ASSESSMENT OF THE VERDE RIVER'S NAVIGABILITY PRIOR TO AND ON THE DATE OF ARIZONA'S STATEHOOD, FEBRUARY 14, 1912

by

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032

TABLE OF CONTENTS

LIST OF MAPS AND OTHER ILLUSTRATIONS

I. EXECUTIVE SUMMARY

This report is a revised and expanded version of "Assessment of the Verde River's Navigability Prior to and on the Date of Arizona's Statehood, February 14, 1912," by Douglas R. Littlefield. The earlier report was dated October 3, 1997, and was previously submitted to the Arizona Navigable Stream Adjudication Commission. The purpose of this new report is to assess in greater detail the possible navigability (or lack thereof) of the Verde River between its headwaters near Paulden, Arizona, downstream to its confluence with the Salt River near Phoenix on or before February 14, 1912 – the date Arizona became a state.

To make the evaluation of the Verde River's navigability in 1912, a wide array of published and unpublished documents and photographs were consulted (discussed in greater detail in the Introduction to this report and listed in the footnotes and appendices). This survey of hundreds of primary and secondary sources yielded a wide spectrum of historical views of the Verde River, from U.S. Government surveys and reports, land settlement records created by the U.S. and Arizona authorities, explorers' journals, diaries, early pioneer reminiscences, historical photographs, newspaper accounts, and many other types of records.

Taken as a whole, these records overwhelmingly illustrate that prior to and at the time of Arizona's statehood the Verde River was considered to be not navigable by virtually every contemporaneous observer. The historical record amply demonstrates that the Verde River was highly erratic, subject to flooding and major channel changes, blocked by obstacles (both natural and manmade), and diverted for irrigation needs. In short, the Verde River was not navigable on February 14, 1912.

II. INTRODUCTION

The determination of the ownership of the bed of a river or lake anywhere in the United States is related to the characteristics of that body of water at the time the region became a state. The historical basis for this legal doctrine stems from the original thirteen American colonies' relationship with the Crown of England. Over centuries, English common law had evolved to establish that the King owned the beds of navigable waterways in order to protect their accessibility for his subjects. This royal power had developed in order to prevent parties from building structures such as wharfs, docks, or mill dams that might interfere with boat traffic in rivers or streams. The beds of non-navigable waterways where transportation was not an issue, in turn, remained vested in adjacent landowners. This legal principle was well established long before the American Revolution, and it therefore applied to the English colonies in the new world as well as to lands within England. Following the end of the Revolution in 1783, the rights and duties of the Crown passed to the newly independent states by virtue of their sovereignty. This made the original thirteen American states the owners of the beds of navigable streams and lakes within their borders. Because new states enter the Union on an equal basis to the original thirteen – a legal principle known as the "equal footing" doctrine – those new states become the owners of the beds of navigable waterways within their borders.

In Arizona's case, this "equal footing" tenet means that the State has a claim to sovereign property under any streams or lakes within the State that were navigable on February 14, 1912 – the date Arizona joined the Union.[1] If the stream was not navigable in 1912, ownership of the bed remained in the United States Government's hands until lands adjacent to the body of water

[1] The fundamental U.S. Supreme Court case confirming this doctrine is *The Steamer Daniel Ball v. United States*, 77 U.S. 999 (1871).

were patented or otherwise disposed of. At that time, the bed of the stream or lake became the property of the individual land owners next to the body of water.

A. PURPOSE OF THIS REPORT, GEOGRAPHICAL LIMITS, AND CHRONOLOGICAL PERIOD CONSIDERED

This report examines the characteristics of the Verde River at the time of Arizona's statehood on February 14, 1912. The report is intended to assist in determining whether that stream was navigable or susceptible of such navigation as of that date. Although the test for navigability for title purposes focuses on the actual date of statehood, the chronological time period covered by this report extends from the pre-statehood era to the years shortly after Arizona's admission to the Union to provide as many descriptions of the Verde River as possible near the precise date of statehood. In general, the geographic area discussed in this study extends from the Verde River's headwaters near Paulden, Arizona (about twenty-five miles north of Prescott), downstream to where the stream flows into the Salt River. Nevertheless, because the lands along the Verde River lying south of the town of Camp Verde (located in sections 31 and 32 of township 14 north, range 5 east) to the Verde's confluence with the Salt River were withdrawn from the public domain for various reasons such as U.S. Bureau of Reclamation projects, national forests, and Indian reservations, those lands are not addressed in Part III (which deals with U.S. Government surveys) and Part IV (which covers U.S. patents and grants to Arizona and State patents). The remaining sections of this report, however, consider documents relating to the Verde River along its entire length.

B. REASEARCH AND WRITING METHODOLOGY

A wide variety of published and unpublished documents were utilized in creating this report. The vast majority of these historical records are primary sources to obtain the most accurate descriptions of the Verde River. To locate as many materials as possible shedding light on the characteristics of the Verde River in 1912, a preliminary list of search terms was developed for locating records in as many archives, depositories, libraries, and government agencies as possible. This list was supplemented as research brought to light new topics related to the Verde River. Since individual locations have different means of listing their document holdings, the research term list was modified to accommodate specific sites.

1. Arizona State University Archival and Library Holdings

Early research was conducted at Arizona State University's main library in Tempe. This library houses the University's Archives and Manuscript Division in the Luhrs Reading Room (which focuses on Arizona and Southwest history) in addition to the privately funded Arizona Historical Foundation. Both archives contain excellent collections of source materials (published as well as unpublished) and extensive collections of books focusing on the history of Arizona. The computer on-line manuscript database – containing file titles from each manuscript collection at the library – was first searched. Printed finding aids were also reviewed. The resulting manuscripts in these collections provided eyewitness accounts of the Verde such as descriptions of floods, the river's channel, and local activities taking place on or near the stream. The manuscript collections also yielded useful insights on the development of irrigation systems along the Verde, including reservoirs, diversion dams, and canals.

Arizona State University also held a complete set of Arizona statutes. Territorial statutes were searched for laws relevant to navigability and public land disposal.

2. University of California at Berkeley, California

Also useful was the Water Resources Center Archives at the University of California, Berkeley. Although located in California, this library is one of the premier depositories for manuscript collections and published government reports relating to water resources in the entire United States and particularly the American West. The Water Resources Center Archives contains manuscript collections of the papers of prominent civil engineers, whose work dealt extensively with irrigation, flood control, and hydroelectric power – including studies that were done in the Verde River area. The Water Resources Center Archives also holds many published government documents relating to water issues, including a complete set of published *U.S. Geological Survey Water Supply Papers* and *Bulletins* (some of which were relevant to the history of the Verde River Valley) as well as the U.S. Reclamation Service's *Annual Reports*.

The University of California, Berkeley, was also the site of research on boating and watercraft around the time of Arizona's statehood. Because navigability and the susceptibility of navigability for land title purposes centers on the dates that individual states joined the Union, the types of watercraft in use at a particular time of statehood are relevant to the issue of the ownership of the beds of waterways. In relation to the Verde River, published reports of the Commissioner of Corporations on Transportation by Water were examined to determine how technology had progressed on shallow watercraft by 1912. Also examined were records about boating on the Colorado River. This river was a catalyst for advances in boating technology because of its swift current, shallow water, and frequently changing channel. Information on watercraft on the Colorado is useful to understand river boating throughout the West – including on the Verde – in the late nineteenth and early twentieth centuries.

The Bancroft Library, also at Berkeley, is one of the most important depositories for unpublished primary source materials and rare secondary source records on the history of the

American West. Collections of unpublished documents at the Bancroft relating to the Verde were reviewed as well as published reports of nineteenth-century explorations of the area. Since many of the individuals who visited the region were there specifically to report on its potential, their reports are especially useful to ascertaining the historical nature of the Verde River.

3. U.S. and State Government Agency Reports and Other Records

Following research at the Bancroft Library and the Water Resources Center Archives, reports and studies conducted by U.S. Government agencies were reviewed. Most of these reports covered such topics as flood control, irrigation, and the utilization of natural resources in the Verde River Valley. These documents provided descriptions of the Verde at different points in time leading up to and shortly after Arizona's statehood. Some of the reports are specific to the Verde River, but much of the information found was contained in larger studies of Arizona. In addition, a computer search was done of files compiled by the Congressional Information Services (CIS) to find Congressional documents, hearings, and reports relevant to the Verde River.

The Rocky Mountain branch of the U.S. National Archives in Denver, Colorado, was also visited to undertake a thorough search of Record Group 115, records of the U.S. Bureau of Reclamation. Most of these records are organized into two chronological periods, with the 1902-1919 group containing material relevant to this study. These records provided a rich source of information from an agency directly involved with research on the river's potential around the time of statehood.

In addition to the sources obtained at Arizona State University and the University of California, Berkeley, documents held by the U.S. Bureau of Land Management in Phoenix were reviewed – records that are some of the most important concerning the Verde River around the

time of statehood. The Bureau of Land Management holds the records of the original U.S. General Land Office surveys carried out to prepare the public domain for homesteading; these records include original surveyors' plats and field notes. Since surveyors were required to "meander" all navigable bodies of water (provide details on their courses) and to keep precise notes of these meanders, survey documents are vital to understand what the Verde River was like at the time of those surveys.

The Phoenix office of the U.S. Bureau of Land Management also provided copies of U.S. General Land Office Master Title Plats and Historical Indexes. These records were used to determine how the U.S. Government disposed of the public lands in Arizona through which the Verde River flowed. From this material, any U.S. patent that either overlaid or bordered the Verde River was obtained. Federal patents were critical in determining how the U.S. Government viewed public lands in Arizona. The U.S. National Archives in Washington, D.C., provided supporting paperwork for federal land patents such as applications and affidavits of witnesses. Federal patents and their files, combined with historical maps, were used to create Exhibits 1-6, which illustrate the location of all patents and federal land grants along the Verde River. Exhibits 1-6 are reproduced in Part III of this report.

The Arizona State Archives in Phoenix provided documents and manuscript collections of State agency records. These materials included the unpublished papers of agencies such as the Arizona State Land Department, the Arizona Water Commissioner, the Arizona State Planning Board, and the Arizona Secretary of State. The papers of the State Land Department were particularly useful for historical information on how Arizona disposed of the lands along the Verde River granted to the State by the U.S. Government.

After reviewing the historical records of the Arizona State Land Department at the State Archives, research was also done at the agency's Phoenix office. Although most of the patent information for land along the Verde River was found at the U.S. Bureau of Land Management in Phoenix and the U.S. National Archives in Washington, D.C., the Arizona State Land Department provided copies of patents issued by Arizona in parcels granted to the State by the U.S. Government. Exhibit 7 in Part III of this report illustrates the location of some of these State patents. Some of the corresponding application files for the State patents were also obtained and reviewed.

4. Salt River Project Archives

The Salt River Project Archives in Tempe also was a critical location for research. The material found at the Salt River Project Archives was useful as a lead-in to research at the U.S. National Archives in Washington, D.C. While at the National Archives, a wide variety of federal agency files, including those of the U.S. Bureau of Indian Affairs, the U.S. Army Corps of Engineers, the U.S. Bureau of Land Management, the Office of the Secretary of Interior, and the U.S. Geological Survey were searched. These records contain unpublished paperwork substantiating the conclusions gleaned from published U.S. Government documents.

C. ORGANIZATION OF REMAINDER OF REPORT

Based on this extensive research, it became evident that some of the most important records dealing with the Verde River were the U.S. General Land Office's original surveys and patent records. Therefore, the next sections, Parts III and IV, of this report deal with the significance of those documents. Other U.S. Government documents (both published and unpublished) will be discussed in Part V. Part VI is a review of miscellaneous documents, including photographs not associated with other historical reports or records. Part VII contains a

discussion of boats and other watercraft typically used on western rivers around the turn of the century. Following a general summary and a statement of conclusions, there are appendices containing sources consulted for this report as well as the resume of Douglas R. Littlefield. To facilitate reference throughout the main body of the report, footnotes run continuously rather than starting from number one in each chapter.

III. U.S. GOVERNMENT RECORDS – FEDERAL SURVEYS

Some of the most important records created in relation to the Verde River prior to and around the time of Arizona's statehood in 1912 are those of the U.S. Government, especially federal surveys done by the General Land Office (today, the Bureau of Land Management). When the United States became the owner of the vast territory acquired from Mexico after the end of the Mexican War in 1848, federal officials were anxious to determine the value of what the U.S. had gained. Moreover, they wanted to prepare the region for orderly occupation by American settlers to solidify control. To ready the new lands for homesteading and to record those lands' characteristics, the federal government undertook formal surveys by the U.S. General Land Office. Because those surveys were highly detailed, the original plats of the area near the Verde River and the related survey field notes contain a wealth of information about the nature of that stream.

A. SURVEYORS' MANUALS

Due to the need for accuracy and consistency in carrying out the federal surveys, the U.S. Government issued a series of manuals to direct surveyors in their work. In many cases, surveyors specifically were directed by their surveying contracts to use these manuals. It is important to understand the books' provisions and how they changed over time in order to recognize their significance in relation to the issue of the Verde River's navigability or non-navigability.

1. The 1851 *Manual*

The 1851 *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* governed how some of the earliest public land surveys were done in the American West. This *Manual* had been adopted by the General Land Office to standardize survey work in California and Oregon, which were the most significant areas of western American settlement in the late 1840s. The 1851 *Manual* was the first formal surveying handbook issued by the U.S. Government to provide guidance for surveyors mapping the vast public domain acquired from Mexico; previously, the Government had issued directions to surveyors in the field on an individual basis or through Surveyors General assigned to specific territories.[2]

The *Instructions to the Surveyor General of Oregon* provided that public lands were to be subdivided into a series of ever-smaller grids-within-grids to allow the precise location of individual tracts. This system would facilitate the disposal of the public domain in an orderly fashion and at the same time record the characteristics of that land in substantial detail. The largest grids were to be six miles square and were to be created by the surveying of township and range lines. The directions in the *Instructions to the Surveyor General of Oregon* providing for the establishment of these large blocks derived from the same processes that had been used in earlier public land territories and states, procedures that had first been enacted into law in the *Land Ordinance of 1785*.[3] The first surveys under this legislation had been undertaken in what is

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[2] The *Instructions to the Surveyor General of Oregon* is reprinted in C. Albert White's *A History of the Rectangular Survey System* on pages 433-456. White's book was published by the U.S. Government in 1983 as a review of all practices used by federal surveyors on public domain lands since the initial surveys of the Old Northwest (today, Ohio and other parts of the upper Midwest) were undertaken in the late 1700s. Aside from a detailed history of those procedures, White's book reprints many of the original surveying instructions. See C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983).

[3] For details on the *Land Ordinance of 1785*, see Paul W. Gates, *History of Public Land Law Development* (Washington, D.C.: Zenger Publishing Co., Inc., 1968), pp. 59-74. Gates's seminal study of the history of public lands had been undertaken by direction of Congress (78 Stat. 982), which in 1964 had created the Public Land Law Review Commission. See ibid., pp. ii-iii, 807-814.

today the State of Ohio. The grid procedure was used in most new territories added to the United States in the years that followed.

To establish township and range lines, a base line and meridian were chosen within the state or territory to be surveyed. In Arizona, the initial base line and meridian intersected at a point on a hill just south of the junction of the Salt and Gila rivers near Phoenix. That location had been chosen in 1865 by John A. Clark, Surveyor General of New Mexico Territory, to begin the Arizona surveys. (Arizona was a part of New Mexico Territory until 1863, but Clark's directions covered both territories.) Clark's selection for the beginning marker for the Arizona surveys was a point that originally had been established by the Mexican Boundary Commission in 1851 as a location on the U.S.-Mexico border prior to the Gadsden Purchase of 1853, which created the present boundary between the United States and Mexico. Actual surveys did not begin in Arizona, however, until 1871.[4]

Using the Gila and Salt River Base and Meridian to start, federal surveyors ran township and range lines in Arizona by working their way gradually north and south to create township lines and east and west to establish ranges. Each township and range line was one mile apart from the next. The one-square-mile blocks that resulted were called townships (as distinct from township lines). Surveyors numbered the townships on the basis of how far north or south and east or west of the initial base and meridian they lay. For example, the first township to the north and east of the intersection of the Gila and Salt River Base and Meridian was identified as township 1 north, range 1 east. The township directly north of that was township 2 north, range 1 east, and the township to the east of that point was township 2 north, range 2 east. All townships to the south and west of the initial base and meridian were identified in a similar

[4] C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 137, 147.

fashion. In the region of concern to this report – the area along the Verde River from the stream's headwaters near Paulden, Arizona (north of Prescott) to the confluence with the Salt River just east of Phoenix – the lands examined lie in townships 2 to 18 north and ranges 1 to 17 east and 1 to 2 west. (The Verde River crosses the Gila and Salt River Meridian – the starting point for numbering ranges either east or west.)

Simply translated, this means that the area of focus of this report is located in the following areas: 1) the second through the eighteenth tiers of townships north of the Gila and Salt River Base, 2) the first through seventh tiers of townships east of the Gila and Salt River Meridian, and 3) the first and second tier of townships west of that meridian. (This chapter, however, does not address lands lying between township 13 north, range 5 east, southward to the Verde's confluence with the Salt River. These areas were withdrawn from the public domain for various reasons such as U.S. Reclamation Service projects, national forests, and Indian reservations. See the map reproduced in Chapter Two for details on these withdrawals from the public domain. There are, therefore, few U.S. General Land Office survey records for this region.)

The entire Verde River and the townships through which it flows easily can be located on the U.S. Geological Survey's relatively recent topographical maps of the region. By examining the maps, it is clear that, with a few exceptions, the channel of the Verde River is confined to a small canyon with steep walls on either side. The U.S. Geological Survey topographic maps also illustrate that it is unlikely the stream's channel has changed in any significant degree over the years since the nineteenth century due to the close confines of the surrounding valley walls. The U.S. Geological Survey quadrangle maps covering the Verde River area – which are reproduced below – are, going downstream:

Chino Valley North (1974)
Paulden (1979)
Hell Point (1979)
King Canyon (1979)
Perkinsville (1973)
Munds Draw (1973)
Clarkdale (1973)
Cottonwood (1973)
Cornville (1968)
Middle Verde (1969)
Camp Verde (1969)
Horner Mountain (1967)
Hackberry Mountain (1967)
Verde Hot Springs (1967)
Wet Bottom Mesa (1967)
Chalk Mountain (1967)
Horseshoe Dam (1964)
Lion Mountain (1964)
Maverick Mountain (1964)
Bartlett Dam (1964)
Fort McDowell (1964, photo revised 1974)
Granite Reef Dam (1964, photo revised 1974)

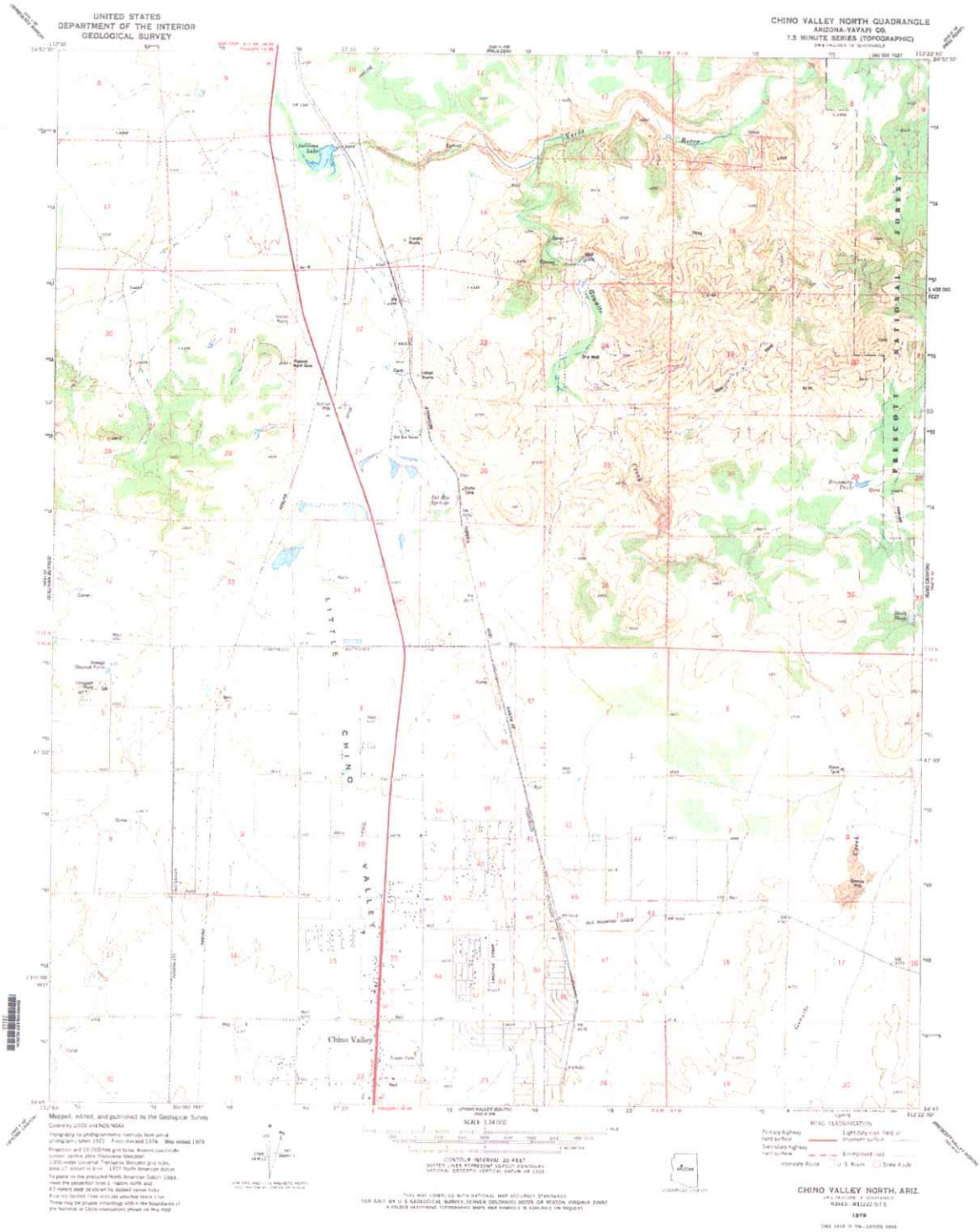

Figure 1. U.S. Geological Survey topographic map, Chino Valley North, Ariz., 1974

