What types of gates (tainter?) are in place in the sluiceways?
- Describe the two small head house structures controlling the gates for the sluiceways and canal headworks. Small, gable roof concrete structures with projecting towers capped with pyramidal roofs. The window openings on most major elevations have been infilled with smaller double-hung windows. The interiors?
- Either as part of the dam description or the canal description the headworks components should be further described (dimensions, equipment, dates, etc.) as well.
- What are the buildings to the north and southeast of the dam structure in the cleared areas? Dates, function, integrity, association to canal system? Was a decision made to include or exclude them from the nomination and why? As integral components of the operation of the site, it would seem logical to include such facilities as part of the dam/canal complex unless all integrity has been lost.
- The contributing caretaker's house should be described, perhaps taking the limited discussion in Section 8 and transferring it to Section 7.
- Is the caretaker's house part of a complex of buildings, should these all be included in the nomination? If the house is to be individually included, the verbal boundary will need to be detailed (see VBD discussion below).

PXAO used the basic information you identified here to better describe the features and additional details can be found in Section 8.

Canal System

Some mention would be expected of the typical canal features that you might anticipate finding along the canal route. Without providing a complete inventory of each feature, what are the typical elements found in these projects—weirs, siphons, culverts, embankments, etc.. It should be noted that such components when dating to the period of significance are considered to contribute to the overall historic character of the resource, while those dating from after the period do not. If there needs to be a statement regarding the regular nature of the replacement and modernization of such features, that can also be provided in the narrative or in footnotes.

PXAO added a brief description of these features under the "Canal System" subheading.

In describing the general or specific canal routes it would be useful to provide information on the general configuration or pathway. For example, curvilinear route to accommodate certain topographic features with longer straight sections where lands allowed. Were the alignments consistent over time or did they

change often as a result of modernization or urban growth? Did city growth conform to the canal or did the canals conform to urban space needs?

PXAO added some additional route data to the descriptions.

How do the canals end? We have some information on the headworks and where each canal branches from a main canal, but very little information is provided regarding their termination. Are they simply reduced to smaller and smaller laterals that end on agricultural land or are there terminating works at the natural riverways at the western end of the project? The Arizona Canal seems to end by going underground or feeding into a wide drainage, but this aspect is unclear.

PXAO added information on how each canal ends to the descriptions.

Is there a way to identify the major features/points along each of the canal routes? Is information available to say that "at mile marker YY or canal point XX there is a major diversion gate to a significant lateral," or "…the headgate to the New Cross Cut Canal is found at canal marker XYZ [412388 3706078] of the Arizona Canal," or that "at ZYZ point [410878 3705986] the modern Arizona Falls park has been incorporated in the Arizona Canal?" You can't have a description of the Arizona Canal and not note the current elements found at the former Arizona power plant site, at least to some degree. The visual at photo A3 alone should be a prompt for additional mention.

The canals are not measured via mile markers and specific details regarding their layout are provided in the HAER.

We repeatedly see in the photographs extant regulating (tainter) gate mechanisms (checking gates) crossing the canal(s). Since these appear to be major elements of the typical canal system and its regulation, there should at least be a stronger mention of them as typical elements of the built infrastructure. We don't need individual descriptions of all of them, but at least a generic discussion up front seems appropriate (see first paragraph above). [Simple, utilitarian, concrete and steel regulating gates, usually with 2 to 4 gate openings and/or overflow sluices spanning the entire width of the canal prizm, often with reinforced abutments. Simple mechanical gate mechanism now tied to electronic/computerized system(?)…Most dating from…..] If these and the feeder canal turnouts are in fact the main features defining the system, it may make sense to actually note their specific location along the canal when elaborating on the physical description of the canals, even if its just in noting the location by cross street (as in the photographs) or UTM/mile marker point.

Taintor gates are under the "Canal System" subheading.

It might make more sense to describe the New Cross Cut before the Grand Canal since this follows the linear path of water now.

Done.