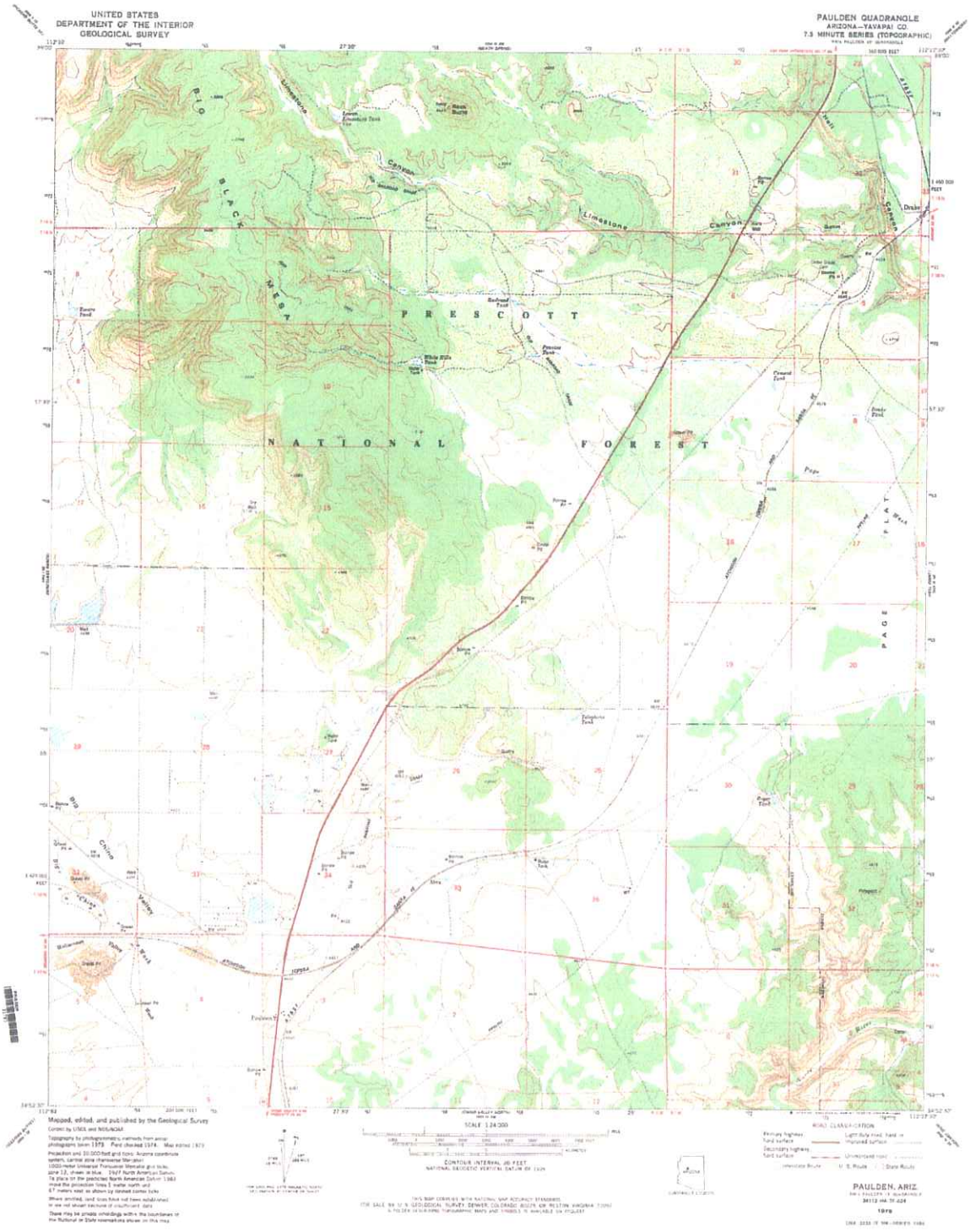

Figure 2. U.S. Geological Survey topographic map, Paulden, Ariz., 1974

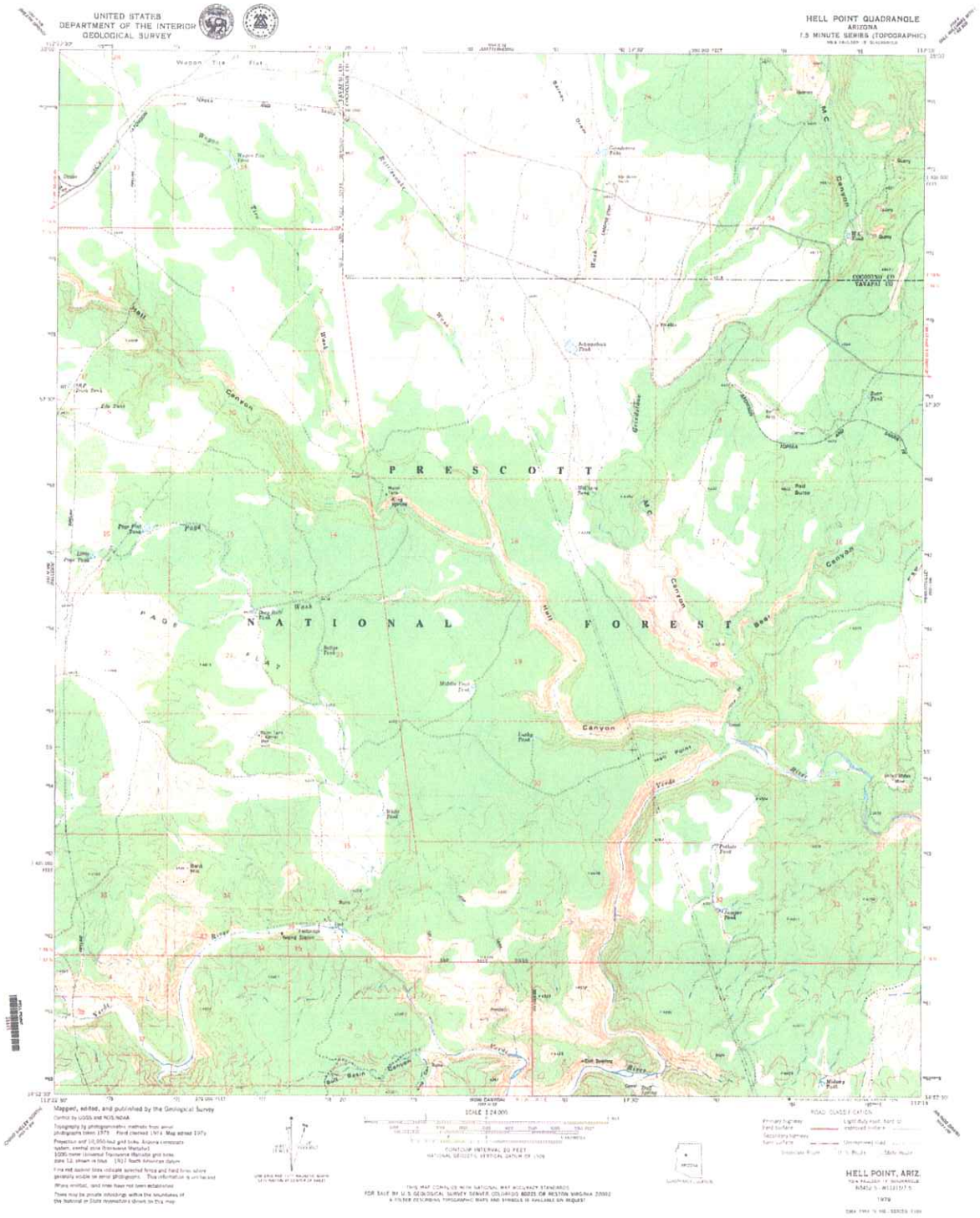

Figure 3. U.S. Geological Survey topographic map, Hell Point, Ariz., 1979

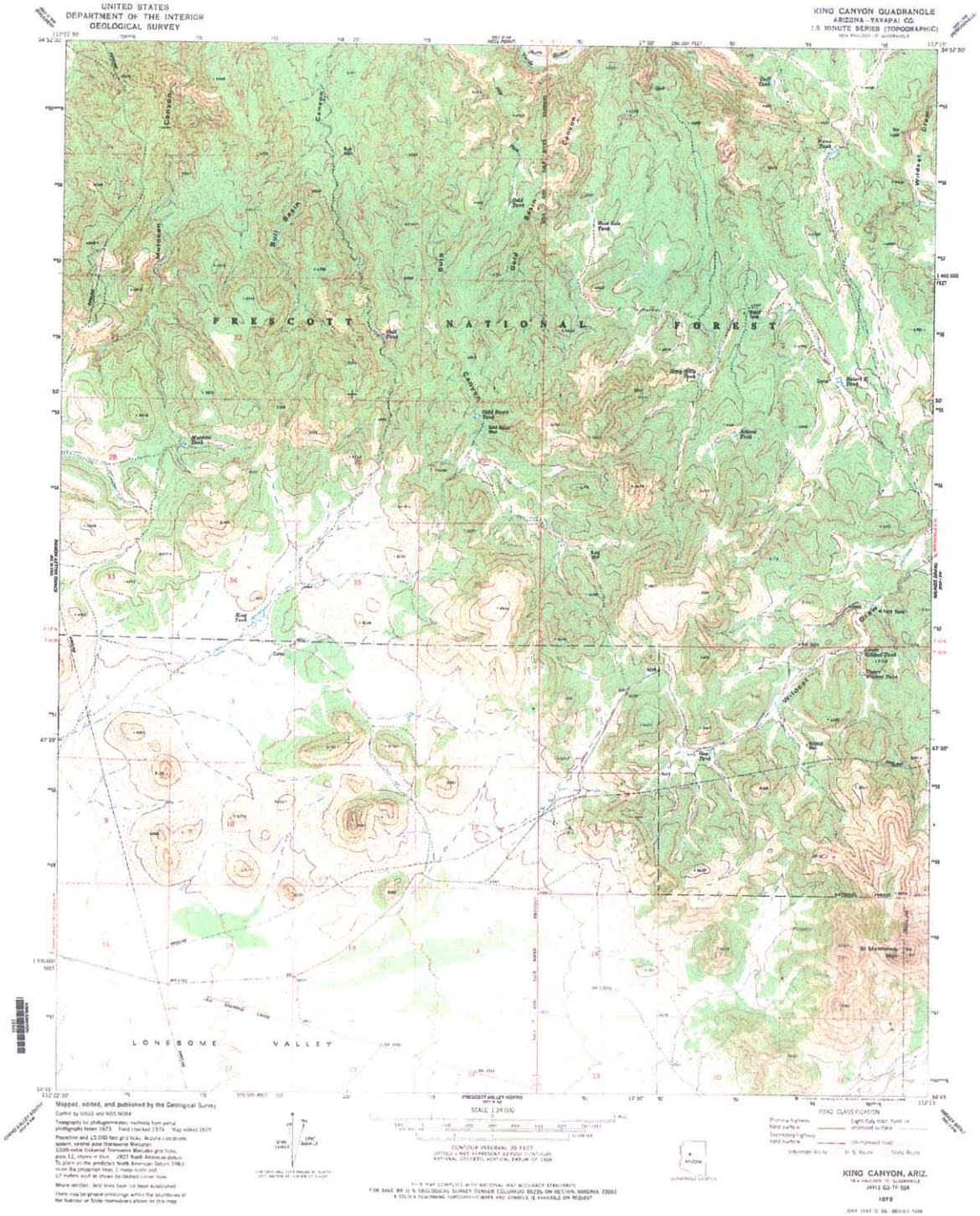

Figure 4. U.S. Geological Survey topographic map, King Canyon, Ariz., 1979

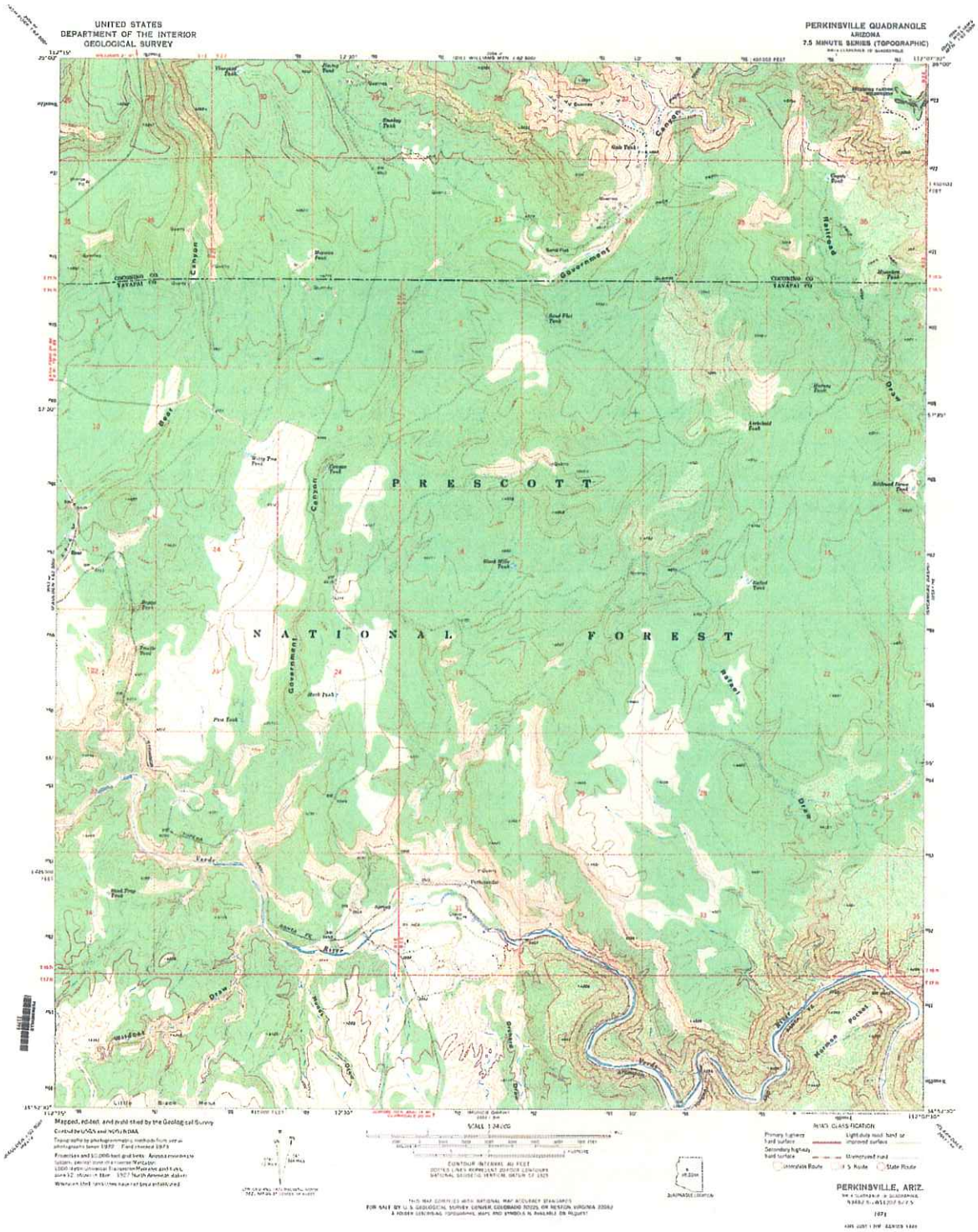

Figure 5. U.S. Geological Survey topographic map, Perkinsville, Ariz., 1973

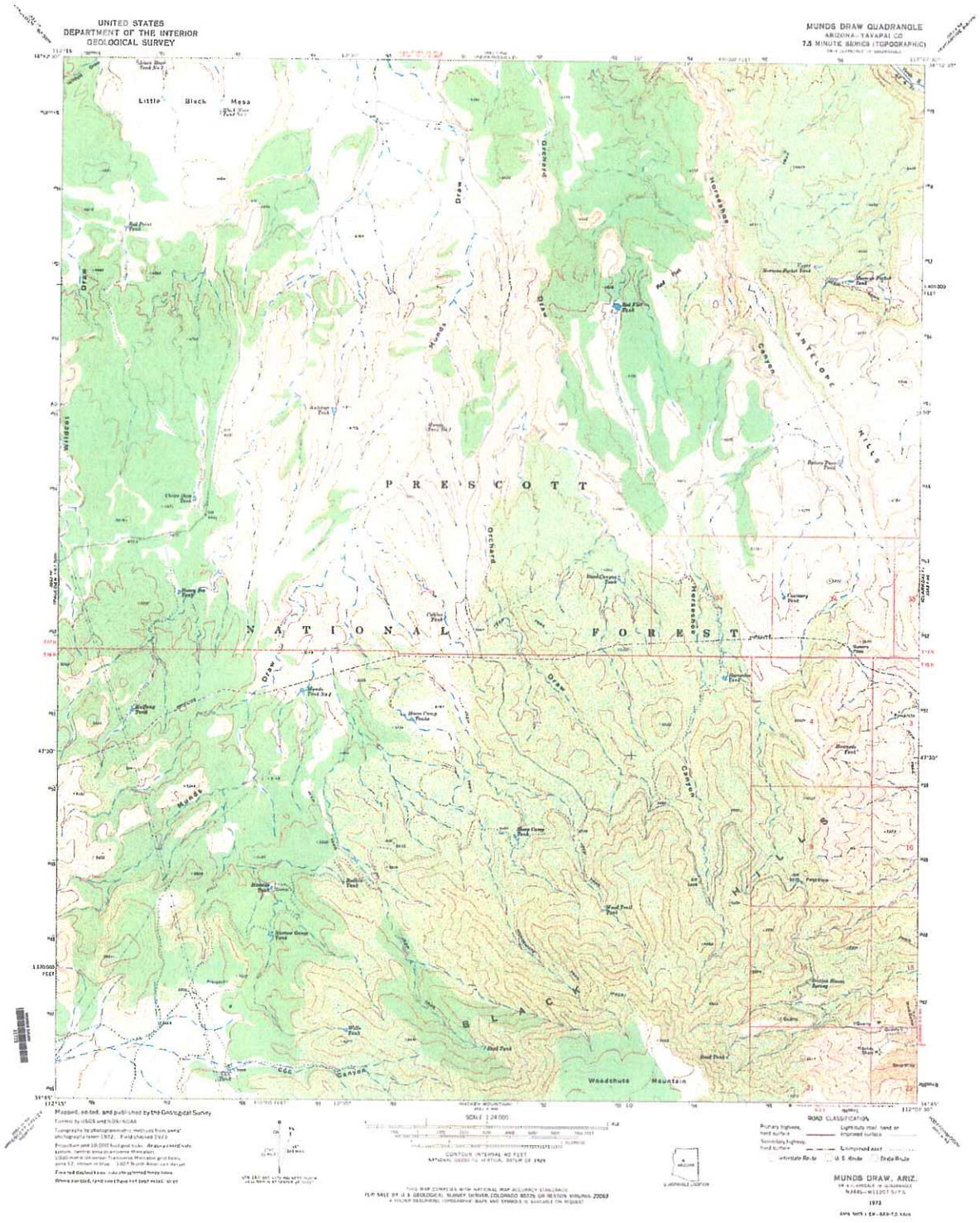

Figure 6. U.S. Geological Survey topographic map, Munds Draw, Ariz., 1973

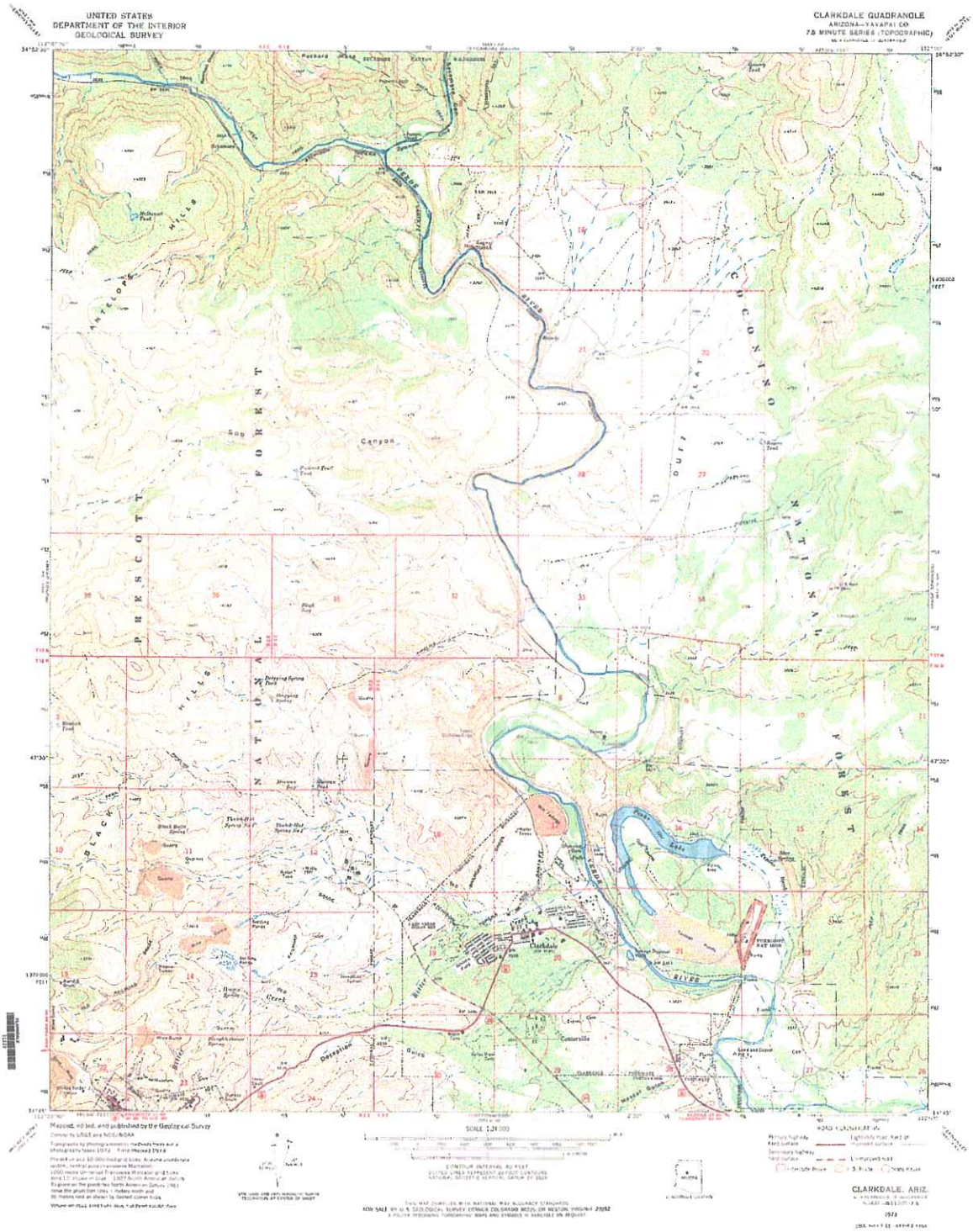

Figure 7. U.S. Geological Survey topographic map, Clarkdale, Ariz., 1973

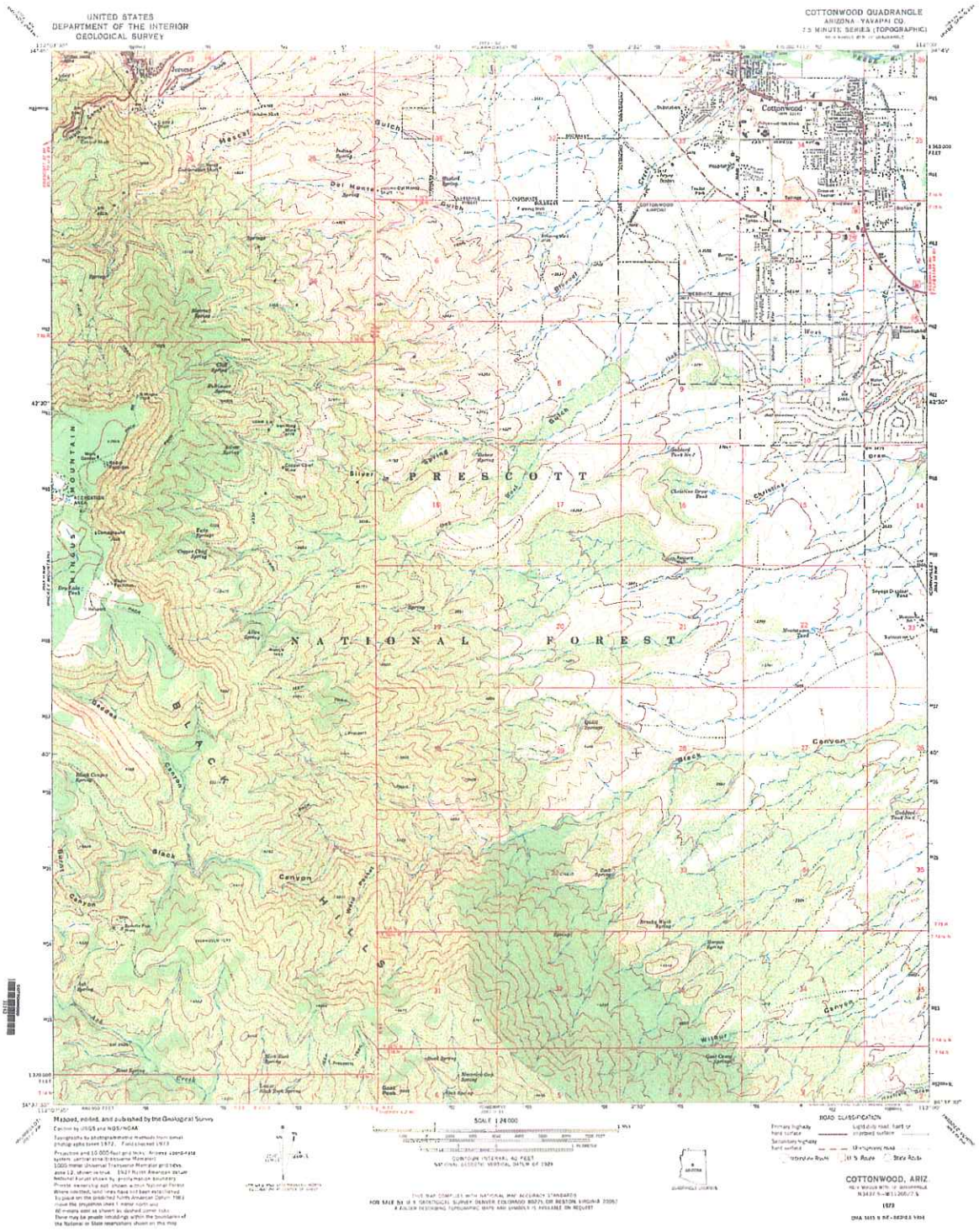

Figure 8. U.S. Geological Survey topographic map, Cottonwood, Ariz., 1973

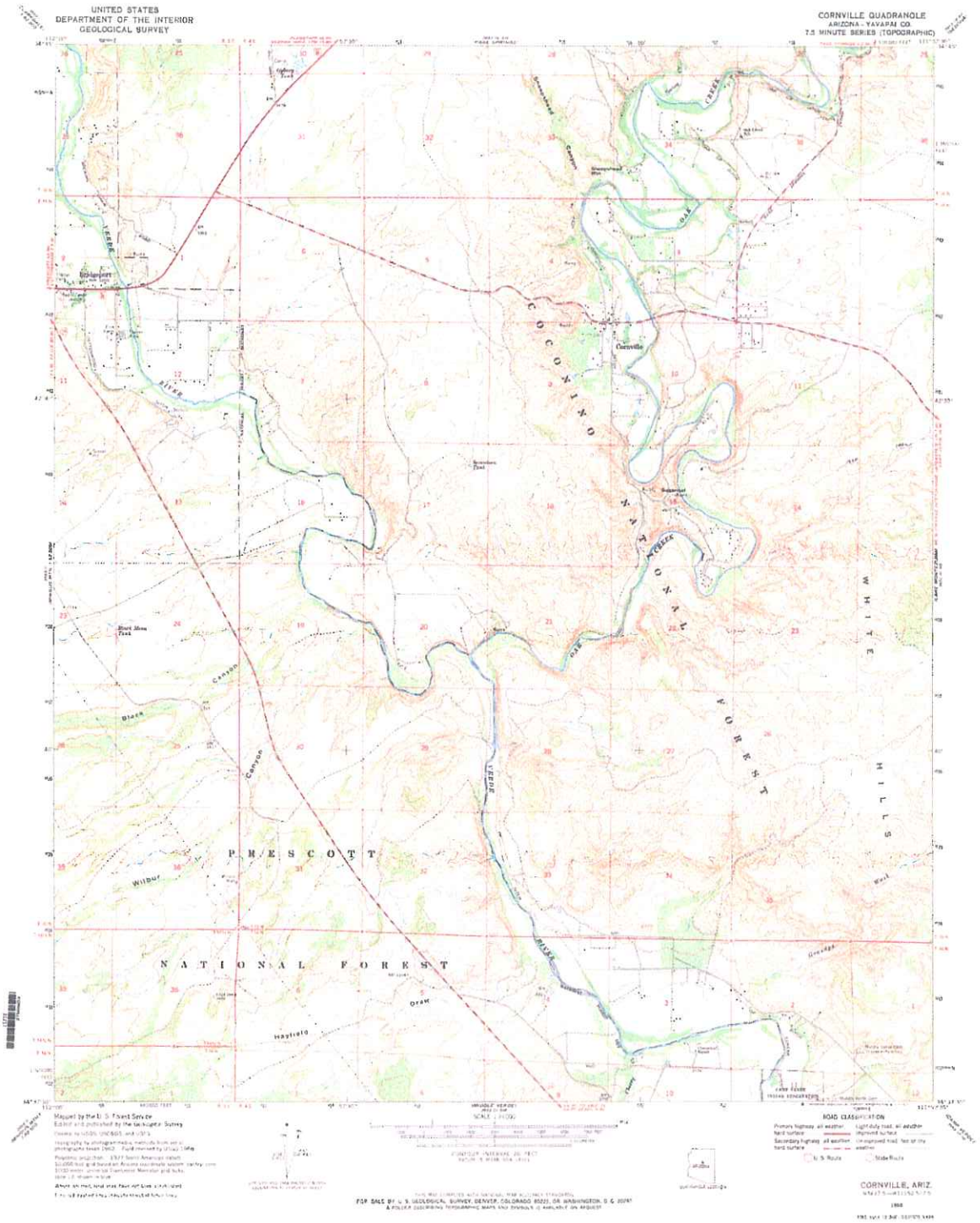

Figure 9. U.S. Geological Survey topographic map, Cornville, Ariz., 1968

Figure 10. U.S. Geological Survey topographic map, Middle Verde, Ariz., 1969

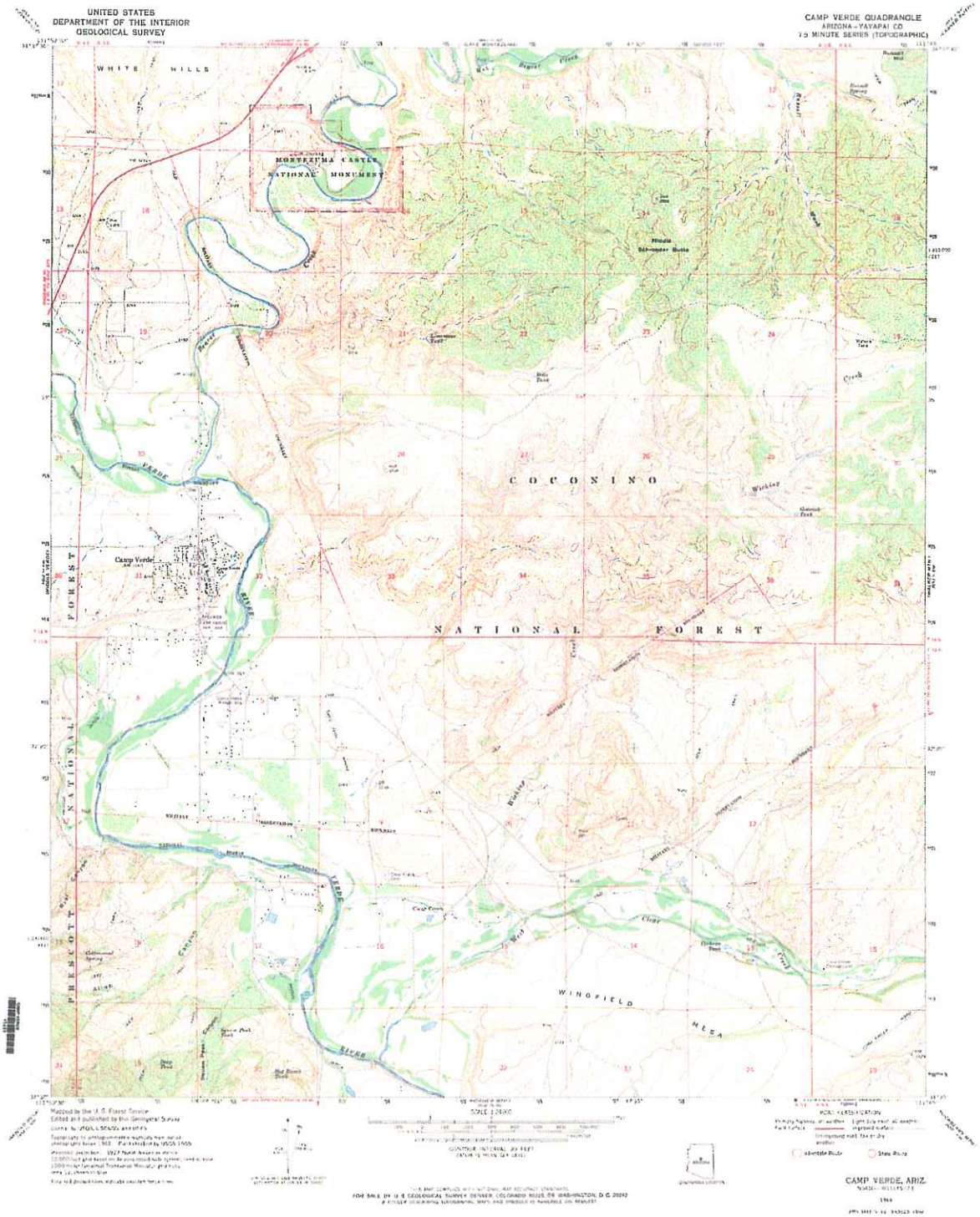

Figure 11. U.S. Geological Survey topographic map, Camp Verde, Ariz., 1969

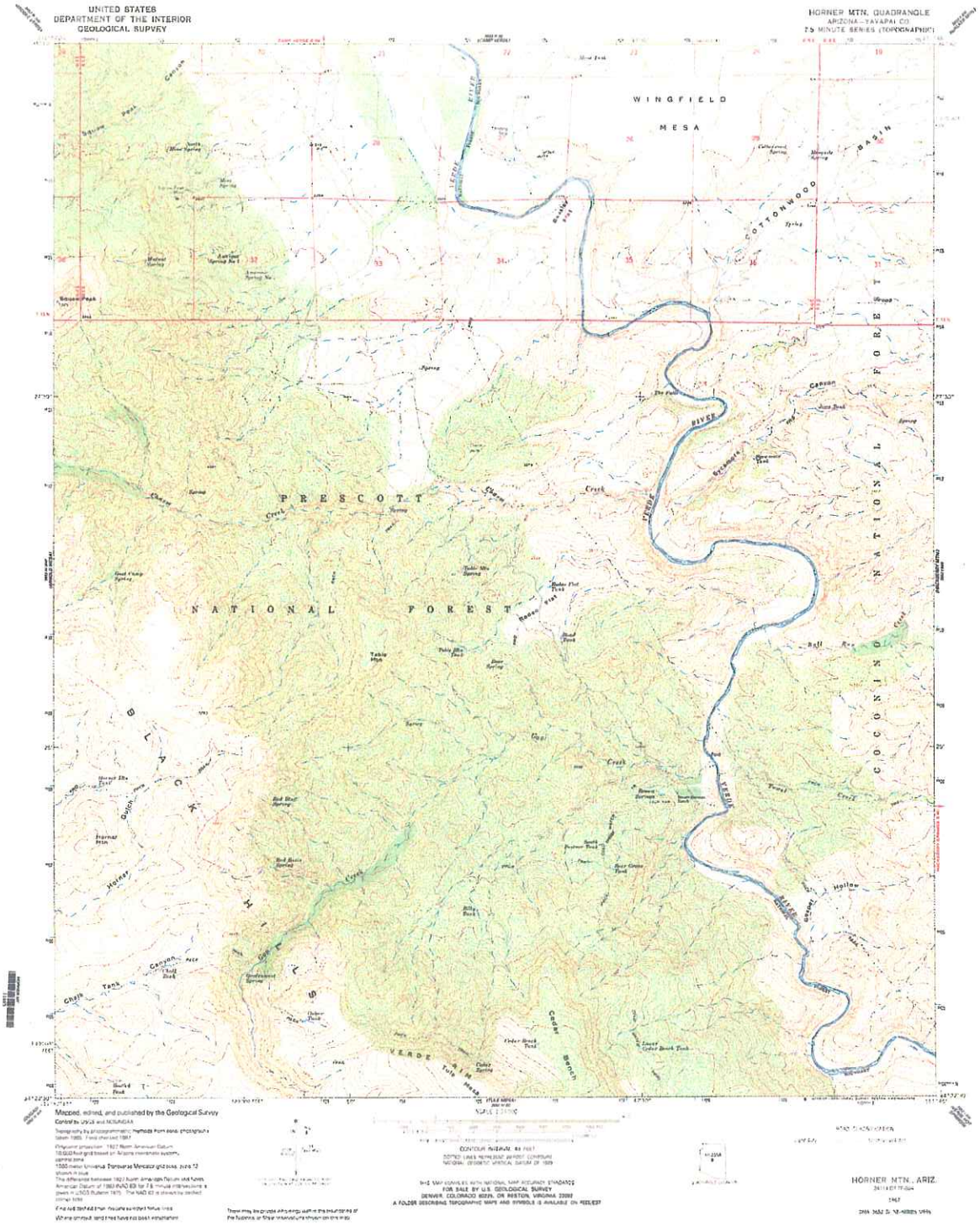

Figure 12. U.S. Geological Survey topographic map, Horner Mountain, Ariz., 1967

Figure 13. U.S. Geological Survey topographic map, Hackberry Mountain, Ariz., 1967

Figure 14. U.S. Geological Survey topographic map, Verde Hot Springs, Ariz., 1967

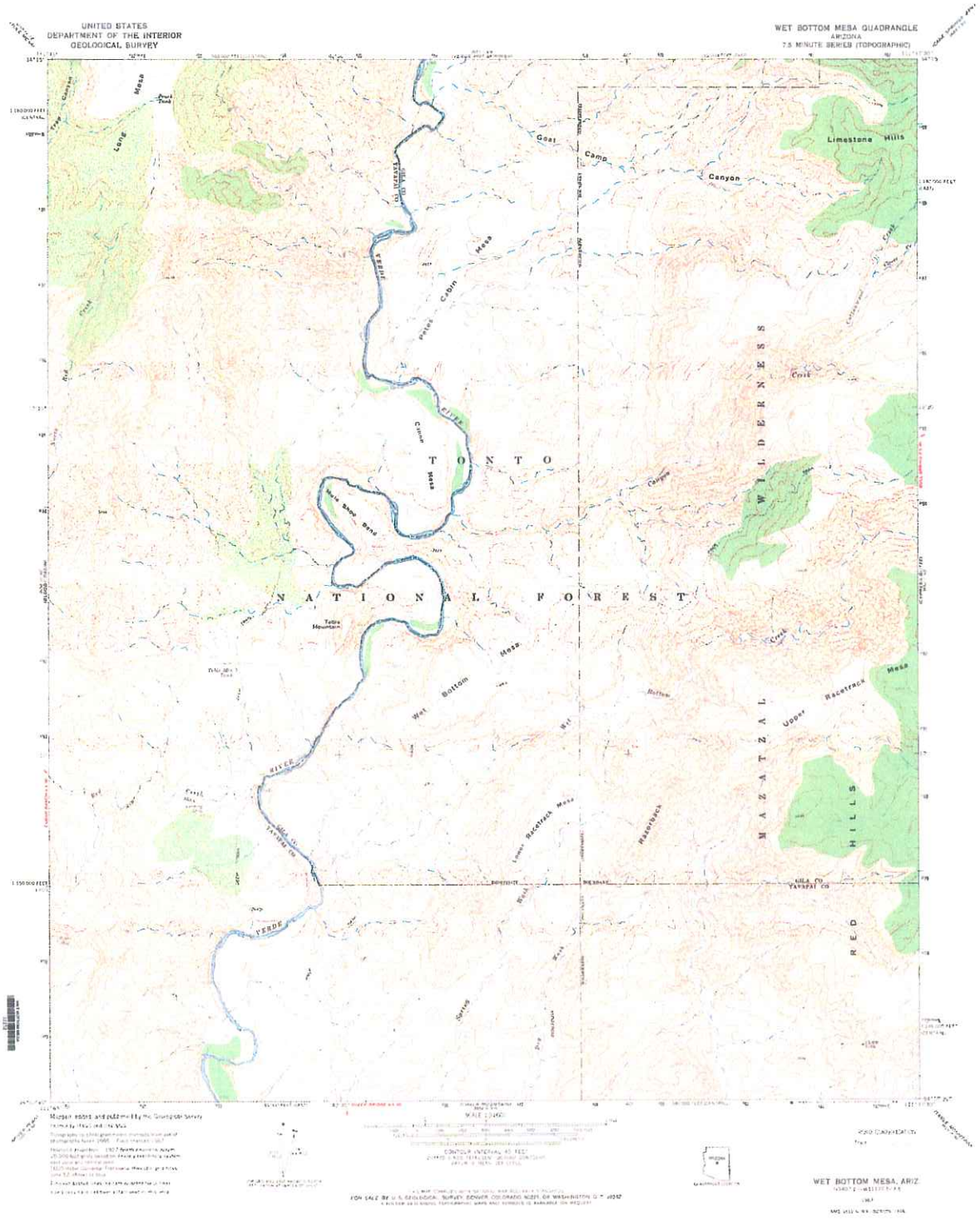

Figure 15. U.S. Geological Survey topographic map, Wet Bottom Mesa, Ariz., 1967

Figure 16. U.S. Geological Survey topographic map, Chalk Mountain, Ariz., 1967

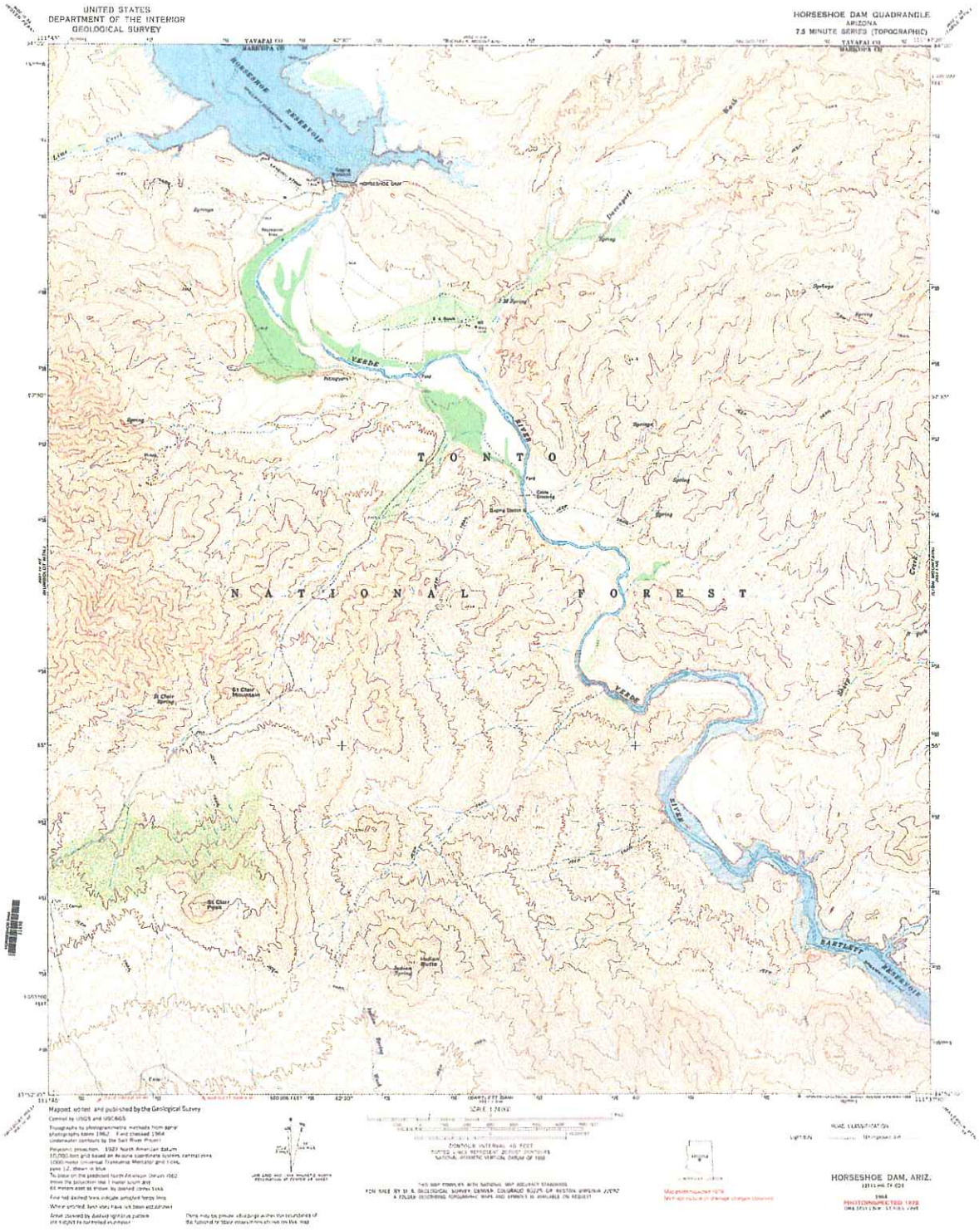

Figure 17. U.S. Geological Survey topographic map, Horseshoe Dam, Ariz., 1964

Figure 18. U.S. Geological Survey topographic map, Lion Mountain, Ariz., 1964

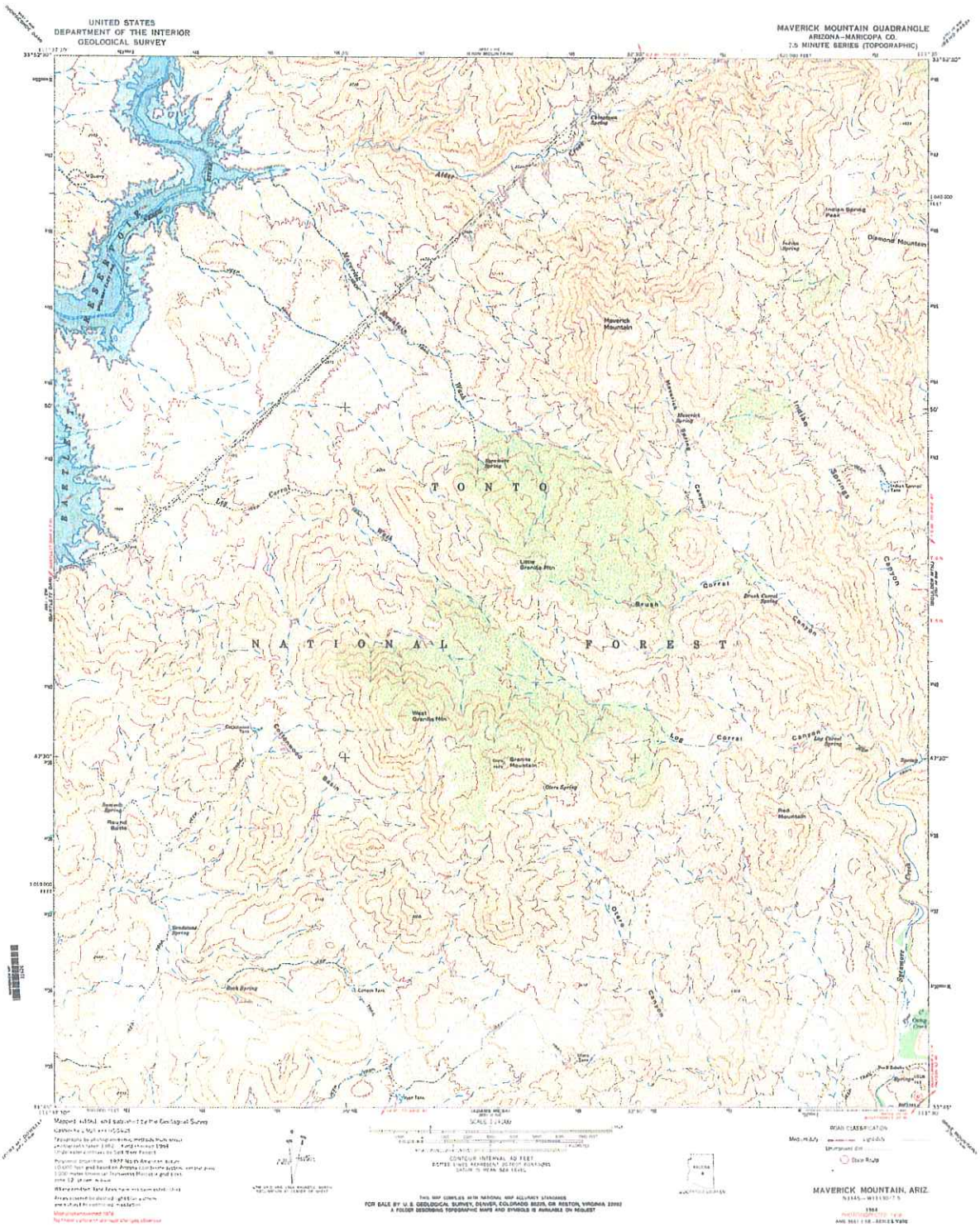

Figure 19. U.S. Geological Survey topographic map, Maverick Mountain, Ariz., 1964

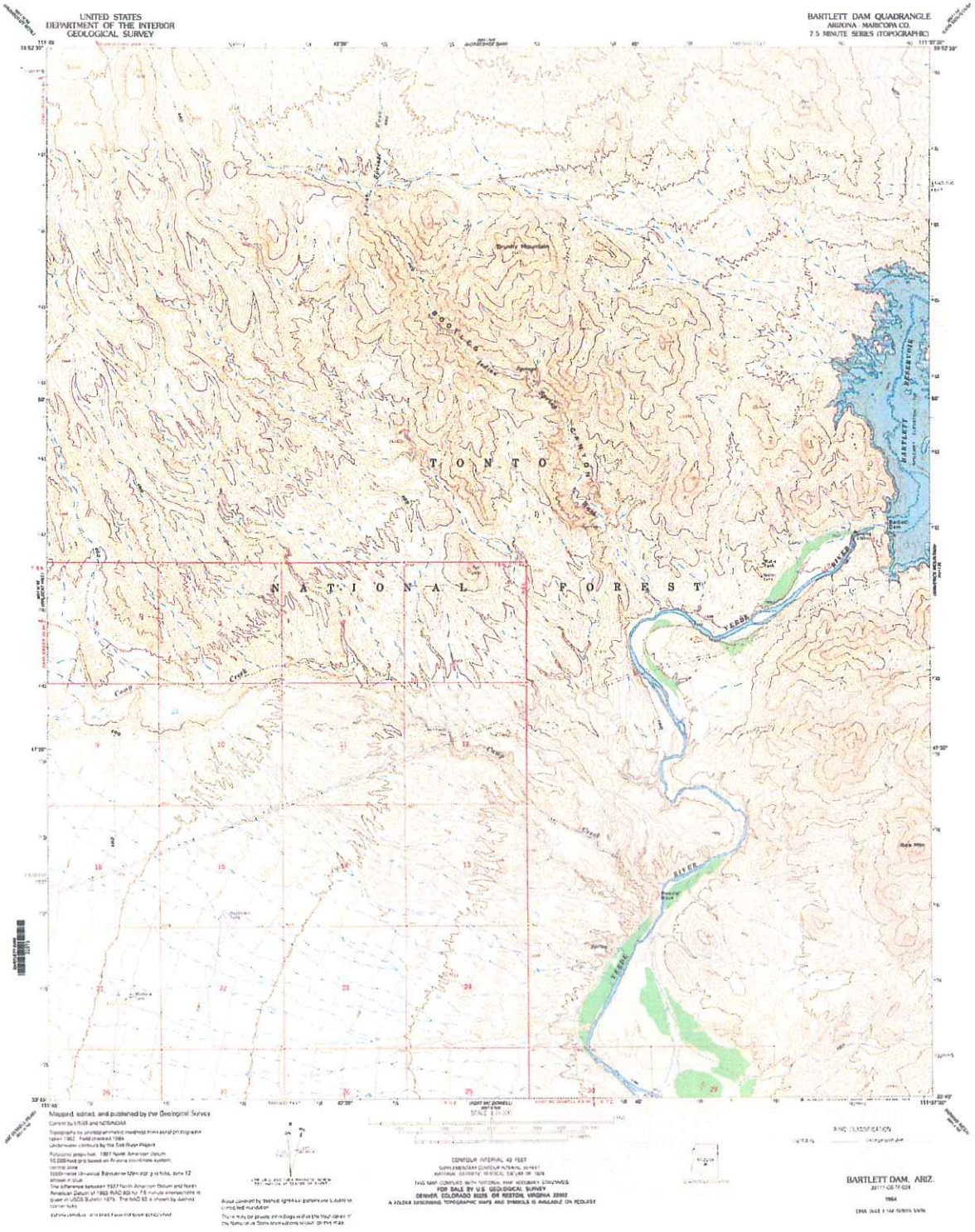

Figure 20. U.S. Geological Survey topographic map, Bartlett Dam, Ariz., 1964

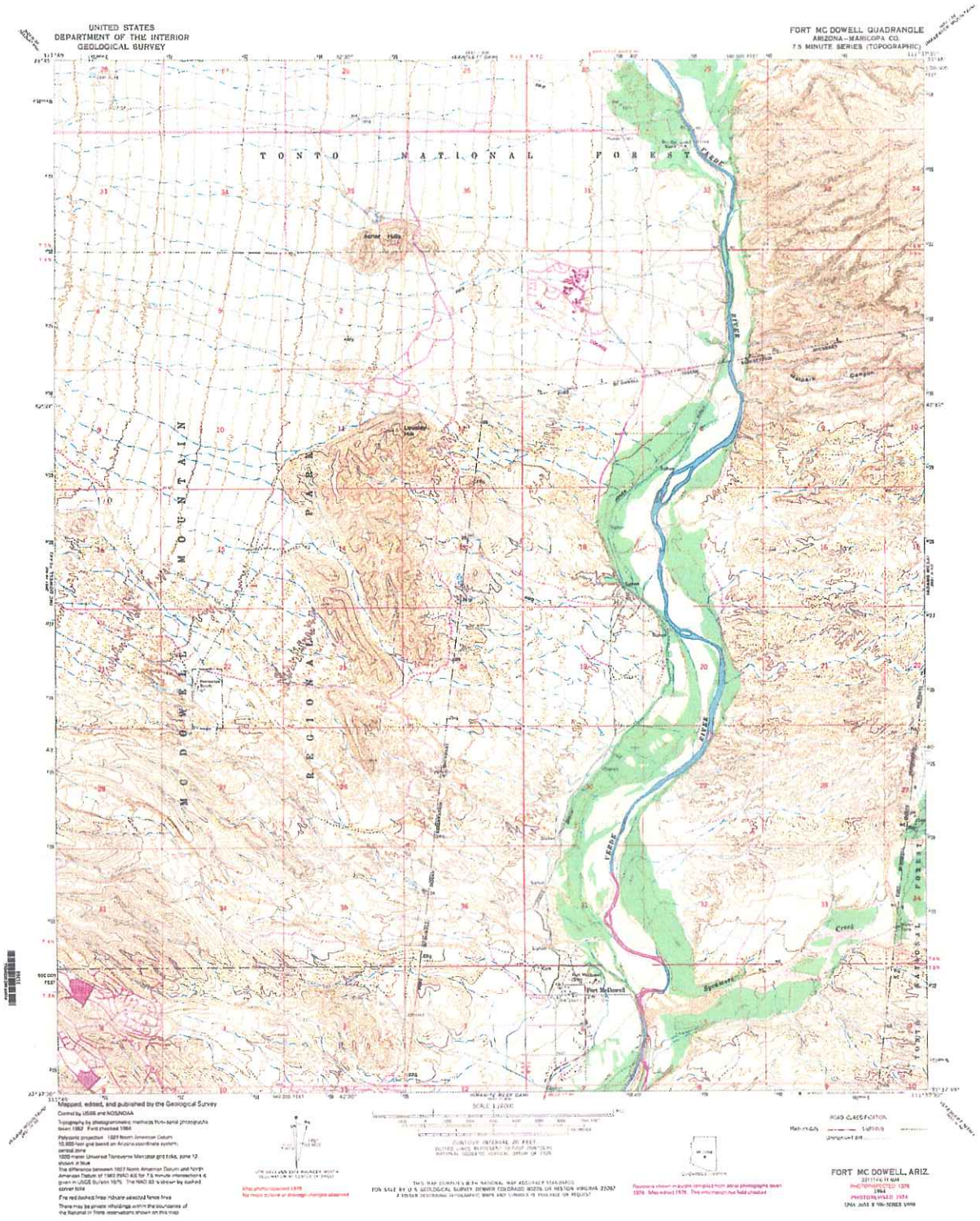

Figure 21. U.S. Geological Survey topographic map, Fort McDowell, Ariz., 1964, photo revised 1974