New Cross Cut. The starting point of the New Cross Cut canal should be noted along with the mechanism for diversion into the canal from the Arizona canal (type, date, historic, location [in relation to Arizona canal, UTMs or city streets]). Again, a general sense that it is a straight shot except where it follows the topography of the park and the fact that a gate mechanism is found at North Thomas Road (412385 3705014) should be mentioned. Also worth noting would be the major modern takeout for the Tempe municipal water works (412603 3701424).

PXAO expanded this section to clarify the intake from the Arizona Canal and the canal route.

Crosscut Hydro Plant. It strikes me that there is more to this resource than just the powerhouse. GoogleEarth shows an upriver holding dam impoundment at the canal, intake sluices/headhouse, underground penstocks, powerhouse, power house additions, tailrace, and perhaps additional operational facilities. The Section 8 narrative further identifies additional component features (forebay, flume, embankment, page 8.49/8.57). The current sketch plan is insufficient to acknowledge exactly what is located here and what is in the boundaries of the resource and what is out. There is really no physical description of the basic powerhouse itself.

PXAO expanded the discussion of the powerhouse and clarified that the contributing component is the 1913 building.

Grand Canal. The termination point of the canal is unclear. Location? Mechanism? Into what?
PXAO expanded this discussion.

Other Canals. The same general issues pertain to all of the canals, where additional descriptive materials might be useful as well as highlighting the location of pivotal, unique, or significant features.

PXAO expanded these discussions.

Eastern Canal. Turnout mechanism at South Canal. Location? Mechanism? Termination into what? How?

PXAO clarified that the canal's turnout is at the third South Con Power Plant.

Consolidated Canal. At Hunt Highway and 587/87 How does it end? We all want to know. What exactly does it feed into and where.

PXAO expanded this discussion.

Western and Highline Canals. Are such dominant features as the intake controls at the junction of the Consolidated and Western canals, and the location of the original and 1952 pumping station for the Highland system adequately described and located? Considerable portions of both these canals seem to have been covered over at stretches. At a minimum this should be noted as a common feature of the original or later modifications to the canals, which despite these changes still convey their basic original design technology. The termination points are not just UTMs on a map, but features of the canal. The 1952 Highline Power Plant, if within the bounds of the nominated property, should be further described and may end up being considered a contributing resource depending on the reconsideration of the period of significance.

PXAO expanded these descriptions and clarified that the 1952 plant is a non-contributing resource.

Tempe Canal. The narrative history related to the Western canal mentions the earlier Tempe Canal extensively. It might make sense to change the order of these two elements in the nomination. Termination point?

PXAO moved the Tempe Canal section ahead of the Western Canal section.

Section 8 Significance. While the irrigation efforts in the area began in 1871, the resources we see today

that are a part of this nomination really reflect the management, operation and construction efforts of the Salt River Project, the Bureau of Reclamation, and the Water Users' Association, which more appropriately reflect the period 1908-1927, or perhaps 1907-1927.

PXAO retained 1906 as the starting date to reflect the year when USRS began acquiring canals for the system. It made 1927 the end date of the system completion, but expanded period of significance to 1938 to incorporate modifications made by the Association and the CCC.

The current end date for the period of significance is 1927, the date of completion for the initial program. The selection of such a date does not incorporate any of the seemingly important CCC era improvements to the system, or the later post-war (1940-1960+) efforts under the R&B program, which significantly altered such component pieces as the lateral gates (wood to concrete and metal), canal linings, and associated siphons, culverts and bridges. These alterations give the SRP Water Diversion and Conveyance System much of its current physical character. More than this, extending the period of significance would also allow the nomination to recognize the historic contributions of the operating canal system to the agricultural and community development of the area--areas so widely demonstrated in the narrative. If the resources were designated under Criterion C alone, it might make sense to end the period at the date of construction completion, but under Criterion A, the "completion" of the system was only the beginning of its historic contributions. The period of significance needs to be rethought.

PXAO expanded the period of significance to 1938 to include CCC work. PXAO prefers not to nominate the system under Criterion C.

The summary paragraph detailing significance under "Other" for the location's association with Hohokam canal development should be revised. The current resources are not eligible for listing in the National Register based on these associations, as the current physical resources in no way convey a sense of time and place connected to the Hohokam efforts. The narrative materials can be kept as anecdotal information as they raise an interesting aspect of the prior history of the Salt River Valley, but any linkage between these statements and National Register significance should be stricken.