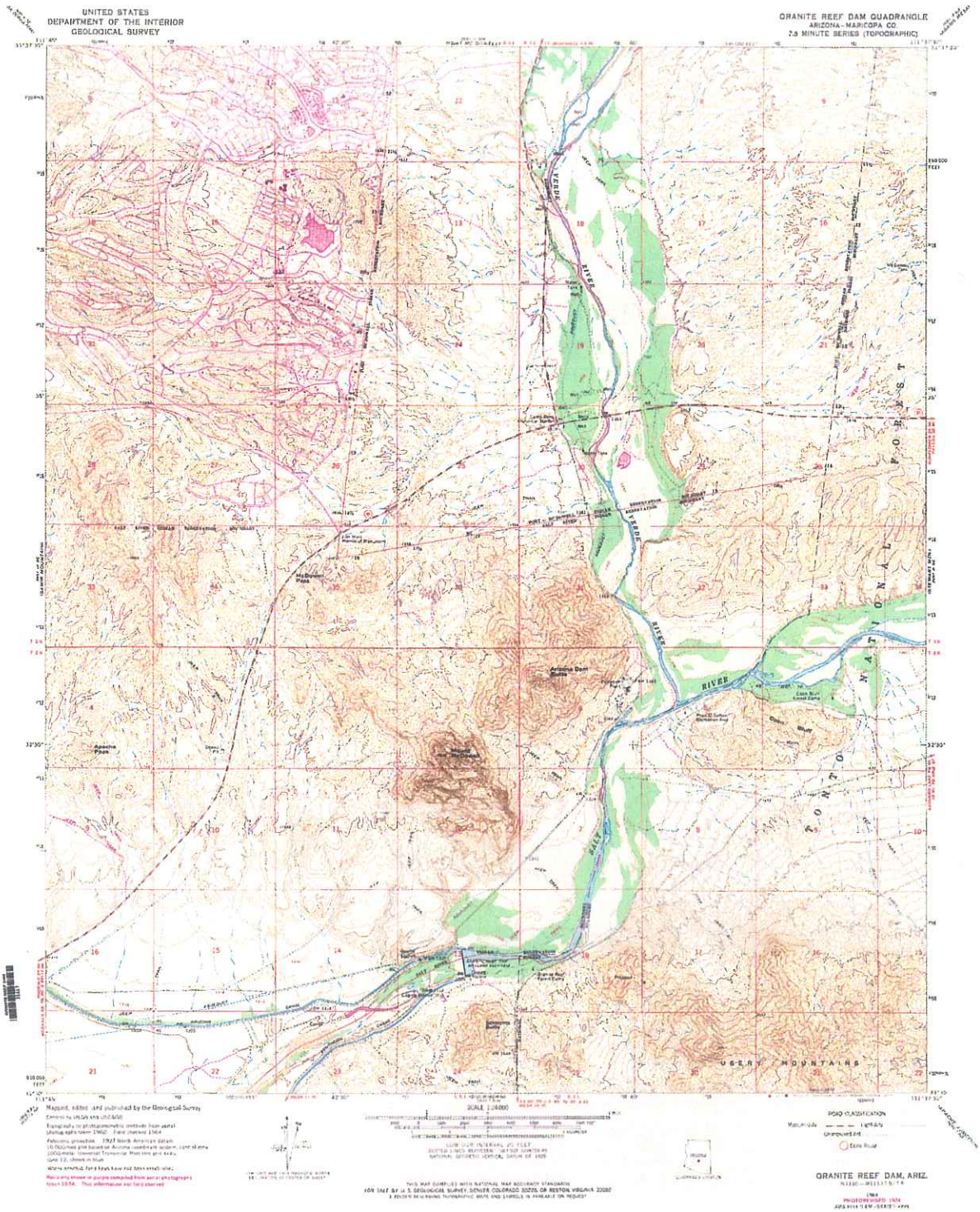

Figure 22. U.S. Geological Survey topographic map, Granite Reef Dam, Ariz., 1964, photo revised 1974

With exterior township and range lines established, U.S. Government surveyors subsequently divided each township into thirty-six sub-blocks called "sections," most of which were 640 acres, or one mile square. Due to the curvature of the earth and other factors, surveyors sometimes had to adjust slightly the sections along the western and northern edges of each township to be more or less than a square mile. The sections were numbered within each township in an "S" fashion beginning with the northeast square and heading west for sections one through six. Section seven then appeared immediately south of section six, and sections then went east through section twelve. The remaining sections were numbered in the same "S" fashion until section thirty-six was reached in the southeastern most part of the township.

Surveyors laying out the township, range, and section lines were provided with very precise instructions for measuring these lines because accuracy was critical for these lands to be transferred out of the public domain in a reliable manner. In addition, for those areas remaining in the public domain, the precise rules for surveying and for noting the characteristics of the land gave the U.S. Government an extremely valuable record of what it owned through the field notes that surveyors were required to make. The field notes were to include any notable features of the land such as streams, rivers, lakes, roads, irrigation ditches, or other prominent landmarks and general topography. Using their field notes, surveyors were then to draw and forward original survey maps to the Surveyor General of the respective state or territory along with the accompanying field notes for final approval.

The 1851 *Instructions to the Surveyor General of Oregon* contained several provisions that are relevant to navigable bodies of water and therefore are important in relation to any consideration of the Verde River's navigability or non-navigability. First, the instructions provided that when surveyors encountered "impassable obstacles, such as ponds, swamps,

marshes, lakes, rivers, creeks, &c.," they were to extend the survey line from the opposite side of the obstacle using triangulation or other surveying techniques. In addition, the surveyors were to "state all the particulars in relation thereto in your field book." Moreover, the directions continued,

> at the intersection of lines with both margins of impassable obstacles, you will establish a Witness Point, (for the purpose of perpetuating the intersections therewith) by setting a post, and giving in your field book the course and distance therefrom, to two trees on opposite sides of the line, each of which trees you will mark with a blaze and notch facing the post; but on the margins of navigable water courses, or navigable lakes, you will mark the trees with the proper number of the fractional section, township, and range.[5]

The *Instructions to the Surveyor General of Oregon* also provided that when surveyors encountered navigable bodies of water, special survey markers called "meander corner posts" were to be "planted at all those points where the township or section lines intersect the banks of such rivers, bayous, lakes, or islands, as are by law directed to be meandered."[6] (Congress first passed legislation establishing that navigable waterways remain public highways in 1796 – a statute that led to the requirement that navigable rivers and lakes be meandered by federal surveyors – but that law did not specify what constituted navigability.)[7] Therefore, where township, range, section, or fractional section lines encountered bodies of water, witness posts were to be established if those watercourses were *not* navigable, but meander corner posts were to be placed where the lines intersected navigable bodies of water. As the instructions explained, surveyors were to note:

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[5] *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 438.

[6] *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 439. On the federal legislation mandating meanders of navigable bodies of water, see White, *A History of the Rectangular Survey System*, p. 30.

[7] *An Act Providing for the Sale of the Lands of the United States in the Territory Northwest of the River Ohio, and above the Mouth of Kentucky River*, 1 Stat. 464 (1796). The 1796 legislation is now codified at 43 U.S.C. 931.

> [i]ntersections by line of *water objects*. All rivers, creeks, and smaller streams of water which the [survey] line crosses; the distance on line at the [witness] points of intersection, and their *widths on line*." [Emphases in original.]

Surveying lines that intersected navigable bodies of water were to be conducted as follows:

> In cases of *navigable streams*, their width will be ascertained between *meander corners*, as set forth under the proper heading. [Emphases in original.][8]

Aside from these general directions, surveyors also were given precise instructions for measuring the sinuosities of navigable bodies of water, including rivers, streams, lakes, ponds, or bayous. Between the meander corner posts, the edges of the banks were to be measured going downstream by recording degree bearings. The details of this meander surveying were to be recorded in the surveyor's field book as a separate set of records from the surveys of township, range, and section lines.[9]

Finally, as if these instructions were not specific enough, the 1851 *Instructions to the Surveyor General of Oregon* contained detailed examples of surveying notes so that field surveyors would understand virtually any type of circumstance they might encounter.[10]

2. The 1855 *Manual*

Between 1851 and 1864, the U.S. General Land Office published only one revised version of the 1851 work. The 1855 *Manual* (bearing the lengthy title *Instructions to the Surveyors General of Public Lands of the United States, for Those Surveying Districts Established in and Since the Year 1850; Containing Also, A Manual of Instructions to Regulate*

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[8] *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 444.

[9] *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 442.

[10] C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), passim.

the Field Operations of Deputy Surveyors, Illustrated by Diagrams) contained more detail than the 1851 instructions. Nevertheless, it remained virtually identical in substance with regard to recording navigable and non-navigable bodies of water.[11]

3. The 1864 *Instructions*

Nine years after the 1855 *Manual* had appeared, the U.S. General Land Office began to modify its instructions for how surveyors dealt with navigable and non-navigable bodies of water. In 1864, the 1855 surveyors' *Manual* was amended by *Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations of Deputy Surveyors*. Because surveys in Arizona began in 1868, it was this set of directions that governed how bodies of water in Arizona Territory were recorded.

The 1864 revision made no changes to the section of the 1855 *Manual* that dealt with "insuperable objects on line." In fact, the 1864 amendments did not discuss these directions at all, presumably leaving this part of the 1855 *Manual* intact.

Regarding meanders and navigable streams, the 1864 amendments added some important criteria to which streams would be meandered:

> Rivers not embraced in the class denominated "navigable" under the statute, but which are well-defined natural arteries of internal communication, and have a uniform width, will be meandered on *one bank*. [Emphasis added.]

The 1864 *Instructions* added that for the sake of consistency, one-bank meanders were to be run on the right side (looking downstream) unless obstacles made it necessary to switch to the left

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[11] For the 1855 discussion of how bodies of water were to be recorded, see *Instructions to the Surveyors General of Public Lands of the United States, for Those Surveying Districts Established in and Since the Year 1850; Containing Also, A Manual of Instructions to Regulate the Field Operations of Deputy Surveyors, Illustrated by Diagrams* (1855), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 458, 461, 464-465.

bank. If a change to the left were made, it was to be at a point where a survey line crossed the stream and was to be recorded in the field notes.[12]

4. The 1881 *Instructions*

On May 3, 1881, the U.S. General Land Office once again updated its directions to federal surveyors by issuing *Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims*. In this manual, much of the directions remained the same as in the 1855 *Manual* as amended in 1864, including, for example, how surveyors were to establish witness posts at intersections with non-navigable "insuperable objects on line." Here, as in 1851 and 1855, the manual told surveyors to use triangulation to establish the distance across non-navigable obstacles on line. Also as in the 1851 and 1855 books, surveyors were to set a witness post on the line on each side of obstacle, and they were to measure to two trees on opposite sides of the line for each post. Each tree was to be marked with a notch and blaze facing the post, and the degree bearing and distance from the trees to their respective witness posts on line were to be noted in the field notes.[13]

For navigable bodies of water, as had been the case in the 1851 and 1855 *Manuals* (as amended in 1864), the surveyors were told that "on the margins of navigable water-courses, or navigable lakes, you will mark the trees with the proper number of the fractional section, township and range." And similar to the 1851 and 1855 instructions, the 1881 directions provided that "[m]eander corners are established at all those points where the lines of the public

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[12] *Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations of Deputy Surveyors* (1864), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 504.

[13] *Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims* (1881), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 516.

surveys intersect the banks of such rivers, bayous, lakes, or islands as are by law directed to be meandered."[14]

In terms of how meanders were to be carried out, the 1881 *Instructions* repeated the information from the 1855 *Manual* as well as the 1864 addition that rivers that were not navigable "under the statute" but that were "well-defined natural arteries of internal communication" were to be meandered on one bank only. The balance of the instructions for meandering was also drawn from either the 1855 instructions or the 1864 amendments.[15]

5. The 1890 *Manual*

Nine more years elapsed before the U.S. General Land Office revised its surveying instructions. On January 1, 1890, the agency issued its *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims*. Many of the surveying instructions were identical or nearly identical to the previous work, including those for recording major obstacles. For example, the 1890 instructions about how to chronicle "insuperable objects on line" continued to provide that surveyors were to use triangulation to measure across the obstruction. Surveyors were still also instructed to set a witness post on line at the edge of the non-navigable obstacle, and to give the course and direction to two nearby trees on opposite sides of the line, each of which were to be notched and marked with a blaze facing the witness post. And, as had been the case in the 1855, 1864, and 1881 directives, the 1890 directions also stated that for navigable bodies of water, meander posts were to be set

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[14] *Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims* (1881), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 516-517.

[15] *Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims* (1881), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 523-524.

where lines intersected these obstacles, and meanders were to be run following the course of the river.[16]

A significant change had been made to the instructions for what bodies of water were to be meandered, however. Whereas in 1881, surveyors were to meander navigable streams (both sides) and any non-navigable body of water used for "internal communication" (on one side only), the 1890 *Manual* deleted the instructions to meander non-navigable bodies of water that were used for "internal communication." In addition, the 1890 *Manual* no longer told surveyors to meander streams that were considered navigable, as the 1881 *Instructions* had provided "under the statute." Instead, the 1890 *Manual* stated:

> Both banks of *navigable* rivers, as well as of all rivers not embraced in the class denominated as "navigable," the right angle width of which is *three chains* and upwards, will be meandered on *both* banks by taking the general courses and distances of their sinuosities, and the same are to be entered in the field book. Rivers not classed as navigable will not be meandered above the point where the average right-angle width is less than three chains. [Emphases in original.][17]

In short, there had been two significant changes regarding what bodies of water should be meandered. The first was that meanders were to be done of waterways "as are by law directed to be meandered" (1881) or "embraced in the class denominated as 'navigable'" (1890). The second change as to what was to be meandered involved non-navigable streams. This change involved bodies of water used for "internal communication" (1881), where one bank was to be meandered, or streams more than three chains wide (1890), where both banks were to be meandered).

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[16] *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1890), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 560. In surveying, one chain equals 100 links or 66 feet.

[17] *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1890), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 568.

6. The 1894 *Manual*

On June 30, 1894, the U.S. General Land Office issued its *1894 Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims*. In relation to directions for meandering, the 1894 *Manual* had major changes in what bodies of water were to be meandered. The new instructions still called for bodies of water "embraced in the class denominated 'navigable'" to be meandered. In addition, as had been the case in the 1890 *Manual*, all non-navigable bodies of water that were more than three chains wide were to be meandered, but here the 1894 *Manual* added another instruction. Both navigable and non-navigable streams (more than three chains wide) were to be meandered "at the ordinary *mean high water mark*" (emphasis in original), and their general courses and sinuosities were to be recorded in the appropriate field notebook. Furthermore, in another significant change, the 1894 *Manual* provided that "[s]hallow streams, without any well-defined channel or permanent banks *will not be meandered*; except tide-water steams, whether more or less than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends." (Emphasis in original.)[18]

7. The 1902 *Manual*

Shortly after the turn of the century, the U.S. General Land Office once again revised its surveying handbook, releasing *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* on January 1, 1902. There were significant differences between the 1902 *Manual* and its 1894 predecessor regarding meandering. First, the 1902 *Manual* observed that the term "meander" had frequently been misapplied in the past by

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[18] *1894 Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1894), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 621.

surveyors, which had important implications for lands adjoining the meander lines. The 1902 *Manual* stated:

> The running of meander lines has always been authorized in the survey of public lands fronting on large streams and other bodies of water, but does not appear to have been proper in other cases. The mere fact that an irregular or sinuous line must be run, *as in the case of a reservation boundary*, does not entitle it to be called a meander line except where it closely follows a stream or lake shore. The legal riparian rights connected with meandered lines do not apply in case of other irregular lines, as the latter are strict boundaries. [Emphasis added.][19]

What the 1902 M*anual* meant was that the beds and banks of bodies of water that were navigable (and thus meandered) were held by the states whereas the beds and banks of non-navigable bodies of water were held by the adjoining riparian land owners. Therefore, meander lines needed to be clearly identified and had to be distinct from other irregular survey lines, such as those utilized for marking the edges of Indian and other federal land reservations.

Regarding which bodies of water were to be meandered, the 1902 *Manual* had one addition to the 1894 instructions. The new direction provided that streams less than three chains wide were not to be meandered:

> except that streams which are less than three chains wide and which are so deep, swift and dangerous as to be impassable through the agricultural season, may be meandered, where good agricultural lands along the shores require their separation into fractional lots for the benefit of settlers. But such meander surveys shall be subject to rejection if proved unnecessary by field inspection.[20]

The 1902 *Manual* also retained the instruction that shallow streams "without any well-defined channel or permanent banks, will not be meandered; except tide-water streams, whether

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[19] *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1902), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 717.

[20] *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1902), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 718.

more or less than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends."[21]

B. SUMMARY AND CONCLUSIONS REGARDING SURVEYORS' MANUALS AND MEANDERING

In short, by the time Arizona entered the Union on February 14, 1912, there had been substantial revisions and alterations to the instructions to federal surveyors concerning how they were to mark and record the intersection of survey lines with non-navigable and navigable bodies of water. Although initially, only navigable bodies of water were to be meandered, that direction had been expanded over the years to include some non-navigable bodies of water. In addition, as the 1902 instructions illustrated, surveyors also used the term "meander" (frequently incorrectly) to identify irregular survey lines along reservation boundaries.

C. U.S. GOVERNMENT SURVEYS IN THE VERDE RIVER AREA

Prior to Arizona's statehood in 1912, various areas along the Verde River were surveyed – and in some cases resurveyed – both in relation to exterior township and range lines as well as for interior section and subsection lines. Because surveyors whose work involved marking only exterior lines generally did not have the responsibility to undertake meanders where necessary (unless their contracts covered both interior and exterior surveys, which was common), the field notes of the exterior surveys are of limited value to this report and will not be discussed here. Instead, the field notes of interior surveys and resulting plats will be examined in detail for information regarding surveyors' judgments and descriptions regarding the Verde River's navigability or non-navigability as well as the stream's general characteristics.

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[21] *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1902), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 718.

The interiors of the townships through which the Verde River flows between the stream's headwaters and the its confluence with the Salt River were surveyed originally over a wide range of years, most of which took place prior to statehood beginning in the early 1870s. Resurveys of some townships before statehood were done in 1909 and 1911. Because of the large number of different survey dates, cumulatively they were undertaken according to the instructions of many of the survey manuals discussed above. While there were at least eight federal surveyors who mapped the Verde between that stream's headwaters and the Salt River prior to 1912 and while those surveys were done under the instructions of different survey manuals, during varying seasons, and in a multitude of years, not one of the surveyors determined the stream to be navigable under the surveying instructions.

These initial federal surveys are significant in relation to establishing the nature of the Verde River, and for that reason, they will be reviewed in detail here. In general, the discussion will be in a down-river manner. Since surveyors compiled their notes in the field as surveys were undertaken and plats were later drawn based on the notes, the notes for each township survey will be discussed first followed by the corresponding plats. Although a few plats and notes were illegible, non-existent, or not available when this report was written, most of the pre-1912 field notes and plats for townships along the Verde above the Salt River have been examined for this study. Many townships, however, were surveyed either after 1912 or were never surveyed at all due to the difficulty of the terrain, inclusion within national forests, Reclamation Service withdrawals, hydroelectric power withdrawals, Indian reservations, or unsuitability for settlement (see the map reproduced in Part IV for details on these withdrawals).

Because of the length of the Verde River and since many adjacent township interior subdivision surveys were done by the same surveyor who applied the same standards and used

the same terminology to describe the stream in neighboring townships, only representative samples of the extant pre-1912 subdivision surveys will be discussed here. Nevertheless, the conclusions presented in this discussion of federal surveys and the nature of the Verde River are derived from many more surveys than are discussed here.

1. 1883 Subdivision Surveys and 1909 Resurveys of Townships 17 and 18 North, Range 1 West

One of the most upstream portions of the Verde River relevant to this report in relation to federal surveys lies in townships 17 and 18 north, range 1 west. (The Verde's headwaters at Sullivan Lake are in section 15 of township 17 north, range 2 west, south of Paulden, Arizona, but that township was not surveyed until 1956.) In September 1883, Joseph T. Smith surveyed the interior subdivision lines of townships 17 and 18 north, range 1 west. The letter from U.S. Surveyor General J.W. Robbins noting that Smith had received the surveying contract for this region specified that "You will faithfully comply with the instructions of the General Land Office of date May 3, 1881," and Robbins noted he had enclosed a copy of the 1881 *Instructions* for Smith's convenience.[22] These townships were also resurveyed by Alfred N. Oliver in May and June 1909 under his contract dated March 24, 1909, apparently because the original surveys were believed to be fraudulent.[23] The notes and plats of these surveys, which were done, respectively, under the directions issued in 1881 and 1902, confirm both surveyors' assessments of the Verde River being a non-navigable stream. No meander data appear in any of the notes,

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[22] U.S. Surveyor General J.W. Robbins to Joseph T. Smith, July 24, 1883, copy in file for Contract and Bond No. 42, Joseph T. Smith, July 24, 1883, box 3, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1871-1885, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[23] Contract and Bond No. 153, Alfred W. Oliver, March 24, 1909, box 10, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1907-1909, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. In relation to the issue of fraud being involved in the initial surveys, see "Special Instructions to Alfred N. Oliver, U.S. Deputy Surveyor, Under His Contract No. 153, Dated November 19, 1908," Nov. 12, 1908, under the heading "Subdivision of Townships 17, 18, 19, and 20 North, Range 1 West, General," ibid.

and none appear on the plats (see below for copies of those plats, which were approved by the Surveyor General respectively in 1884 and 1910).[24]

[24] J.T. Smith, "Field Notes of the Survey of the Subdivision Lines of Township 17 N. Range 1 W., Gila and Salt River Base and Meridian, Arizona," approved by the Surveyor General Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Smith, "Plat of Township 17 North, Range 1 West, Gila and Salt River Meridian," approved by the Surveyor General Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Smith, "Field Notes of the Survey of the Subdivision Lines of Township 18 N., Range 1 W., Gila and Salt River Base and Meridian, Arizona," approved by the Surveyor General Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Smith, "Plat of Township 18 North, Range 1 West, Gila and Salt River Meridian," approved by the Surveyor General Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Alfred N. Oliver, "Field Notes of the Survey of the Private Claim Lines and Resurvey of the Subdivision Lines of Tps. 17 N., Rg. 1 W. of the Gila and Salt Rive Meridian, Territory of Arizona," approved by the Surveyor General April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona; Oliver, "Plat of Township 17 North, Range 1 West," approved by the Surveyor General April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona; Alfred N. Oliver, "Field Notes of the Survey of the Private Claim Lines and Resurvey of the Subdivision Lines of Tp. 18 N., Rg. 1 W., of the Gila and Salt River Meridian, Territory of Arizona," approved by the Surveyor General April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona; Oliver, "Plat of Township 18 North, Range 1 West, Gila and Salt River Meridian, Arizona," approved by the Surveyor General April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona.

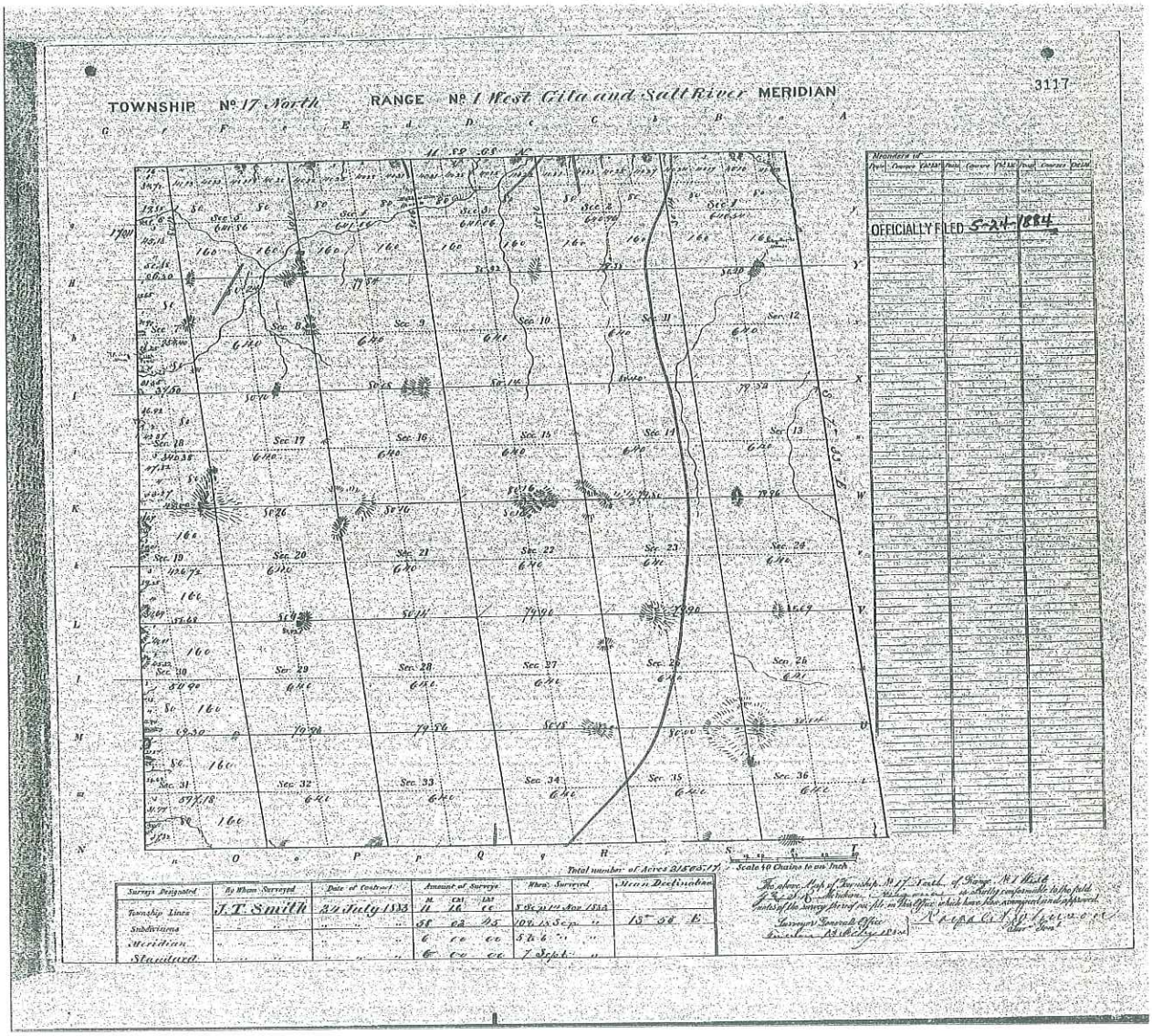

Figure 23. U.S. General Land Office Survey Plat of Township 17 North, Range 1 West (1884), U.S. Bureau of Land Management, Phoenix, Arizona

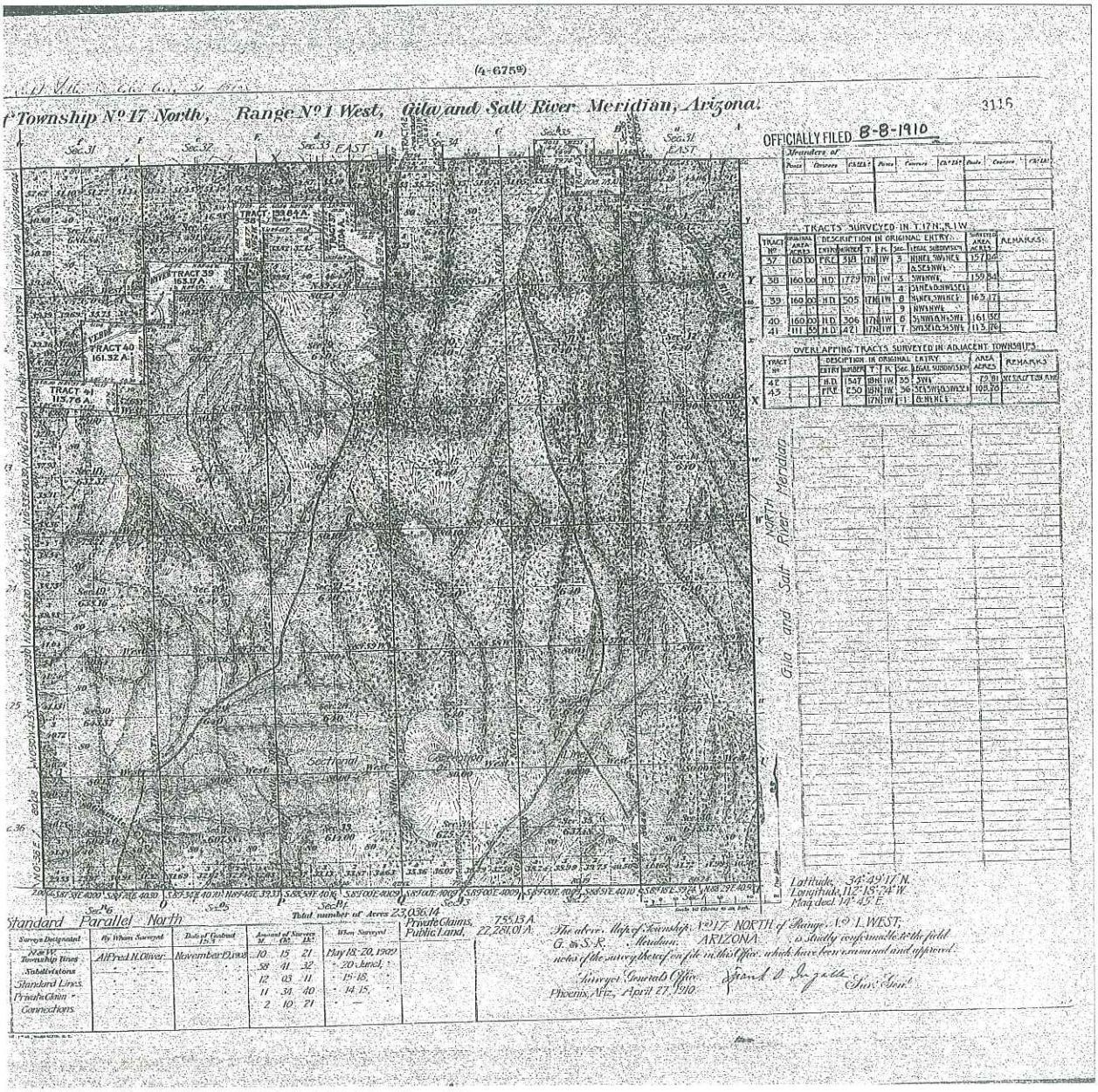

Figure 24. U.S. General Land Office Survey Plat of Township 17 North, Range 1 West (1910), U.S. Bureau of Land Management, Phoenix, Arizona

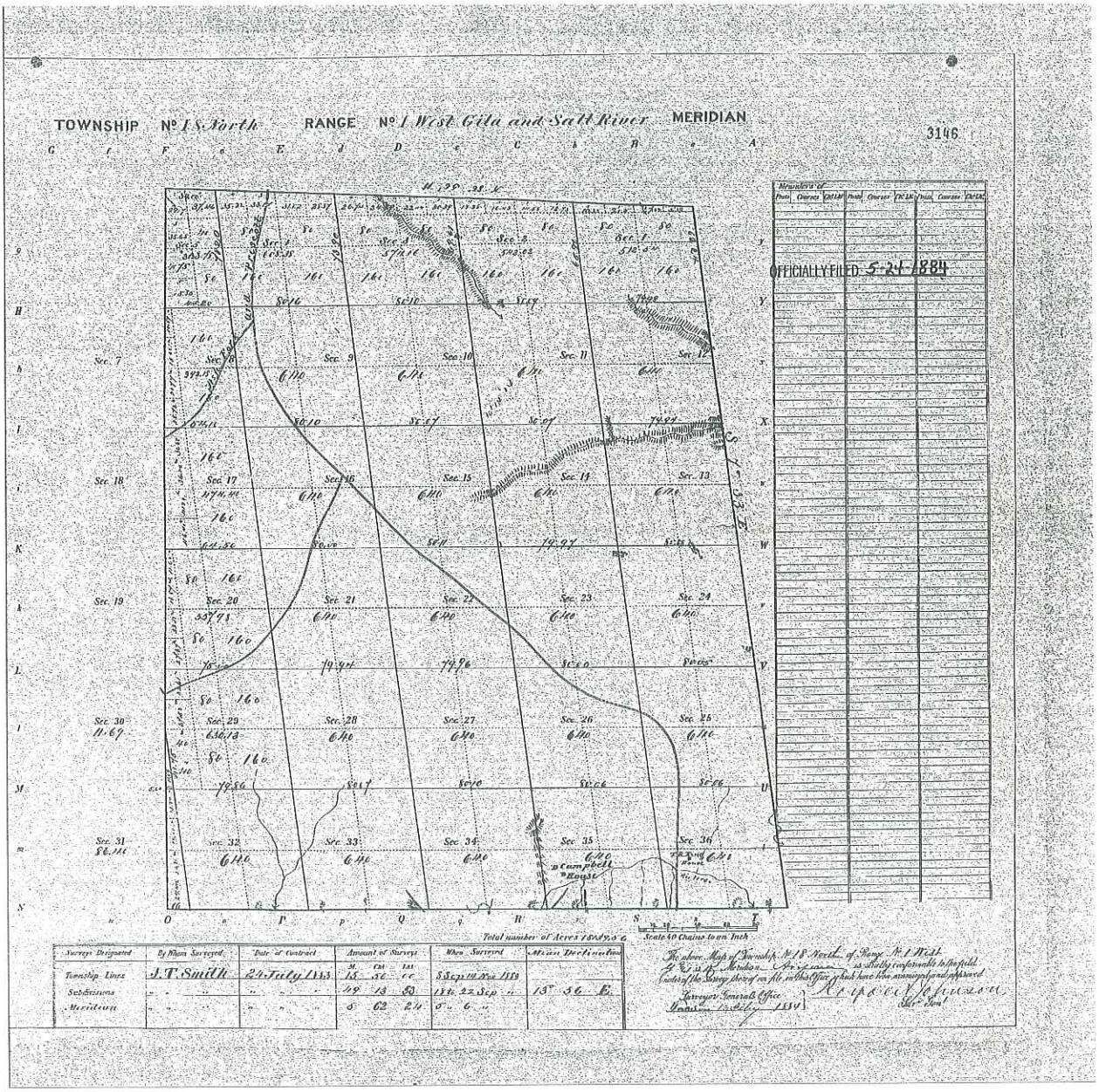

Figure 25. U.S. General Land Office Survey Plat of Township 18 North, Range 1 West (1884), U.S. Bureau of Land Management, Phoenix, Arizona

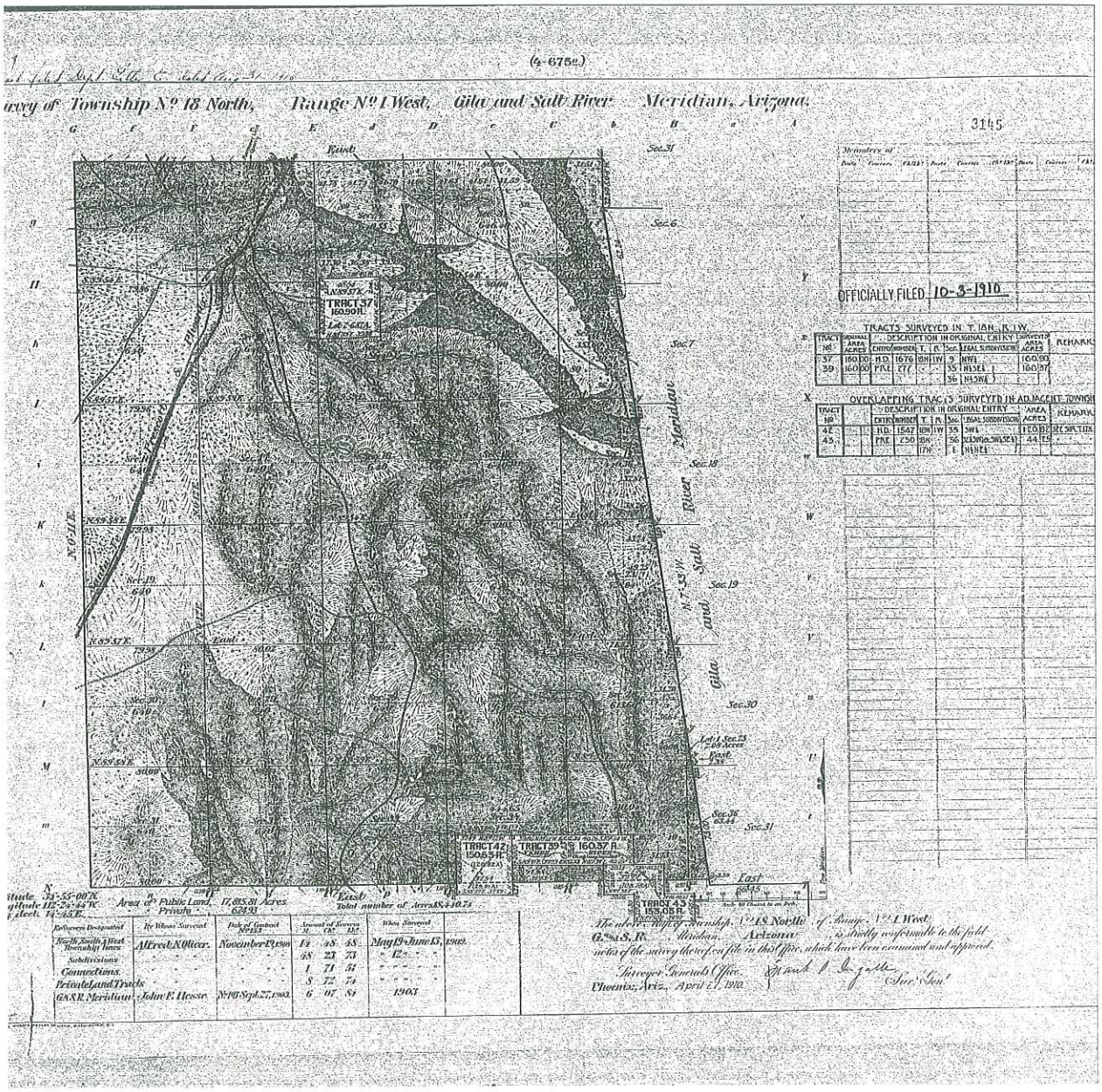

Figure 26. U.S. General Land Office Survey Plat of Township 18 North, Range 1 West (1910), U.S. Bureau of Land Management, Phoenix, Arizona

2. 1902 Subdivision Survey of Township 18 North, Range 1 East

Continuing downstream, between February 8 and 18, 1903, John F. Hesse surveyed the interior subdivision lines of township 18 north, range 1 east, under his contract dated January 21,

1903.[25] The Verde River ran through the southern portion of the township, but there is no indication that Hesse thought the stream was navigable. Hesse undertook no meanders of the stream, and at each encounter he simply measured the distance across and gave the stream's direction of flow. In general, the Verde was considerably smaller than three chains wide. Thus, his treatment of the stream was consistent with instructions in 1902 *Manual* – which his contract directed he follow – that bodies of water *not* be meandered if they were less than three chains in width or if they were non-navigable.[26] Similarly, no meander lines appear on the plat (approved by the Surveyor General in 1904 – see below); no meander data is recorded in the margin; and no surveyor is listed as having undertaken meander surveys.[27]

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[25] Contract and Bond No. 103, John F. Hesse, Jan. 21, 1903, box 8, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1902-1905, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[26] John F. Hesse, "Field Notes of the Survey of the Subdivision Lines of Township 18 North, Range 1 East, of the Gila and Salt River Base and Meridian in the Territory of Arizona," pp. pp. 1H, 20, 40, vol. R234; pp. 78, 80, vol. R235, approved by the Surveyor General April 23, 1904, U.S. Bureau of Land Management, Phoenix, Arizona; Contract and Bond No. 103, John F. Hesse, Jan. 21, 1903, box 8, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1902-1905, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[27] John F. Hesse, "Plat of Township 18 North, Range 1 East, Gila and Salt River Meridian, Arizona," approved by the Surveyor General April 23, 1904, U.S. Bureau of Land Management, Phoenix, Arizona.

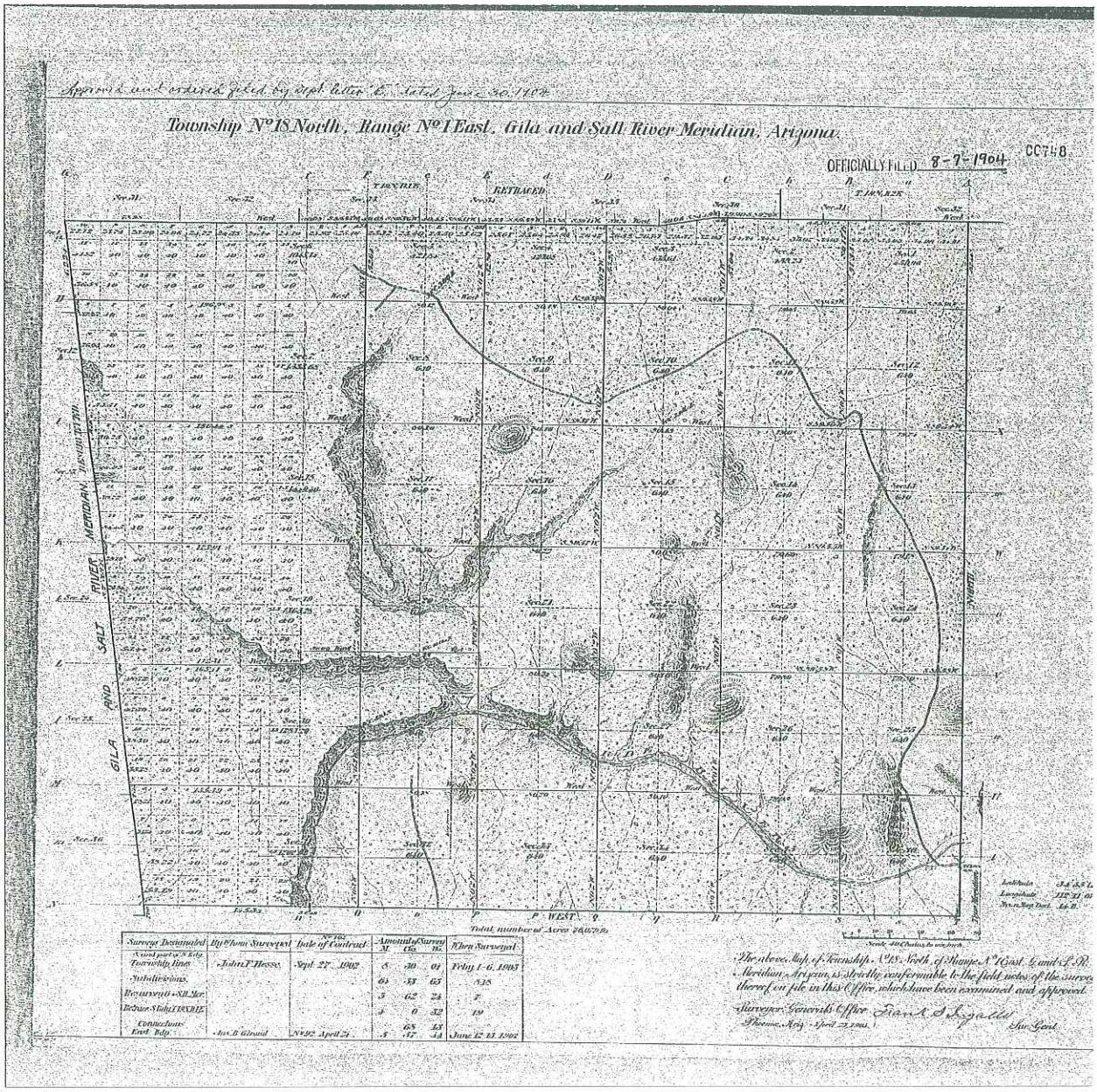

Figure 27. U.S. General Land Office Survey Plat of Township 18 North, Range 1 East (1904), U.S. Bureau of Land Management, Phoenix, Arizona

3. 1902 Subdivision Survey of Township 18 North, Range 2 East

The next relevant township to this study is township 18 north, range 2 east. This township was surveyed by James B. Girand in the summer of 1902. The Verde River flowed

through the southwest corner and crossed just the line between sections 31 and 32 before exiting on the southern edge of the township. When Girand encountered the Verde River on this line, his field notes suggest he believed it to be non-navigable. Not only did Girand not establish meander corners, but due to the difficulty of the terrain, he had to improvise in order to estimate the distance across the stream as being eighty links (4/5 of a chain) wide. Although Girand's survey contract was dated June 2, 1902 – only six months after the new 1902 *Manual* of surveying instructions had been released – the contract instructed him to rely on the previous 1894 *Manual* for details on carrying out his work.[28] Regardless of which manual was in effect, however, Girand would have been required to establish meander corners for navigable bodies of water as well as non-navigable streams over three chains wide. Therefore, his failure to establish meander corners indicated that he believed the stream to be a non-navigable watercourse less than three chains wide. Moreover, Girand did not bill the General Land Office for time or expenses associated with running meander lines. His only comment about the river in the general description of the township was to observe: "The S.W. portion of this township is well watered [by] the Verde River running through it, and the water is clear and pure."[29]

Girand's plat of the township (approved by the Surveyor General in 1903 – see below) likewise carried no suggestion that he believed the Verde was navigable. Not only do no meander lines appear along the river, but there is no listing for a surveyor who had done any

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[28] Contract and Bond No. 92, James B. Girand, June 30, 1902, box 7, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1901-1902, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[29] Quotation is in James B. Girand, "Field Notes of the Survey of the Subdivision Lines of Township No. 18 North, Range No. 2 East, of the Gila and Salt River Base and Meridian in the Territory of Arizona," pp. 19, 46-47, vol. R237, U.S. Bureau of Land Management, Phoenix, Arizona. See also Account of James B. Girand, U.S. Deputy Surveyor, for Surveys Executed under His Contract Dated April 24, 1902, copy in Contract and Bond No. 92, James B. Girand, June 30, 1902, box 7, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1901-1902, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

meanders. Furthermore, in the right margin in a table entitled "Meanders of," there is no meander data entered there.[30]

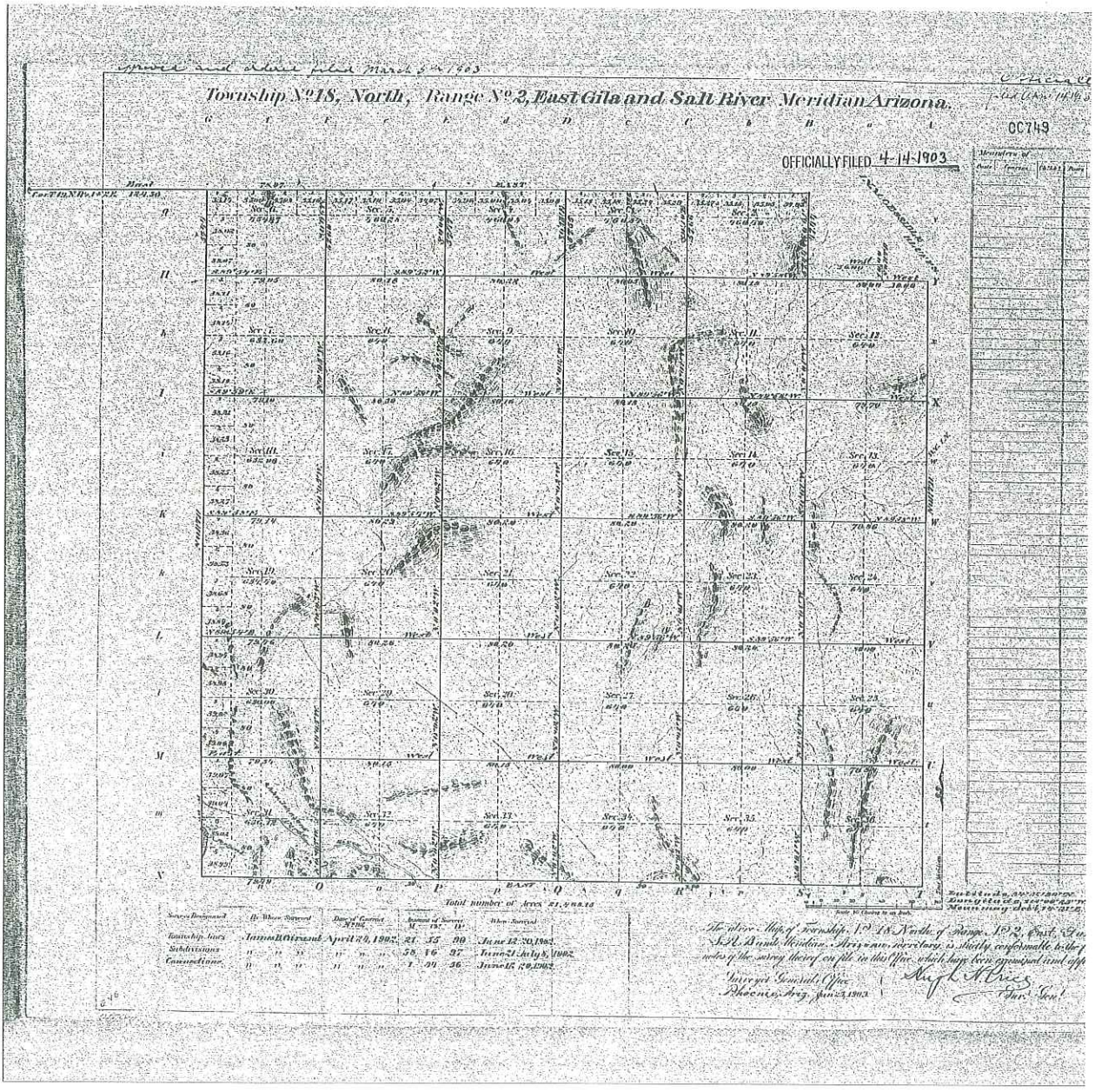

Figure 28. U.S. General Land Office Survey Plat of Township 18 North, Range 2 East (1903), U.S. Bureau of Land Management, Phoenix, Arizona

[30] James B. Girand, "Plat of Township 18 North, Range 2 East, Gila and Salt River Meridian, Arizona," approved by the Surveyor General on Jan. 23, 1903, U.S. Bureau of Land Management, Phoenix, Arizona.