PXAO struck this section.

The Significance Section narrative conveys far too much information, in some cases reiterating materials already found in the MPS cover document. For instance the materials on the Hohokam and pre-canal days history is redundant and of little consequence to understanding and evaluating the significance of the SRP-era resources. Since this information is already provided it may not make sense to delete it, but at some point the nominations moves from a summary document to an exhaustive (and often repetitive) reference document.

PXAO revised this section.

Section 10 Verbal Boundary Description/Map. There needs to be more precise bounds than just the start and end points of the system. The narrative statements found in the boundary justification are perhaps better suited to the boundary description than the justification, and should be augmented by a general discussion of typical dimensions for the canal routes. The boundaries around certain elements of the district—diversion dam, caretaker house and Crosscut Hydro Plant--are not sufficiently detailed as these fall outside the general parameters outlined for the canal corridors. Individual maps noting the specific boundaries at these sites would be the easiest way of documenting the proposed boundaries. At a minimum the verbal boundary description could highlight that at certain canal/district features such as the caretakers cottage and Crosscut Hydro Plant, the bounds are bumped out to encompass an area perhaps

10' (20'?) out from the exterior walls of the resources and their associated features to include sufficient setting to understand the physical context of the resource. If the Southside gatekeeper's house is a discontiguous resource because it lies outside the narrow limits of the canal/dam boundary, then that should also be noted. The verbal boundary description should allow anyone reading the nomination or visiting the site to determine where the boundary exists and which resources and setting are included and what is excluded. (If necessary for security purposes, the maps can be marked for redaction and will not be released to the public.

PXAO revised the maps to provide more detail.

Further descriptive elaboration on the termination points for the canals (see Section 7, above) might help define the rationale for the end points of the canal boundaries, which right now remain unclear at some points.

Done. See above.

Please provide an estimated acreage. Done.

Photographs. The photographs are fine and adequately reflect the important resources.

Retained.

USGS Maps

The individually nominated dams do not need to provide full scale USGS maps, as the sections maps provided in the nominations will suffice for UTM identification purposes. These maps may not be sufficient, however, for verbal boundary identification use (see specific comments above).

PXAO has revised the maps to provide more detail.

The lengthy canal segments may best be documented using the USGS maps since they are completed. The maps do highlight a few outstanding questions. Why were certain canals terminated where they were, and in general what identifies a termination point for purposes of this nomination? Why are the Old Crosscut and San Francisco canals included? If they are included additional descriptive materials are necessary. Would they constitute totally non-contributing resources, or within the bigger picture of an entire conveyance system might there be contributing segments? Since they are brought up in the various narratives there should be a discussion of how they are being treated within the nomination.

PXAO has revised the maps to provide more detail.

While there a number of issues that still need to be dealt with, overall the nomination documentation is an excellent effort. There may be room for discussion regarding the revisions to the physical descriptions, periods of significance, and boundaries, so if you have questions regarding these comments, please contact me directly at the number or e-mail listed below.

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SALT RIVER PROJECT MPS
Maricopa County, AZ
National Register of Historic Places – Preliminary Review Comments II:

Multiple Property Submission Cover Document

The revised MPS (Section E) provides an excellent overview of the themes and history of the Salt River Project and provides a solid basis for recognizing the project's historic, twentieth century significance. Likewise, Section F now provides a stronger discussion of the "distinctive characteristics" that make up a dam site, a canal system, or any other property type. While noting that the MPS cover and the individual nominations still remain somewhat repetitive with regard to presenting context information, I accept this as the agency's preference. All of the materials presented are excellently written and researched. The revisions address all of the NPS' concerns.

Footnote 3, page F-35
While it may be OK to not include all associated features at a dam site (particularly if they are at some distance from the main resource or as yet unevaluated), but it should be encouraged to draw boundaries to "*encompass, but not to exceed, the full extent of the significant resources and land area making up the property*." I wouldn't want the note to serve as encouragement to restrictive bounds as standard practice in all cases.

Done

Areas of Significance
The MPS cover document is an excellent work. There is considerable time spent in the MPS narrative outlining the significance of the SRP to the economic, industrial, agricultural and physical development of the region. All of which appears to point to the overriding significance of the Project resources in the areas of Politics/Government (role of government programs in stimulating development) and Settlement or Community Planning and Development (creation and facilitation of the development dynamo enabling exponential regional growth). These areas of significance are outlined in the MPS narrative and the Property Type Registration Requirements. Yet the individual nominations appear to overlook the later as a basis for significance, focusing solely on Politics/Government under Criterion A. This appears to miss a key aspect of the Project's overriding historical significance and the table set wonderfully by the MPS documentation. With no more than two or three revised citations the MPS cover and nominations can be revised to incorporate what is already clearly established in the narrative. (For perspective on the use of *Community Planning and Development* as an additional area of significance for these properties see: Big Creek Hydroelectric System Historic District National Register nomination NR 16000468, portions attached.) Recommend: Politics/Government AND Community Planning & Development or Settlement for each site.

We will continue to disagree on the (unfortunate) choice of restricting the individual nominations to Criterion A, where Criterion C appears to be easily justified (see below).

No additional concerns. Excellent work.

Individual Nominations

The current documentation is generally in excellent shape. There are certain areas of context and significance justification that could be revised and strengthened in order to support designation.

Below are the comments associated with each of the individual nomination forms. Certain issues pertain to all of the nominations and are discussed here first and then noted under the separate nomination discussions.

- The *Number of Contributing Resources Previously Listed in the National Register* should be marked *0* (zero) for all nominations
- Each nomination should contain a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include a statement such as: *The xxx Dam meets the Registration Requirements set forth in the Salt River Project MPS for Property Type I: Storage-Regulation Dams.*
- The Verbal Boundary Justifications need to be revised to cite the correct boundary map [Section 11, Pages 2, Map 2] not the USGS map reference.

- Areas of Significance (see MPS above)
  The MPS cover document is an excellent work. There is considerable time spent in the MPS narrative outlining the significance of the SRP to the economic, industrial, agricultural and physical development of the region. All of which appears to point to the overriding significance of the Project resources in the areas of *Politics/Government* (role of government programs in stimulating development) **AND** *Settlement* or *Community Planning and Development* (creation and facilitation of the development dynamo enabling exponential regional growth). All of these areas of significance are outlined in the MPS narrative and the Property Type Registration Requirements. Yet the individual nominations appear to overlook the later as a basis for significance, focusing solely on Politics/Government under Criterion A. This appears to miss a key aspect of the Project's overriding historical significance and the table set by the MPS documentation. With no more than two or three revised citations (Area of Significance block, Summary paragraph, opening Statement of Significance narrative) the nominations can be revised to incorporate what is already clearly established in the narrative. (For perspective on the use of *Community Planning and Development* area an additional area of significance for these properties see: Big Creek Hydroelectric System Historic District National Register nomination NR 16000468, portions attached.) Recommend: Politics/Government AND Community Planning & Development for each site.

  I continue to see nominations that clearly support NR eligibility under Criterion C (Engineering) as well as Criterion A. The narratives of almost all the individual properties note the resources as exemplary examples of a specific type and method of construction. I remain perplexed by the reluctance to proceed with Criterion C in the face of such clear justifications. Is there something I am missing in that agency decision? For purposes of these comments I will continue to note my opinions/questions regarding this

issue to be resolved as you see fit.

Mormon Flat Dam

Classification

The Resource Count should be revised to add *one non-contributing structure*. The 1971 Pump Unit (reversible pump turbine facility) is of sufficient scale and independent construction to merit counting as a separate resource.

Done and reiterated in summary paragraph.

The blank for Number of Contributing Resources Previously Listed in the National Register should be marked *0* (zero).

Done

Significance

I will reiterate my belief that the narrative context provided in the nominations need not be this extensive given the excellent MPS cover document, but I fully understand the preference to allow the individual nominations to stand alone as suitable documentation. OK as written.