4. 1907 and 1908 Subdivision Survey of Township 17 North, Range 3 East

Because the interior subdivision lines to township 17 north, range 2 east (the next township downstream on the Verde River) were not surveyed until 1956, the next relevant township to this study is township 17 north, range 3 east. Between December 16 and 20, 1907, and approximately a year later, Jesse B. Wright undertook the first survey of part of the interior subdivision lines of township 17 north, range 3 east. The manual that directed how Wright was to carry out his survey was the 1902 edition, which instructed surveyors to meander navigable bodies of water as well as non-navigable watercourses that were more than three chains wide. Nevertheless, Wright undertook no meanders of the Verde in this township, indicating both that he did not consider the stream to be navigable as well as the fact that in most of the places he encountered the Verde River, that stream was smaller than three chains wide.[31]

Wright's general description of the township included this commentary on the Verde River:

> The soil along the Verde river is very fertile, and there is much valuable land lying within the surveyed section, which could be irrigated, from the ample supply of water in the Verde river. The western portion of the Tp. is very rough, broken by deep canons and gulches leading to the Verde river, as is also the northeastern portion of Tp.[32]

Not only did Wright's field notes suggest the Verde River to be non-navigable, but so too did the plat of the township (approved in 1910 – see below). No meander lines appear along the Verde's banks, and in a table on the right margin of the plat labeled "Meanders of," no meander data were entered. Furthermore, in a table at the bottom of the plat identifying which parts of the

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[31] Jesse B. Wright, "Field Notes of the Partial Subdivision of T. 17 N. R. 3 E. of the G. & S.R.B. & Meridian, Arizona," pp. 5, 6, 8, vol. R2145, approved by the Surveyor General on Sept. 16, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

[32] Jesse B. Wright, "Field Notes of the Partial Subdivision of T. 17 N. R. 3 E. of the G. & S.R.B. & Meridian, Arizona," p. 9, vol. R2145, approved by the Surveyor General on Sept. 16, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

interior subdivision, exterior lines, and meanders were undertaken by various surveyors, no one is identified as having done meander surveys. Finally, also suggesting that the Verde River was not used for transportation is the presence of a road roughly paralleling the river.[33] The road presumably carried whatever transportation there may have been in the area.

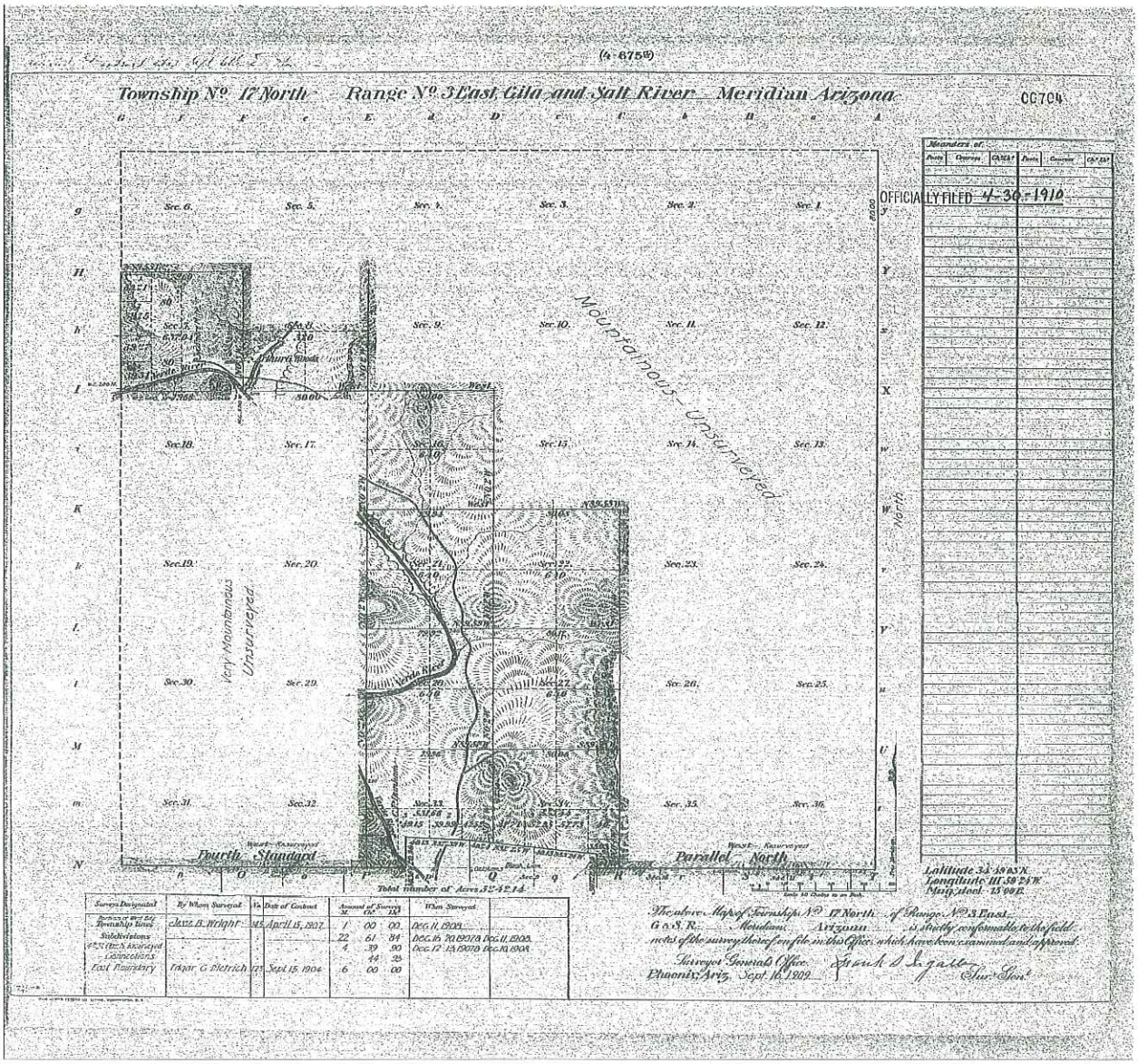

Figure 29. U.S. General Land Office Survey Plat of Township 17 North, Range 3 East (1910), U.S. Bureau of Land Management, Phoenix, Arizona

[33] Jesse B. Wright, "Plat of Township 17 North, Range 3 East, Gila and Salt River Meridian, Arizona," approved by the Surveyor General on Sept. 16, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

5. 1877 Subdivision Surveys of Townships 15-16 North, Range 3 East; 1877 Subdivision Surveys of Townships 14-15 North, Range 4 East; 1873 Subdivision Survey of Township 13 North, Range 5 East

The next area relevant to this survey study is township 13 north, range 5 east, the area near present-day Camp Verde. Part of this township, including a portion of Camp Verde Military Reservation (today, Fort Verde State Historic Park), was surveyed in late 1873 by C. Burton Foster. (Part of this township was also surveyed by Daniel Drummond in 1892 and 1893 and will be discussed below.) Foster's August 5, 1873, surveying contract directed that:

> agreeably with the laws of the United States, and *in strict conformity with the printed Manual of Surveying Instructions issued by the General Land Office*, which is hereby incorporated with and made a part of this contract, and with such Special Instructions as he may receive from the Surveyor General in conformity therewith, will well, truly, and faithfully run, measure and mark all the lines necessary to survey and establish the following lines, to wit:
>
> From such corners as is most convenient, on the east boundaries of the townships 13 & 14 N. range 1 East, extend a line as directly eastward as practicable to the vicinity of the cultivated lands in the Verde valley, and thence survey exterior and section lines of townships covering the settlements there[.] [Emphasis added.][34]

Under these instructions (which, notably, included by reference the provisions of the 1864 manual, *Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations of Deputy Surveyors*) Foster also carried out subdivision surveys of parts of townships 14-15 north, range 4 east, and townships 15-16 north, range 3 east – other areas of significant settlement in the Verde Valley.[35] Because Foster's treatment and descriptions of the Verde River were comparable in all of these surveys, only his work in township 13 north, range 5 east, will be discussed here.

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[34] Contract and Bond No. 20, C. Burton Foster, Aug. 5, 1873, box 3, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1871-1885, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[35] Contract and Bond No. 34, C. Burton Foster, Oct. 25, 1876, box 3, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1871-1885, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

Between December 2 and 6, 1873, Foster surveyed the subdivision lines of township 13 north, range 5 east, but he undertook no meanders of the Verde River. His failure to establish meander corners and to meander the stream was consistent with instructions set forth in the 1864 surveying manual that only navigable bodies of water were to be meandered on both banks. In general, his commentary when he encountered the stream was limited to a statement that the Verde was about one chain wide, and it had a gentle current and sandy bottom.[36]

Foster's general description of township 13 north, range 5 east, included the following description of the Verde:

> The Rio Verde flowing through the Tp. in a S.E. direction is a stream with banks about 3 feet high and of uniform width. The amount of water flowing with gentle current through its channel at an average depth of about 3 feet varies but little during the different seasons of the year and seldom overflows its banks.

He also observed that there were several farms on the east side of the river, using water from the Verde and from Clear Creek for irrigation, and he added that there was "in process of construction a large ditch to irrigate the valley lands in Tp. on the W. side of the Rio Verde."[37]

The plat of township 13 north, range 5 east (see below), shows the Verde River flowing in a southeasterly direction, a portion of which was through the Camp Verde Military Reservation. There is no indication on the plat that Foster meandered the Verde River. No meander lines appear on the plat; no meander data appear in the margins; and no surveyor is listed as having undertaken meanders. Aside from the lack of meanders, there is another indication on the plat that Foster did not consider the Verde River to be navigable – he noted

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[36] C. Burton Foster, "Field Notes of the Subdivision Lines of Fractional Township 13 North, Range 5 East, Gila and Salt River Meridian, Territory of Arizona," pp. 1, 17, 27, 31, 32, 48, 51, 52, 59, 62, 65, vol. R137, approved by Surveyor General July 1, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

[37] C. Burton Foster, "Field Notes of the Subdivision Lines of Fractional Township 13 North, Range 5 East, Gila and Salt River Meridian, Territory of Arizona," pp. 73-76, vol. R137, approved by Surveyor General July 1, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

what he labeled as a hay road running parallel to the river. The road suggests that the river was not used for transportation.[38]

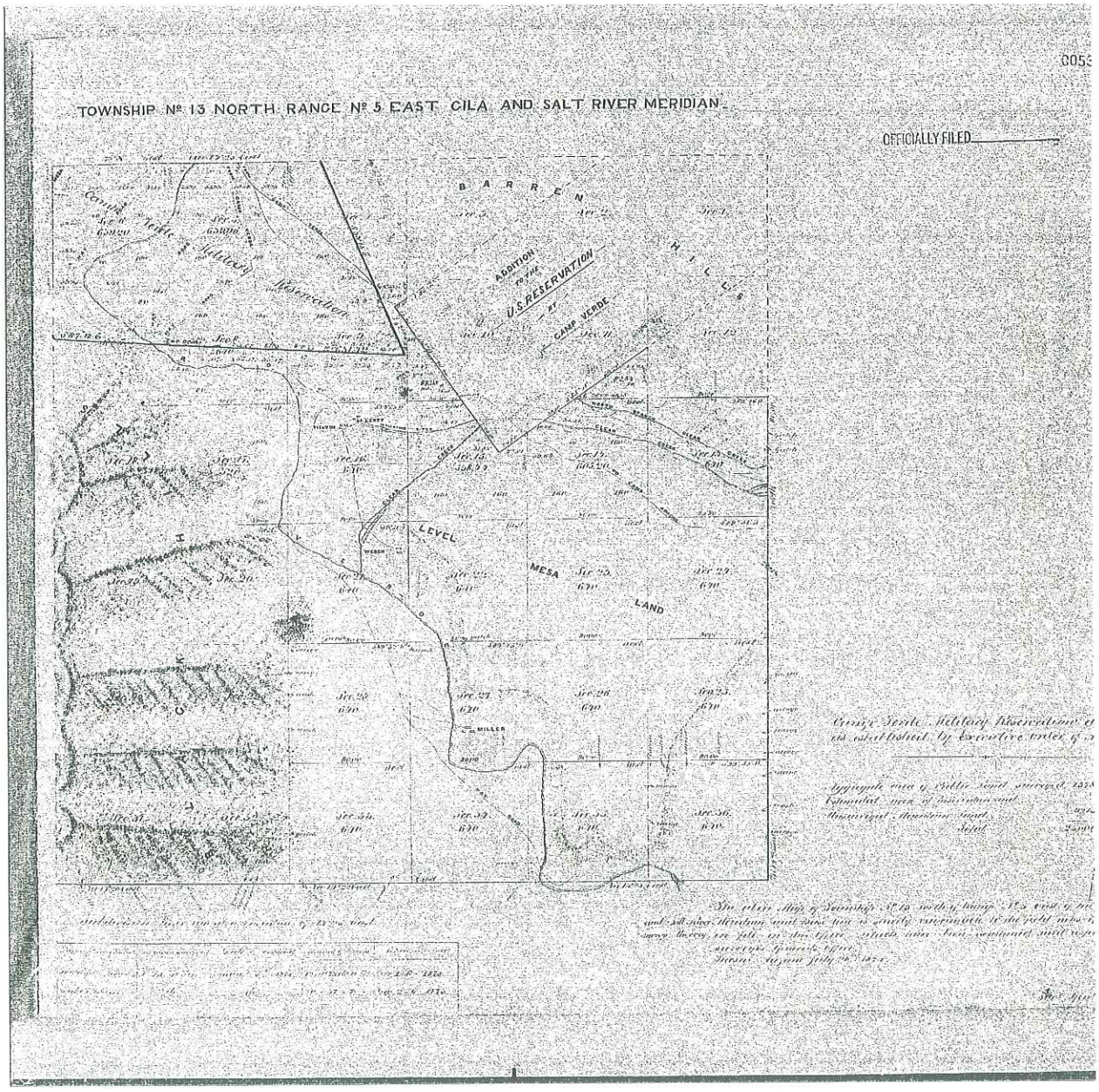

Figure 30. U.S. General Land Office Survey Plat of Township 13 North, Range 5 East (1873), U.S. Bureau of Land Management, Phoenix, Arizona

[38] C. Burton Foster, "Plat of Township 13 North, Range 5 East, Gila and Salt River Meridian, Arizona," approved by the Surveyor General on July 1, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

6. 1892-1893 Subdivision Survey of Townships 13-14 North, Range 5 East, and Township 14 North, Range 4 East

Between December 29, 1892, and January 5, 1893, Daniel Drummond surveyed the interior areas of the Camp Verde Military Reservation within townships 13-14 north, range 5 east, and township 14 north, range 4 east, under his contract dated October 31, 1892.[39] As noted above, some (but not all) of this area had been surveyed originally by C. Burton Foster in 1873 and 1877. Because Daniel Drummond's descriptions and treatment of the Verde were similar in all three townships, only township 13 north, range 5 east, will be discussed here.

Drummond's contract required that his survey be conducted "in strict conformity with the laws of the United States, the printed Manual of Surveying Instructions, and other surveying instructions issued by the Commissioner of the General Land Office, and with such special instructions as he may receive from the said Surveyor General in conformity therewith (all of said instructions to be taken and deemed a part of this contract)[.]"[40] As Drummond's contract provided, his work was to be conducted under the directions in the 1890 *Manual* telling surveyors to meander navigable bodies of water as well as streams over three chains wide that were not navigable. In addition, Drummond also received what were labeled under his contract "special instructions" from the Surveyor General. These directions stated that with reference to the Verde River, Drummond was to "establish Meander Corners on N. W. & South boundaries provided the right angle width [of the Verde] is equal or more than three chains, also on

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[39] Contract and Bond No. 24, Daniel Drummond, Oct. 31, 1892, box 4, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1886-1893, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[40] Contract and Bond No. 24, Daniel Drummond, Oct. 31, 1892, box 4, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1886-1893, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

township & subdivision lines crossing the river." Following those corner postings, he was to meander the entire stream within the areas covered by his contract.[41]

Following the 1890 *Manual*'s directions for recording non-navigable bodies of water over three chains wide and the special instructions he had received, Drummond clearly established meander corners at each intersection with the Verde, and he noted in most cases that the stream was considerably wider than three chains.[42] In his general description of the township, Drummond wrote:

> The Verde River is a fine stream of living water flowing through the Reservation from north to south and contains ample water for the purposes of irrigation. The high flood of Feby. 1891 has washed several hundred acres of fine bottom land, leaving in its stead stones, rocks, and gravel, forming the present bed of the river. Since the flood the banks of the river average a width of nearly 20 chains.[43]

Drummond's repetitive notation in the field notes that the Verde River was greater in width than three chains indicate that the basis for his meanders stemmed from the instructions to meander non-navigable bodies of water over three chains. This conclusion is substantiated by the indication on the plat for Drummond's survey, which covered all three townships in that survey (see below). That plat noted that a major irrigation ditch lay on the west side of the river. Another smaller ditch took water at a diversion dam in township 14 north, range 5 east, and it flowed south into township 13 north, range 5 east. In addition, roads roughly paralleled the stream through all three townships.[44]

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[41] U.S. Surveyor General of Arizona to Daniel Drummond, Nov. [n.d.], 1892, copy in Contract and Bond No. 24, Daniel Drummond, Oct. 31, 1892, box 4, Surveying Division "E," Surveying Contracts and Bonds File, Arizona, 1886-1893, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[42] Daniel Drummond, "Field Notes of the Resurvey of the Camp Verde Military Reservation, Arizona," pp. 13-18, vol. R2020, approved by the Surveyor General on April 21, 1893, U.S. Bureau of Land Management, Phoenix, Arizona.

[43] Daniel Drummond, "Field Notes of the Resurvey of the Camp Verde Military Reservation, Arizona," pp. 130-131, vol. R2020, approved by the Surveyor General on April 21, 1893, U.S. Bureau of Land Management, Phoenix, Arizona.

[44] Daniel Drummond, "Survey Plat of Camp Verde Military Reservation, Arizona," U.S. Bureau of Land

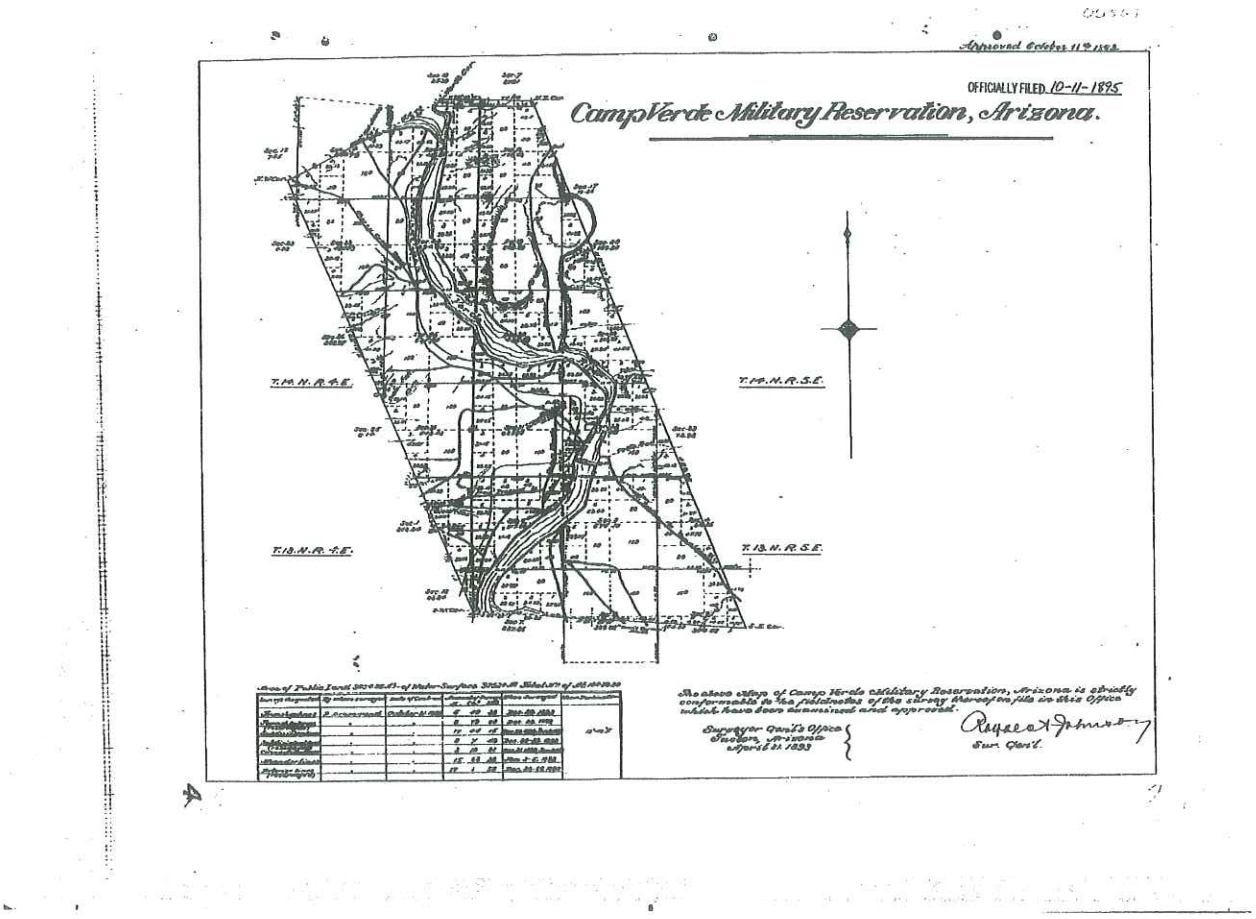

Figure 31. U.S. General Land Office Survey Plat of Township 13 North, Range 5 East (1895), U.S. Bureau of Land Management, Phoenix, Arizona

7. 1902 Subdivision Survey and 1911 Subdivision Resurvey of Township 3 and 4 North, Range 7 East

The townships along the Verde River between township 4 north, range 7 east, and township 13 north, range 5 east, either were surveyed after 1912 and therefore provide little useful information about the stream before Arizona statehood, or they were never surveyed at all due to the rugged terrain and their inclusion in national forests.[45]

Management, Phoenix, Arizona.

[45] These areas include townships 5-7 north, range 7 east; townships 7-11, range 6 east; township 11 north, range 7 east; township 12 north, range 6 east; township 12 north, range 5 east; and township 12.5 north, range 4 east.

The southern part of township 3 north, range 7 east, through which the Verde River flowed was not surveyed for subdivision lines because it was within the original boundaries of the Salt River Indian Reservation. However, the portion of that township north of Indian reservation and the part of township 4 north, range 7 east (both of which lay within the abandoned Fort McDowell Military Reservation) were surveyed in 1902 by Philip Contzen and resurveyed in 1911 by Robert Farmer. Township 3 north, range 7 east, will be discussed here as representative of the two townships.