For each individual nomination there should be a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include the statement: *The Mormon Flat Dam meets the Registration Requirements set forth in the Salt River Project MPS for Property Type I: Storage-Regulation Dams.*

Done

The current nomination appears to make the easy case for additional significance under NR Criterion C (Engineering) ("Under engineering, Mormon Flat Dam is a good example of a radius concrete thin-arch design…" paragraph 2, Narrative Statement of Significance). The only necessary revision to the document would be to add a check-off for Criterion C at the top of Section 8 and a minor addition to the Summary Paragraph. [*The property also meets the Registration Requirements set forth in the MPS cover document for Criterion C (Engineering).*] [Is it really the MPS contention that no dam will be significant/nominated under Criterion C unless, like Bartlett Dam, it is shown to be a "first" or "largest?"]

We are not able to make this change.

It seems to me that all of the current individual nominations could also claim significance under *Settlement* or *Community Planning & Development* (see previous discussion above). Each and every component of the SRP system had a role in supporting the economic development and growth of the greater Phoenix region. As a vital part of the SRP system each was essential to the combined success of the entire project. This would not require any substantive changes to the narrative except adding the new area of significance to the blanks at the top of the significance page and adding it to the first line of the Narrative Statement of Significance. The justification is taken care of in the narrative and in the MPS cover.

Done

Geographical Data
The Verbal Boundary Description and Verbal Boundary Justification need to be revised to cite the correct boundary map [Section 11, Pages 2, Map 2]. The current citation for USGS quad is incorrect.

Done

Bartlett Dam
Classification
The blank for Number of Contributing Resources Previously Listed in the National Register should be marked *0* (zero).

Done

Significance
For each individual nomination there should be a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include the statement: *The Bartlett Dam meets the Registration Requirements set forth in the Salt River Project MPS for Property Type I: Storage-Regulation Dams.*

Done

The first paragraph under the Narrative Statement of Significance zeros in on the controversial aspects of the dam development, almost to the point of overlooking the more general significance of this dam project as part of the larger SRP system and the significance outlined in the MPS and the Summary Paragraph. The Summary Paragraph and the Narrative Statement should support the same themes and outlines for the significance of the property, here they seem somewhat inconsistent. From the content of the significance narrative it seems as if the only significance being attributed to Bartlett Dam resides in the legal battles leading up to its construction rather than its larger significance to the SRP and its operational significance as a major component of the system. [See also the general discussion regarding *Settlement/Community Planning and Development* as areas of significance.] This is also somewhat consistent with the development of a period of significance that focuses solely on the completion of the physical plant rather than its use or role in the irrigation and development of the Phoenix area, as so brilliantly outlined in the MPS cover. The legal issues are extremely interesting, tell a significant aspect of the SRP, and are worthy of inclusion, but they seem to have hijacked the nomination.

Done

Geographical Data
The Verbal Boundary Description and Verbal Boundary Justification need to be revised to cite the correct boundary map [Section 11, Pages 2, Map 2]. The current citation for USGS quad is incorrect.

Done

It is not really clear why the 1990 new auxiliary spillway was included in this nomination. Its date and distance from the historic structures would be sufficient grounds to mention its existence, but exclude it from the nomination boundaries, as was done at Horseshoe Dam. The inclusion of this modern auxiliary spillway is confusing since the same situation at Horseshoe Dam is treated very differently. There really should be a consistent approach one way or the other, unless there is a justification for the differing decisions that is not obvious or stated in the narrative.

If the modern spillway were to be excluded, the Resource Count would need to be revised and minor tweaks would be needed in the Description and Boundary Description narrative. It is acceptable to keep it in the boundaries, without making the changes noted above, but the Verbal Boundary Description should be amended to clarify the inclusion as a discontiguous parcel, e.g. *The boundary is comprised of the [**historic**] dam structure proper, including the outlet channel, gate house, spillway, and river outlet/valve house. The new auxiliary spillway, built in the 1990s and located 1,500 yards to the south of Bartlett Dam's left abutment is [**included as a discontiguous**] non-contributing resource.*

We chose to amend the verbal boundary description and retain the map.

Horseshoe Dam

Classification

The blank for Number of Contributing Resources Previously Listed in the National Register should be marked *0* (zero).