Both the original survey and the resurvey of these townships clearly indicated that the Verde River had been meandered. Yet, as was the case in the township downstream, the meanders had been undertaken by Contzen and Farmer based on the 1890 instructions to meander non-navigable bodies of water more than three chains wide. This can be determined from other information available in the plats and notes by Contzen and Farmer. For example, Contzen's general description of township 3 north, range 7 east, pointed out that the former military reservation:

> is well watered by the Verde River, which carries an abundance of water, making irrigation successful. . . . There is [sic] quite a number of settlers in the Verde Valley who have made substantial improvements and have land under cultivation.[46]

Although Contzen specifically recorded what he called the "abundance of water" in the Verde River, he made no observations of any features suggesting navigability. On the contrary, his 1902 plat of township 3 north, range 7 east (approved in 1903 – see below), indicated the presence of two roads paralleling the stream, one on each side of the river. The presence of roads adjacent to the stream implies a lack of navigability. Second, the plat noted irrigation

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[46] Philip Contzen, "Field Notes of the Subdivision of Fort McDowell Field," pp. 237-239, vol. R1788, approved by the U.S. Surveyor General July 22, 1902, U.S. Bureau of Land Management, Phoenix, Arizona.

ditches heading on both banks of the stream but carried no suggestion of wharves, docks, or other features associated with navigation.[47]

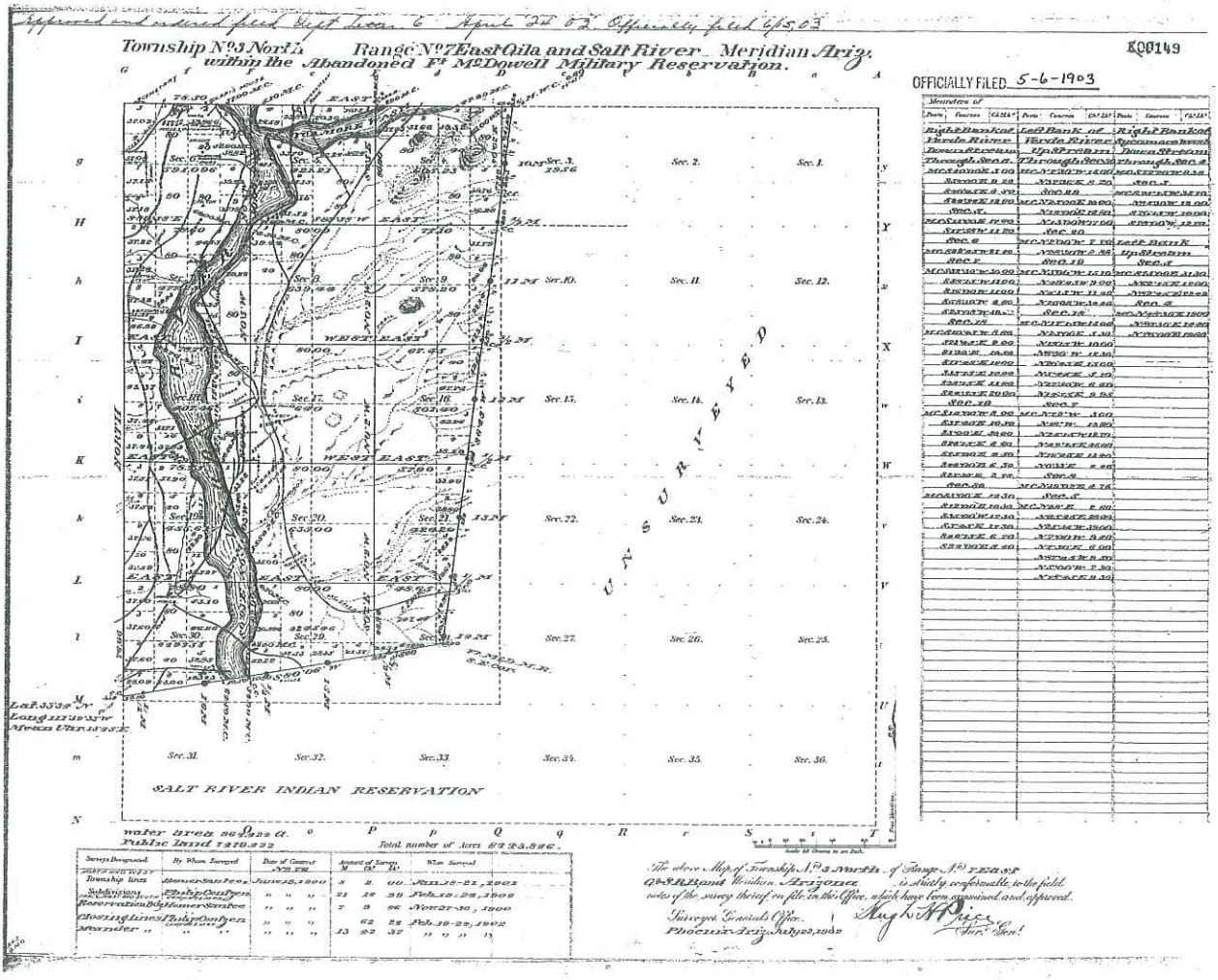

Figure 32. U.S. General Land Office Survey Plat of Township 3 North, Range 7 East (1903), U.S. Bureau of Land Management, Phoenix, Arizona

Robert Farmer's resurvey of the former Fort McDowell Military Reservation in February and March 1911 confirmed Contzen's treatment of the Verde as being non-navigable (see below for Farmer's plat, which was approved in 1913). Farmer's field notes of townships 3 and 4

[47] Philip Contzen, "Plat of Township 3 North, Range 7 East, Gila and Salt River Meridian within the Abandoned Fort McDowell Military Reservation," approved by the U.S. Surveyor General on July 22, 1902, U.S. Bureau of Land Management, Phoenix, Arizona.

north, range 7 east, recorded the placement of meander corners on the Verde in a manner consistent with the 1890 surveying instructions calling for meanders of non-navigable bodies of water that were more than three chains wide. At nearly every intersection with the river, Farmer routinely noted the width of the bed of the river as well as the distance across the channel of water that lay within the bed itself. In nearly each instance, both the bed and the channel were well over three chains wide.[48] In addition, Farmer's description of the Verde at places where survey lines intersected that stream denoted a river that would be difficult to navigate. For example, while running the line north between sections 31 and 32, he first set a meander corner on the right bank. He then wrote:

> 3.36 [chains] Enter shallow channel of Verde River, 1 ft. deep, course SE. 8.00 [chains] Leave channel; thence across sand bar, parallel to bank. 15.00 [chains] The right bank of main channel, course SE. 21.90 [chains] The left bank of Verde River, 8 ft. high.

Here, he set another meander corner.[49] Comparable descriptions of sand bars and shallow water were offered throughout the remainder of the field notes of this survey.[50] Farmer also wrote in his field notes that he "did not attempt to run line bet. secs. 5 and 6, from the temp. cor. of secs. 5, 6, 7 and 8, on sand bar, as this entire line was in river channel and on sand bar; and it was impracticable to [go] up the channel on account of high water."[51] Later in the notes, he added:

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[48] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 4, 6, 7, 9, 11, 16, 19, 21, 23, 24, 27, 29, 32, 36, 39, 49, 50, vol. R2396, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[49] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 1C-2, vol. R2396, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[50] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 4, 6, 7, 9, 11, 16, 19, 21, 23, 24, 27, 29, 32, 36, 39, 49, 50, vol. R2396, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[51] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt

> NOTE: The line bet. secs. 29 and 30 was run at a time when the water in the river was very low, and it was possible to run on the sand bar, and set temp. 1/16 sec. cors. Nos. 6 and 12, and 1/4 sec. cor., bet. secs. 29 and 30. When the lines through the S 1/2, middle, and N 1/2 of sec. 29 were run, the high water had come, and it was impossible to reach 1/16 and 1/4 sec. cors.; therefore, these lines were run West, on true lines.[52]

Finally, in the general description of the township, Farmer observed that there was a considerable degree of variation in the Verde River's depth of flow. As he explained, "[a]t the time of survey, it [the Verde River] was very low, being from 2 1/2 to 4 ft. deep."[53]

River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," p. 40, vol. R2396, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[52] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," p. 53, vol. R2396, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[53] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," p. 102, vol. R2396, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

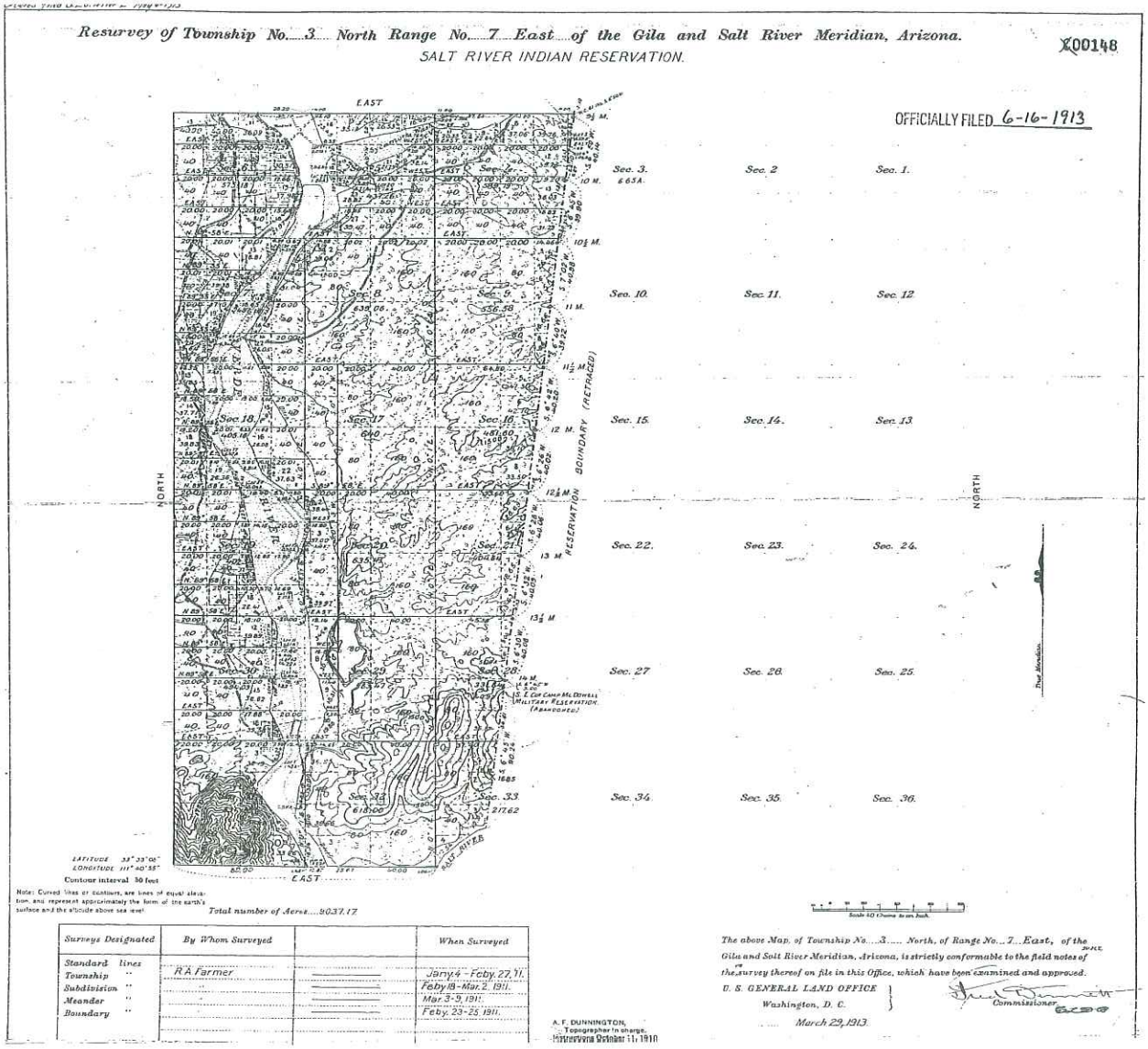

Figure 33. U.S. General Land Office Survey Plat of Township 3 North, Range 7 East (1913), U.S. Bureau of Land Management, Phoenix, Arizona

8. 1911 Subdivision Survey of Township 2 North, Range 7 East

The most downstream portion of the Verde River where it meets the Salt River lies in the northern part of section 5, township 2 north, range 7 east. On January 25, 1911, Robert A. Farmer meandered both banks of the Verde River in this township as part of his survey of the Salt River Indian Reservation boundary. The meanders of the both banks of the Verde are

recorded in Farmer's field notes of the survey and are shown on the plat of this survey.[54] The meanders, however, were not done as a result of Farmer's determination that the Verde River was navigable. Instead, Farmer's meanders were consistent with the instructions of the 1890 survey *Manual*, as continued in the 1894 and 1902 *Manuals* that "[b]oth banks of *navigable* rivers, as well as of all rivers not embraced in the class denominated as 'navigable,' the right angle width of which is *three chains* and upwards, will be meandered on *both* banks by taking the general courses and distances of their sinuosities, and the same are to be entered in the field book." (Emphases in original.)[55] Farmer's field notes and his plat (approved in 1913 – see below) clearly demonstrate that the reach of the Verde River in this township was considerably wider than three chains, and the stream thus met the criteria for meandering non-navigable bodies of water.

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[54] Robert A. Farmer, "Field Notes of the Survey of the Subdivision of T. 2 N. R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 11-17, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona; Farmer, Plat of Township 2 North, Range 7 East, Gila and Salt River Meridian, Arizona, approved by the Commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[55] *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1890), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 568.

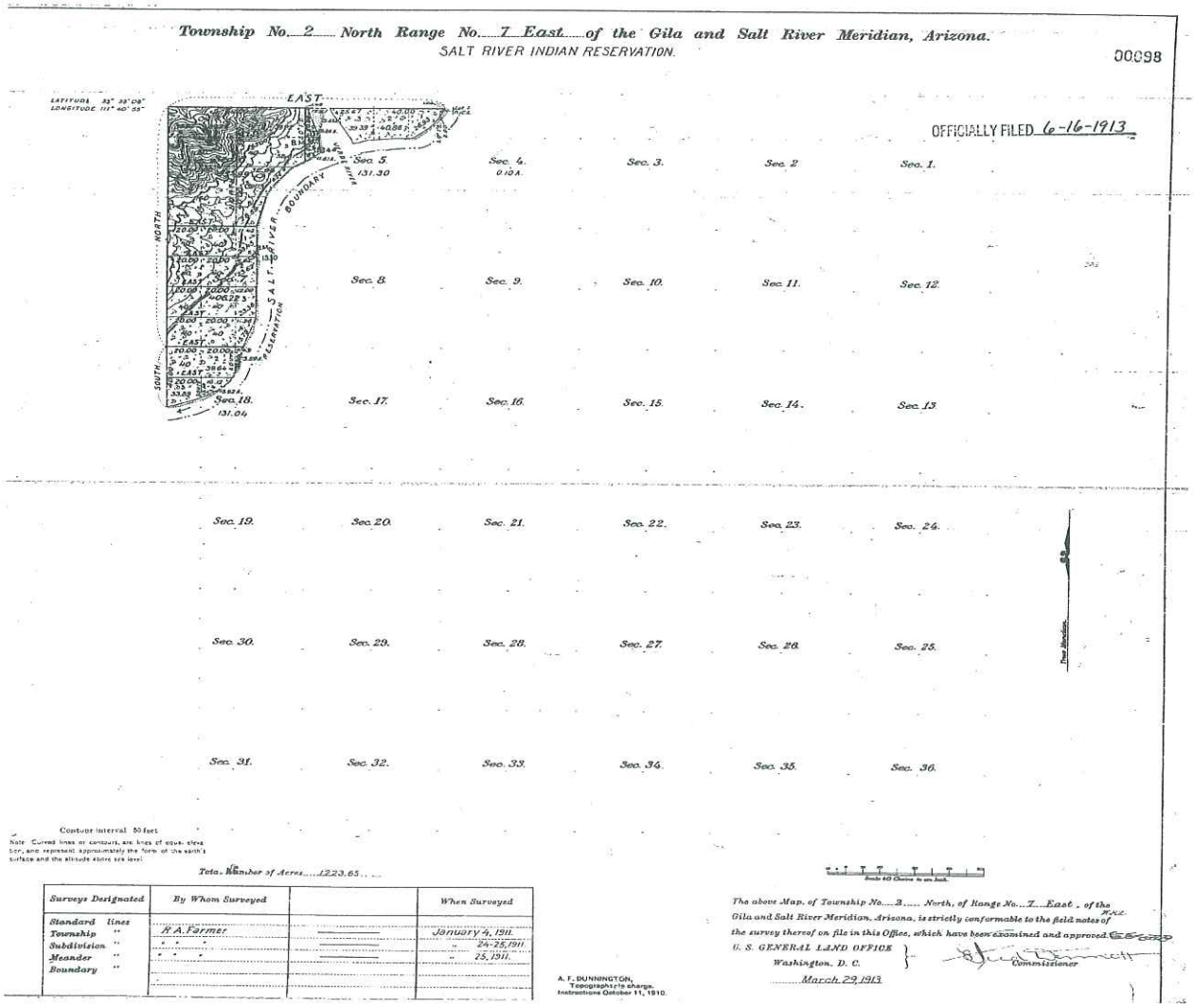


Figure 34. U.S. General Land Office Survey Plat of Township 2 North, Range 7 East (1913), U.S. Bureau of Land Management, Phoenix, Arizona

D. SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT SURVEYS ALONG THE VERDE RIVER

U.S. Government surveyors surveyed the Verde River a number of times in the years before Arizona entered the Union in 1912. These surveys were conducted under very precise instructions about now navigable and non-navigable bodies of water were to be recorded in surveyors' notes and on the plats they drew. Yet despite the fact that many surveyors encountered the river many times in the course of carrying out their work, in not one instance did

any surveyor record the Verde River as having characteristics that would have been consistent with a navigable body of water.

U.S. Government surveyors were specifically charged with the task of identifying navigable streams as part of their surveying duties, and the manuals and instructions under which they carried out their work were very precise about how navigable bodies of water were to be distinguished from non-navigable ones. As part of the U.S. Government's surveying efforts, the areas along parts of the Verde River were surveyed and resurveyed many times before 1912. Significantly, while those surveys were done at varying times of year, in different years, and by at least eight individuals, all of the descriptions and plats that resulted from this work consistently portrayed the Verde River as being a non-navigable stream.

IV. LAND PATENTS AND STATE GRANTS

The U.S. Congress passed a variety of homestead laws in the middle-to-late nineteenth century designed to facilitate the settlement of newly acquired lands in the West. The laws resulted in thousands of federal patents being issued to eager settlers determined to establish homes and farms in the West's unfamiliar climate. Before discussing federal land patents in relation to the Verde River a few words need to be said about the stream's location as portrayed on various maps because this has bearing on the location of patents discussed in this report.

A. HISTORICAL MAPS OF THE VERDE RIVER REGION

The U.S. Geological Survey began mapping some of the areas surrounding the Verde River prior to Arizona's admission to the Union in 1912. These were not the first U.S. Government maps to be made of the region, however. As noted in Chapter One, the U.S. General Land Office had conducted original surveys along the Verde beginning in the 1870s to facilitate homesteading and to create accurate legal descriptions of property. These original survey plats are reproduced in Chapter One. Subsequent mapping by the U.S. Geological Survey for the Verde River area began in the early 1900s and resulted in numerous topographic maps, the most detailed of which are quadrangles for areas along the Verde River including "Fort McDowell, Ariz." (1906), "Turret Peak, Ariz." (1929), and "Cave Creek, Ariz." (1939). (These are predecessors of come of the topographic quadrangle maps reproduced in Chapter One; see below for reproductions of these earlier maps.)

Figure 35. U.S. Geological Survey topographic map, "Ft. McDowell, Ariz.," 1906.

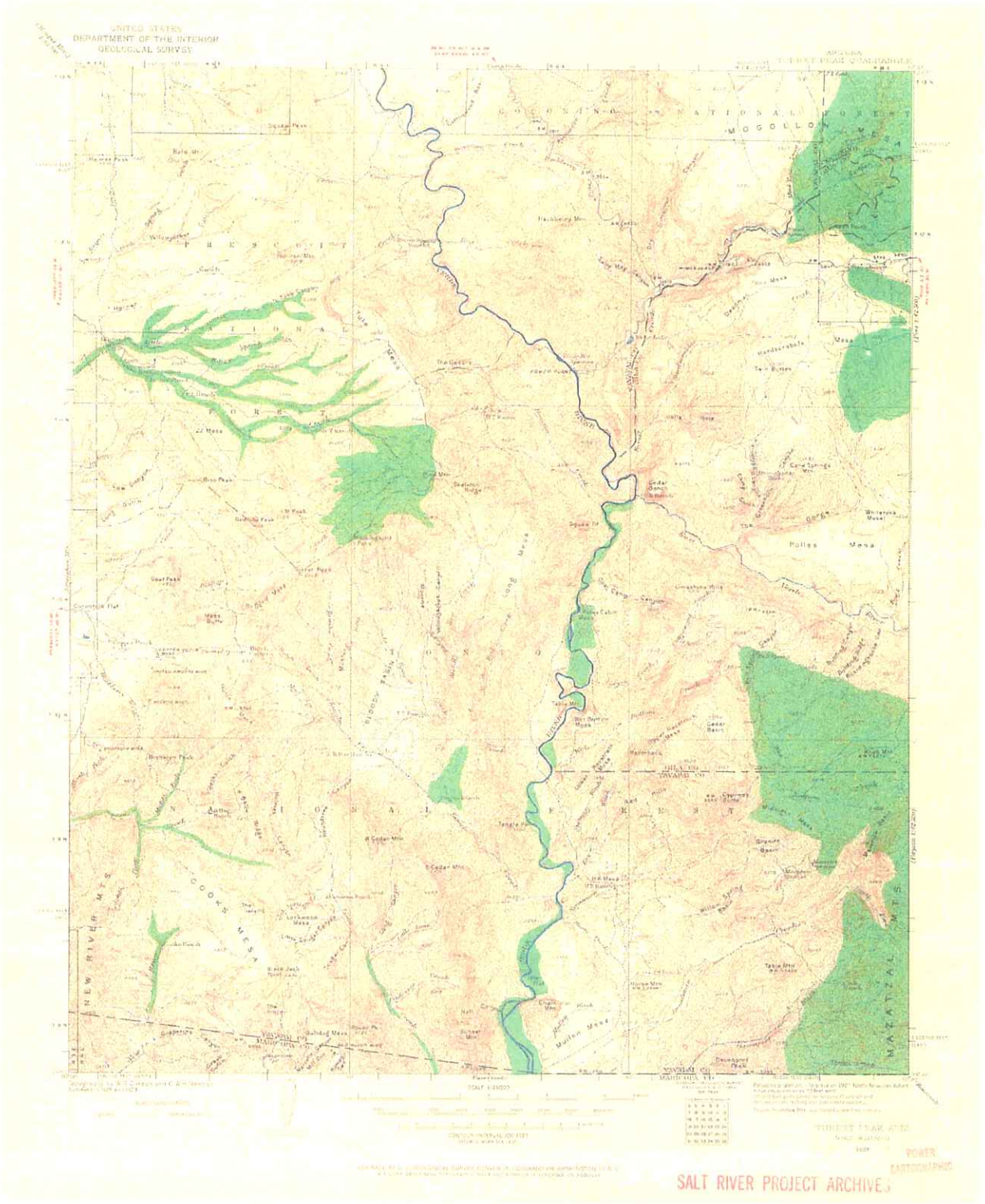


Figure 36. U.S. Geological Survey topographic map, "Turret Peak, Ariz.," 1929.

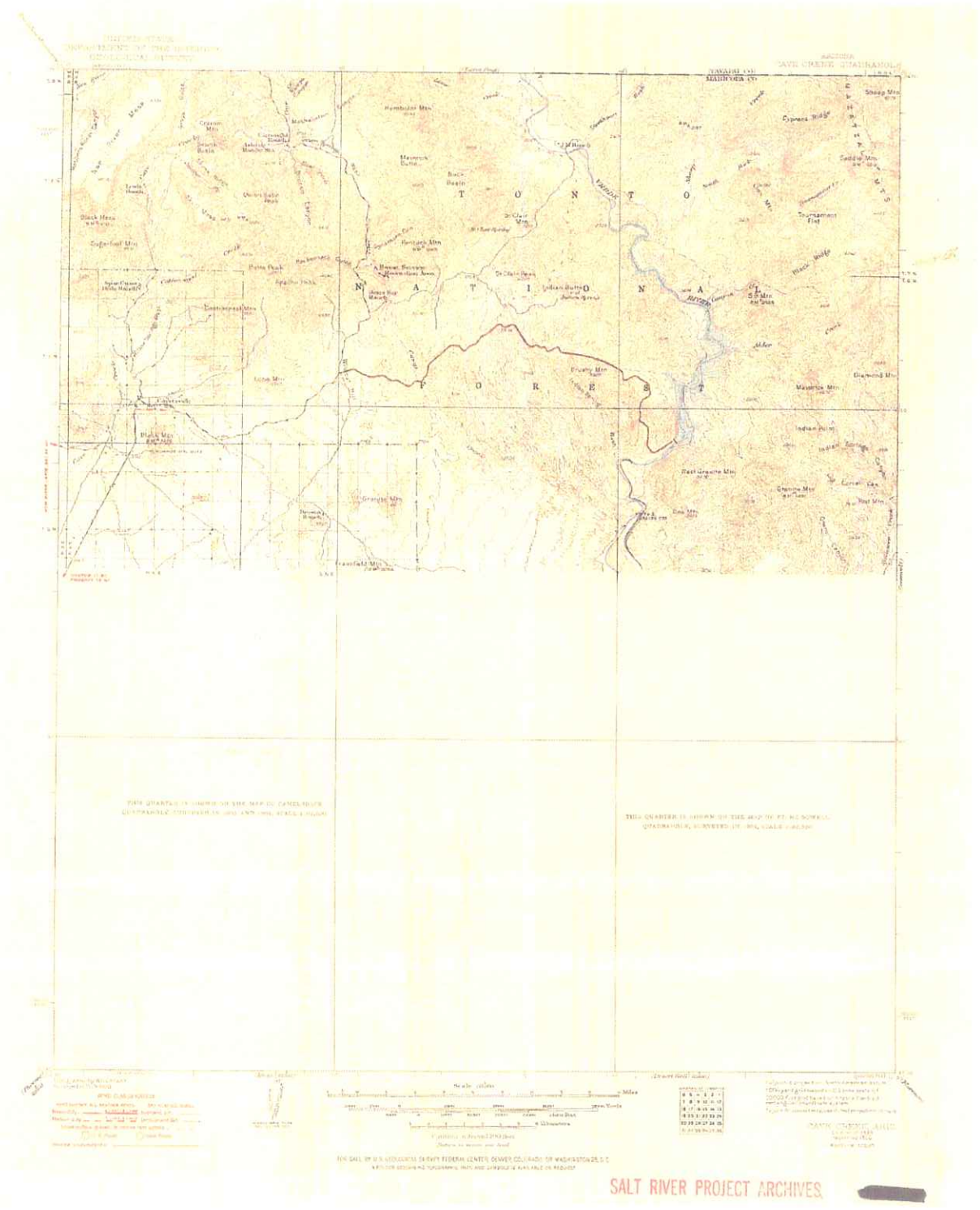


Figure 37. U.S. Geological Survey topographic map, "Cave Creek, Ariz.," 1939

By comparing the original U.S. General Land Office survey plats and the early U.S. Geological Survey topographic maps, it is clear that in some locations the Verde River changed its channel, albeit in minor ways due to the general narrowness of the canyons through which the stream flowed. Because of these shifts in the Verde River's position, homestead patents discussed below have been placed on seven exhibit maps drafted for this report showing the stream's position as of the date of the original surveys and at the time the earliest U.S. Geological Survey topographic maps were drawn. (The exhibit maps are included later in this chapter.) In addition, two other maps have been consulted to help reconstruct the location of the Verde River as close to the time of statehood as possible. One is "Agricultural Land and Ditches of the Verde Valley," drafted by Yavapai County Surveyor Park W. Latimer in 1908. The second is "Verde Valley – Irrigated Lands and Irrigation Ditches along the Verde River and Its Tributaries," produced by Maricopa County Water Commissioner H.L. Hancock in 1914 (see below).