Done

Significance

For each individual nomination there should be a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include the statement: *The Mormon Flat Dam meets the Registration Requirements set forth in the Salt River Project MPS for Property Type I: Storage-Regulation Dams.*

Done

See Community Planning & Development discussion above.

Done

Geographical Data

The Verbal Boundary Description and Verbal Boundary Justification need to be revised to cite the correct boundary map [Section 11, Pages 2, Map 2]. The current citation for USGS quad is incorrect.

Done

Map. Why does the boundary marked on the map only run down the middle length of the dam, excluding the full extent of the physical resource? Is it trying to exclude the later alterations? The dam structure is the dam structure. While notation can be made that the historic materials and design are found at the core, with later additions forming the current resource, the bounds cannot separate the two elements. The boundary map should be revised to encompass the full extent of the physical resource(s).

We revised the map following discussions with our engineers. It now contains the entire dam.

Horse Mesa Dam

Classification

The blank for Number of Contributing Resources Previously Listed in the National Register should be marked *0* (zero).

Done

The Resource Count appears inconsistent with the Boundary map, which shows three non-contributing resources. The narrative is not sufficiently clear in the delineation of contributing and non-contributing resources. A brief, clear inventory chart or inventory sentence would be helpful and help create consistency among the various nomination pieces. (see Geographical Data discussion below)

Done

Significance

For each individual nomination there should be a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include the statement: *The Mormon Flat Dam meets the Registration Requirements set forth in the Salt River Project MPS for Property Type I: Storage-Regulation Dams.*

Done

The current nomination appears to make the easy case for additional significance under NR Criterion C (Engineering) ("Under engineering, Horse Mesa Dam is a good example of a radius concrete thin-arch design…" paragraph 2, Narrative Statement of Significance). The only necessary revision to the document would be to add a check-off for Criterion C at the top of Section 8 and a minor addition to the Summary Paragraph. [*The property also meets the Registration Requirements set forth in the MPS cover document for Criterion C (Engineering).*] [Is it really the MPS contention that no dam will be significant/nominated under Criterion C unless, like Bartlett Dam, it is shown to be a "first" or "largest?"]

We are not able to make this change.

I still have some qualms regarding the notation that readers should refer to other individual nominations for the context. Referencing other nominations is not appropriate as those

nominations may change, be delisted, or otherwise altered without reference to the referencing document. This is the whole concept behind the MPS format--to create a place to hold redundant or common contextual material. In this case, since I previously approved these statements on the basis that they constituted additional background rather than essential context they may remain. (As the nomination forms are in electronic format, you may want to consider if it might just be easier to copy the shared narrative into each of the Horse Mesa, Mormon Flat, and Stewart Mountain nominations rather than trying to fit the text into the already developed MPS narrative.)

We removed the reference to the Bartlett Dam.

Geographical Data
The Verbal Boundary Description and Verbal Boundary Justification need to be revised to cite the correct boundary map [Section 11, Pages 2, Map 2]. The current citation for USGS quad is incorrect.

Done

Why does the boundary marked on the map show the outlet tunnel as a discontiguous area? While physically separated from the main dam substructure, its placement and operation in the north abutment area is not physically apart from the functioning complex. There are no modern, distracting or intervening resources that generally serve as grounds for selection of a discontiguous site. The boundary map should be revised to encompass the full extent of the physical resource(s). Perhaps there is a different means of highlighting the location of the resource and the boundary of the nomination.

The map was modified to connect the tunnel with the North spillway inlet.

The original 1924-27 powerhouse at the base of the dam is marked as a non-contributing resource on the map. Is this correct? Why was it determined to be non-contributing, as the physical description and photographs appear to show sufficient integrity to retain contributing building status. The 1970 work to install the HEFU unit appears to have created a separate, non-historic resource. The map, which shows three non-contributing resources, is also inconsistent with the resource count. It also appears as if the mapped power plants are mislabeled. (see above)

This was an error and the building status has been changed to contributing. The maps have been corrected to show the element as contributing and correctly identify its location.

Stewart Mountain Dam
Classification
The blank for Number of Contributing Resources Previously Listed in the National Register should be marked *0* (zero).

Done

Significance
For each individual nomination there should be a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include the statement: *The Mormon Flat Dam meets the Registration Requirements set forth in the Salt River Project MPS for Property Type I: Storage-Regulation Dams.*

Done

The current nomination appears to make the easy case for additional significance under NR Criterion C (Engineering) ("Under engineering, the Stewart Mountain Dam is a good example of a radius arch design…" paragraph 2, Narrative Statement of Significance). The only necessary revision to the document would be to add a check-off for Criterion C at the top of Section 8 and a minor addition to the Summary Paragraph. [*The property also meets the Registration Requirements set forth in the MPS cover document for Criterion C (Engineering).*]
[Is it really the MPS contention that no dam will be significant/nominated under Criterion C unless, like Bartlett Dam, it is shown to be a "first" or "largest?"]

We are not able to make this change.

I still have some qualms regarding the notation that readers should refer to other individual nominations for the context. Referencing other nominations is not appropriate as those nominations may change, be delisted, or otherwise altered without reference to the referencing document. This is the whole concept behind the MPS format--to create a place to hold redundant or common contextual material. In this case, since I previously approved these statements on the basis that they constituted additional background rather than essential context they may remain. (As the nomination forms are in electronic format, you may want to consider if it might just be easier to copy the shared narrative into each of the Horse Mesa, Mormon Flat, and Stewart Mountain nominations rather than trying to fit the text into the already developed MPS narrative.)

We removed the reference to other forms.

Geographical Data
The Verbal Boundary Description and Verbal Boundary Justification need to be revised to cite the correct boundary map [Section 11, Pages 2, Map 2]. The current citation for USGS quad is incorrect.

Done

Salt River Diversion and Conveyance System Historic District
Classification
The blank for Number of Contributing Resources Previously Listed in the National Register should be marked *0* (zero).

Done

Significance

For each individual nomination there should be a clear notation linking the individual document to the MPS cover document. For example, at the end of the Summary Paragraph include the statement: *The Salt River Project Diversion and Conveyance district meets the Registration Requirements set forth in the Salt River Project MPS for Property Type II: Diversion-Conveyance System and Type III Powerplants.*

Done

Areas of Significance. See Community Planning & Development discussion above.

Done

Obviously we will keep the extensive narrative as written at this point, but just to note that the content was somewhat distracting in the depth of information provided on work undertaken prior to SRP involvement. It was often confusing trying to match historic events to the extant nominated resources.

Geographical Data

While I understand USBR's hesitancy to include significant "open" land areas within the boundaries of the particular nominations, the use of discontiguous boundaries and extremely tight boundary lines should be approached cautiously. The NR guidelines call for establishing district boundaries:

> *…to encompass the single area of land containing the significant concentration of buildings, sites, structures, or objects making up the district. The district's significance and historic integrity should help determine the boundaries. Consider the following factors:*
>
> ***Visual barriers** that mark a change in the historic character of the area or that break the continuity of the district, such as new construction, highways, or development of a different character.*
> ***Visual changes** in the character of the area due to different architectural styles, types or periods, or to a decline in the concentration of contributing resources.*
> ***Boundaries at a specific time** in history, such as the original city limits or the legally recorded boundaries of a housing subdivision, estate, or ranch.*
> ***Clearly differentiated patterns** of historical development, such as commercial versus residential or industrial.*
>
> - *A historic district may contain **discontiguous** elements only under the following circumstances:*
>
> ***When visual continuity is not a factor** of historic significance, **when resources are geographically separate**, and **when the intervening space lacks significance** : for example, a cemetery located outside a rural village.*
>
> ***When manmade resources are interconnected by natural features** that are excluded from the National Register listing: for example, a canal system that incorporates natural waterways.*
>
> ***When a portion of a district has been separated by intervening development** or highway construction and when the separated portion has sufficient significance and integrity to meet the National Register criteria.*

Given these guidelines the boundaries shown on Map 2 for the Granite Reef Diversion Dam appear too narrowly focused, excluding what would logically be consider the functional and operational setting of the historic structures as they exist on the landscape. Please consider

revisions to the map/boundaries that encompass the full extent of the entire historic resource, including any surrounding land historically associated with the resource that retains its historic integrity and contributes to the property's historic significance.

Revised the map to make the property contiguous.

Otherwise, excellent discussion of verbal boundary limitations.

Please feel free to contact my office if you have any questions regarding this nomination. I look forward to seeing the final nomination documentation.

I REMAIN (very) IMPRESSED

Paul R. Lusignan, Historian
(for) Keeper of the National Register
(202) 354-2229

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United States Department of the Interior

BUREAU OF RECLAMATION
P.O. Box 25007
Denver, CO 80225-0007

JUN 20 2017

IN REPLY REFER TO:

84-53000
ENV-3.00

MEMORANDUM

To: J. Paul Loether, Chief, National Register of Historic Places Program, National Park Service, 1201 Eye Street, NW (2280), Washington, DC 20005
Attn: Mr. Paul Lusignan

From: Roseann Gonzales
Director, Policy and Administration

Subject: Nomination of the Salt River Project (Project), Maricopa County, Arizona, as a Multiple Property Listing (MPL) in the National Register of Historic Places (National Register), and Nominations of Associated Properties under the MPL

The Bureau of Reclamation is pleased to nominate the Salt River Project as an MPL on the National Register. We are concurrently individually nominating five associated Project dams, and nominating the Project's diversion and conveyance system as a historic district. The multiple property documentation (MPD) form and associated property registration forms, with supporting information, are attached. All forms are submitted in electronic format on the two enclosed compact disks, with the required hard copy of the original signature sheet for each of the six property nomination forms. In order to provide an original signature for both the Federal Preservation Officer (FPO) and the State Historic Preservation Officer (SHPO), two copies of each signature page is attached. As is also required, I confirm that the enclosed compact disks contain the true and correct nomination forms for the Salt River Project MPD; for the Salt River Project Diversion and Conveyance System Historic District; and for Bartlett Dam, Horse Mesa Dam, Horseshoe Dam, Mormon Flat Dam, and Stewart Mountain Dam.

The nomination forms were submitted for review to the Arizona SHPO and the SHPO signed the forms without comment. In Arizona, the State Review Board does not review Federal nominations. Reclamation provided all seven forms to Maricopa County for review by their Board of Supervisors, who are the chief local elected officials. The 45-day comment period closed on May 25 without Reclamation receiving comment from the County. Although not required for Federal nominations, Reclamation also provided the MPD and historic district forms to the six Certified Local Governments (CLG) established within the greater Phoenix metropolitan area; they were not provided with the dam nomination forms because the Project dams lie outside of the jurisdictional boundary of a GLG. The comment period closed with only the City of Glendale responding to say they had no comment at this time, and that they found the "materials were very well put together."

The Project and the associated properties are important pieces of Western reclamation history. Although some modifications have occurred to keep the structures operational, in large part the nominated properties retain levels of design, materials, workmanship, feeling, and overall integrity sufficient to convey their historic character and function. They demonstrate the historic importance of this irrigation and hydropower system that was instrumental in the transformation of the Phoenix basin into one of the great regional centers of the West.

If you have any questions, please contact Mr. George Herbst, FPO, at 303-445-3311, or gherbst@usbr.gov, or Ms. Lynne MacDonald, cultural resources specialist, at 303-445-3206, or lmacdonald@usbr.gov.

Attachments - 14

cc: Archeologist, Bureau of Reclamation, 500 Fir Street, Boulder City, NV 89006-1470, Attn LC-2633 M. Slaughter
Archeologist, Bureau of Reclamation, 6150 W Thunderbird Road, Glendale AZ 85306-4001 Attn: PXAO-1500 D. Gifford
Supervisory Environmental Protection Specialist, Bureau of Reclamation 6150 W Thunderbird Road, Glendale AZ 85306-4001 Attn: PXAO-1500 S. Heath
Archeologist, Bureau of Reclamation, 6150 W Thunderbird Road, Glendale AZ 85306-4001 Attn: PXAO-1500 L Jelinek,
(all w/o att)