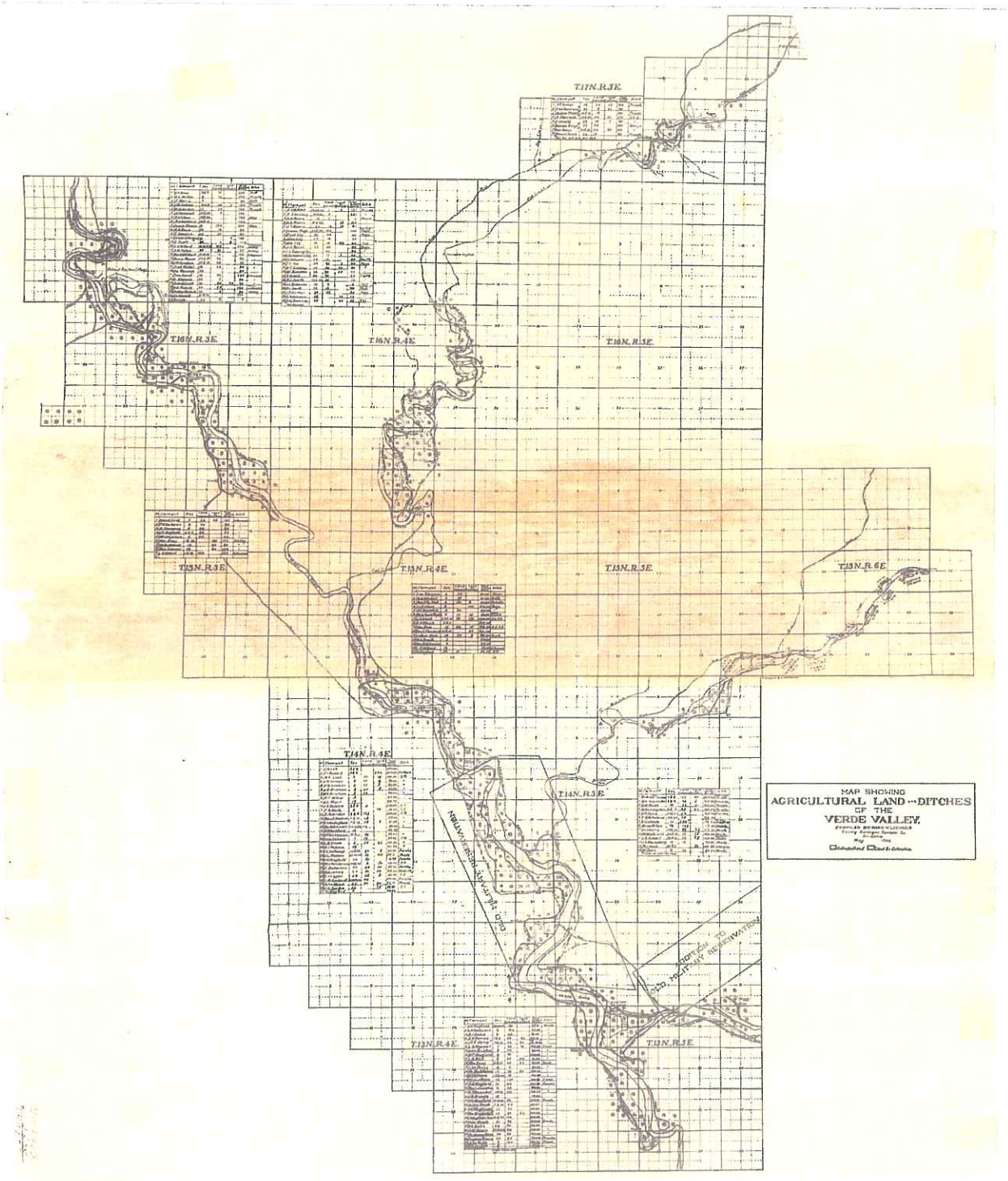


Figure 38. Park W. Latimer, Map of "Agricultural Lands and Ditches of the Verde Valley," 1908, Arizona State Library, Phoenix, Arizona

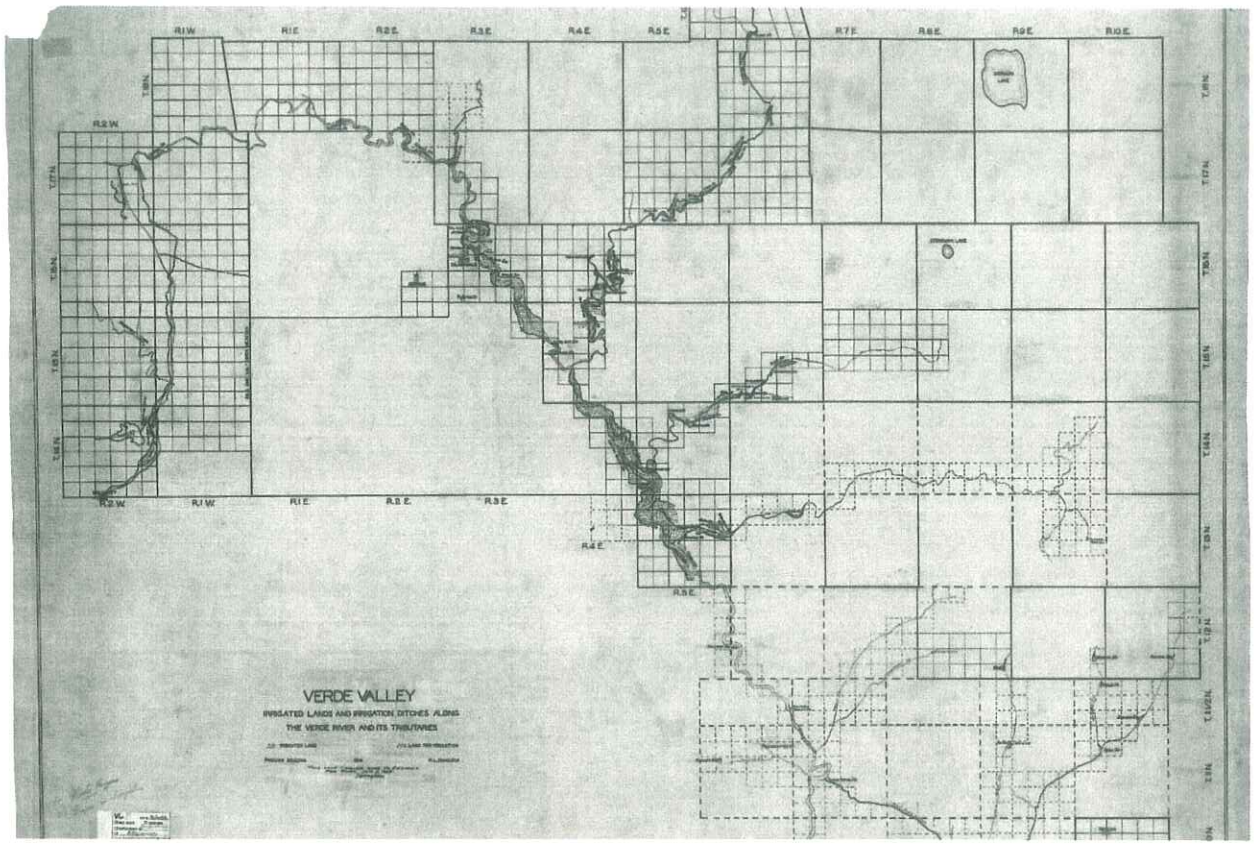


Figure 39. H.L. Hancock, Map of "Verde Valley – Irrigated Lands and Irrigation Ditches along the Verde River and Its Tributaries," 1914, Salt River Project, Phoenix, Arizona

B. BACKGROUND INFORMATION ON HOMESTEADING AND FEDERAL LAND PATENTS

With the General Land Office surveys having provided an orderly system for the U.S. Government to dispose of the public domain in the Territory of Arizona, settlers began to acquire parcels of land through homesteading. The various homestead laws passed by U.S. Congress in the mid- to late nineteenth century generally required a settler to file an application and make a small payment for a given parcel of land with the nearby federal land office.[56] The application would describe the land by township, range, and section, and within each six-hundred-forty-acre

[56] The most important of these laws was *An Act of Secure Homesteads to Actual Settlers on the Public Domain*, 12 Stat. 392 (1862), generally known as the *Homestead Act*.

section by a fractional identification. For example, a typical one-hundred-sixty-acre parcel might be described as the northeast quarter of section 7, township 17 north, range 2 east, Gila and Salt River Base and Meridian. A forty-acre parcel might be the northwest quarter of the southeast quarter, and a twenty-acre parcel might be the west half of the southwest quarter of the southwest quarter.

Once the application had been filed, the settler was required to live on the land for a number of years and make various improvements. When the necessary time had elapsed, he or she could return to the land office with witnesses to file affidavits stating that homesteading requirements had been met. There, the settler would also complete any remaining paperwork. The affidavits and paperwork created a patent file that contained a great deal of information about the settler and the land he or she wanted to acquire. The patent files – containing the details of the applications, the affidavits, other documents, and records of payments – are distinct and different sets of materials from the actual patents themselves, which are simply deeds to individual owners. The patent files for this report were obtained at the National Archives in Washington, D.C. The actual patents were located at the offices of the Bureau of Land Management in Phoenix.

The applicant and witness affidavits typically described the parcel in question, the number of acres, the crops farmed, the improvements made, as well as other pertinent information (such as, for example, irrigation canals and diversion points). Depending on the parcel, the type of patent, and whether there was any controversy involved, the patent file might also contain other information such as court documents, reports, and correspondence. If the land office approved the affidavits, the settler would pay an additional small fee, and he or she would be rewarded with the patent to his or her parcel.

In relation to the Verde River, many patent applications were filed with the General Land Office for parcels in sections overlapping the stream between the western boundary of township 17 north, range 2 west, and the southern boundary of township 13 north, range 5 east. The lands lying between township 13 north, range 5 east, southward to the Verde's confluence with the Salt River were withdrawn from the public domain for various reasons such as U.S. Reclamation Service projects, national forests, potential hydroelectric power generation sites, and Indian reservations. Those townships, therefore, do not have any patents recorded. (See below for a map showing land withdrawals along the historic Verde River.)

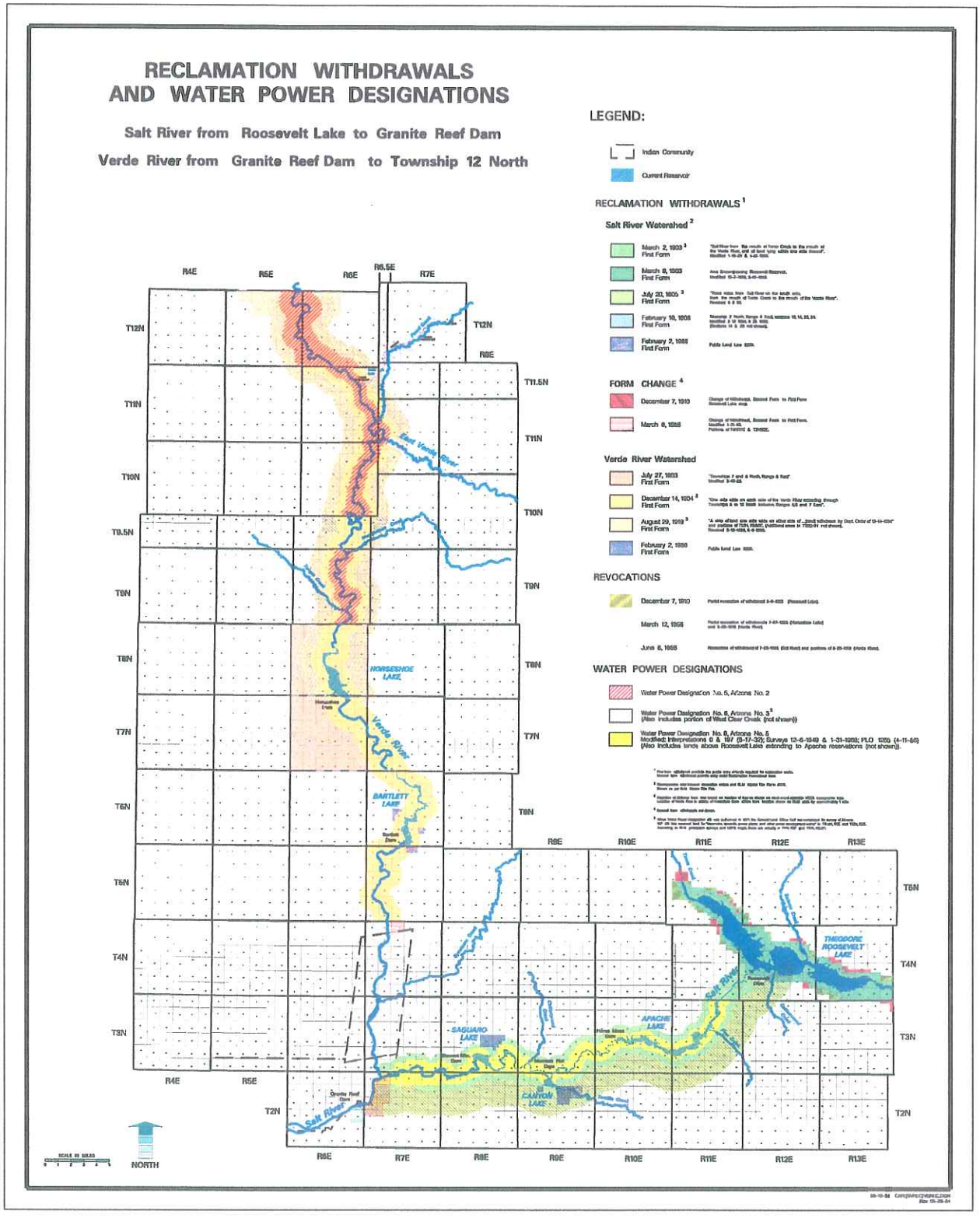


Figure 40. Map of "Land Withdrawals and Water Power Designations," Salt River Project, Phoenix, Arizona

Patents on non-withdrawal lands can be located on the U.S. Bureau of Land Management's Master Title Plats and Historical Indices, which are cartographic records of how the U.S. Government has disposed of (or otherwise encumbered) the public domain. The Master Title Plats and Historical Indices also show land grants made to the State of Arizona. (See below for examples of these documents.)

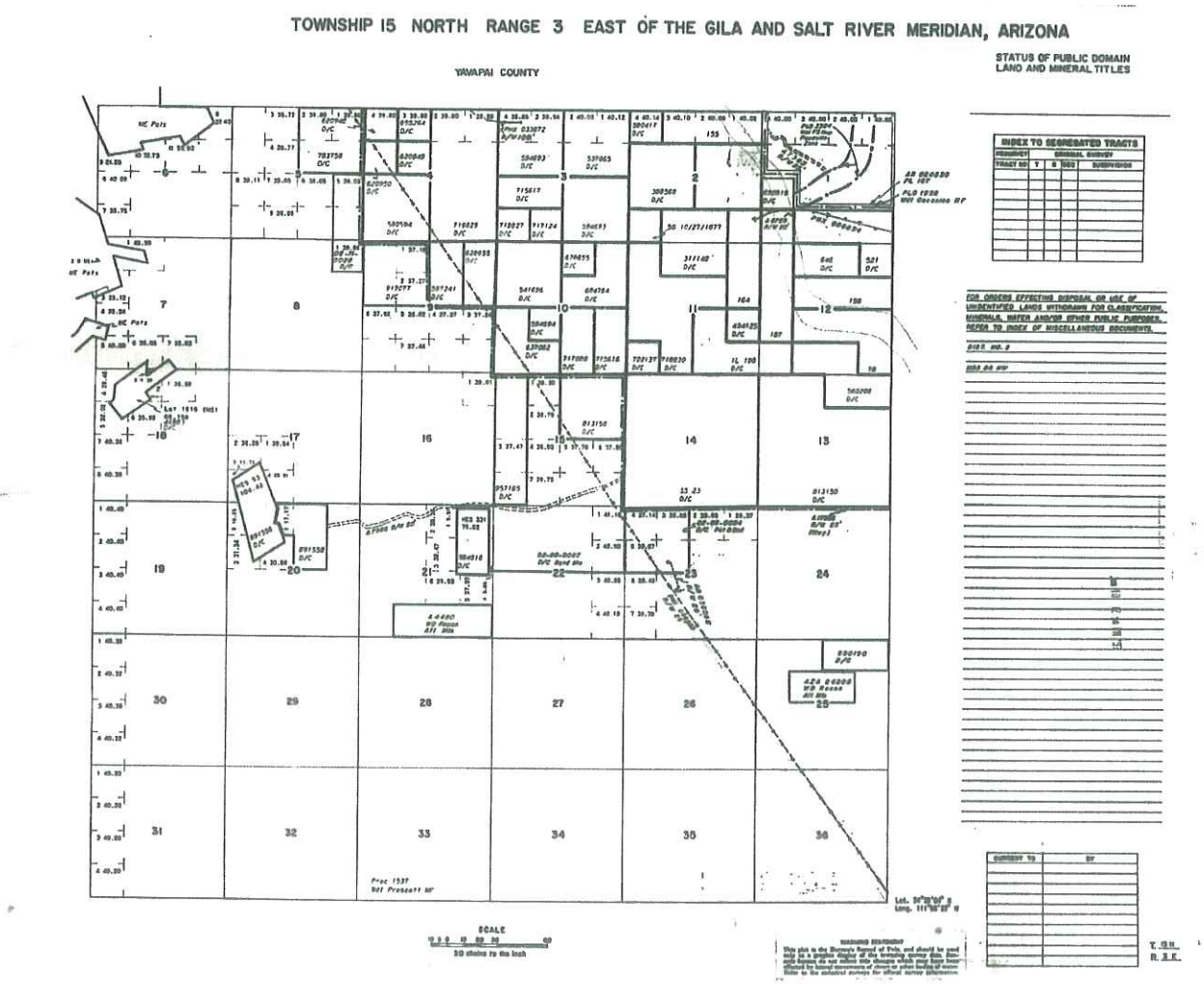
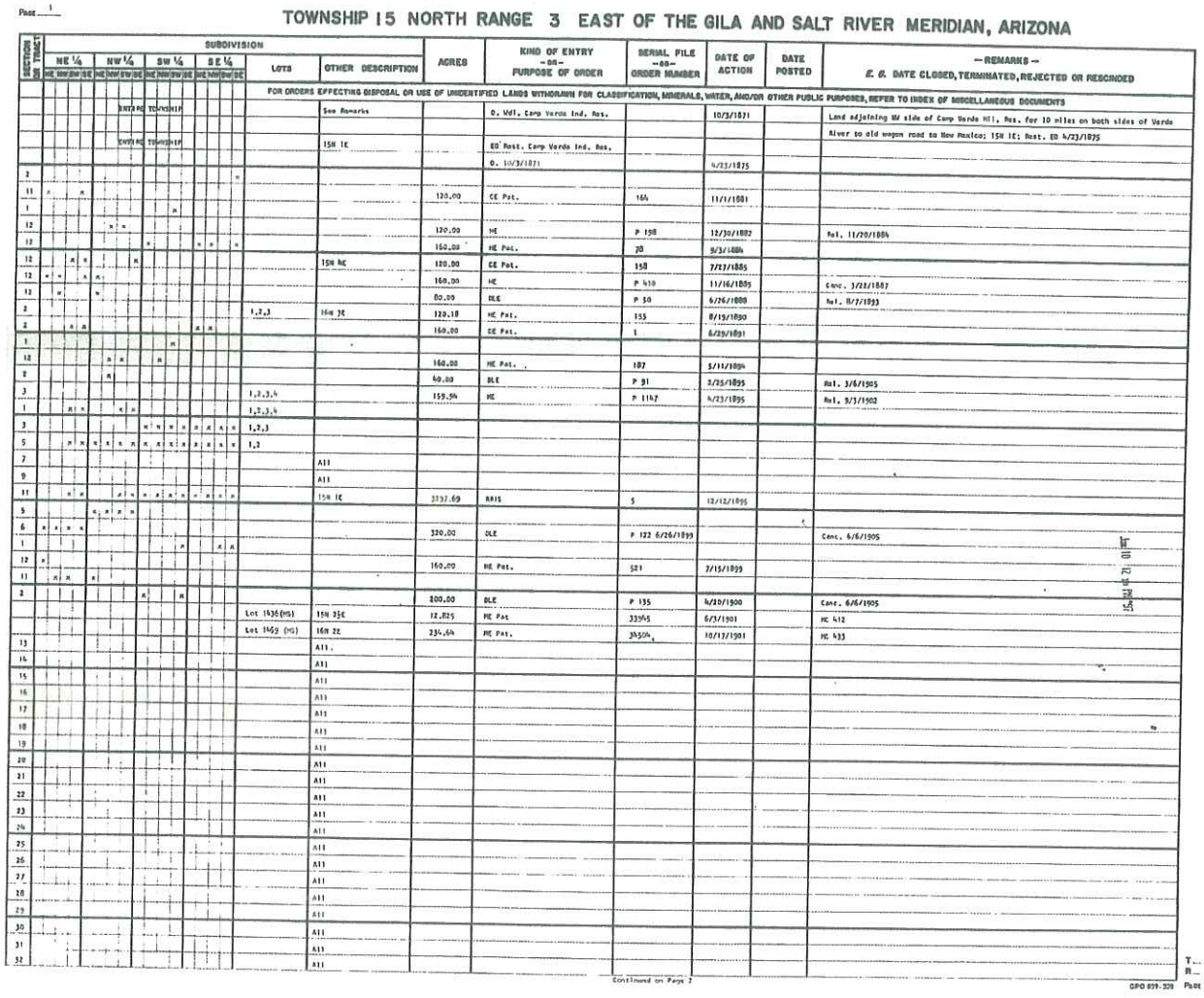


Figure 41. Example of U.S. Bureau of Land Management's Master Title Plat for Township 15 North, Range 3 East



TOWNSHIP 15 NORTH RANGE 3 EAST OF THE GILA AND SALT RIVER MERIDIAN, ARIZONA

SECTION OR TRACT	SUBDIVISION	LOTS	OTHER DESCRIPTION	ACRES	KIND OF ENTRY —OR— PURPOSE OF ORDER	SERIAL FILE —OR— ORDER NUMBER	DATE OF ACTION	DATE POSTED	—REMARKS— U. S. DATE CLOSED, TERMINATED, REJECTED OR RESCINDED
	FOR ORDERS EFFECTING DISPOSAL OR USE OF UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION, MINERALS, WATER, AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS								
			See Remarks		O. Mil. Camp Verde Ind. Res.		10/3/1871		Land adjoining W side of Camp Verde Mil. Res. for 10 miles on both sides of Verde River to old wagon road to New Mexico; 15N 1E; Rest. EO 4/23/1875
			15N 1E		EO Rest. Camp Verde Ind. Res. O. 10/3/1871		4/23/1875		
2									
11				120.00	CE Pat.	164	11/1/1881		
1									
12				120.00	HE	P 158	12/30/1882		Rel. 11/20/1884
12				160.00	HE Pat.	28	9/3/1884		
12			15N 4E	120.00	CE Pat.	158	7/23/1885		
12				160.00	HE	P 410	11/16/1885		Canc. 3/23/1887
12				80.00	DLE	P 50	6/26/1888		Rel. 11/7/1893
2		1,2,3	16N 3E	120.18	HE Pat.	155	8/19/1890		
2				160.00	CE Pat.	1	6/29/1891		
1									
12				160.00	HE Pat.	187	5/11/1894		
2				40.00	DLE	P 91	3/25/1895		Rel. 3/6/1905
3		1,2,3,4		159.54	HE	P 1147	4/23/1895		Rel. 9/3/1902
1		1,2,3,4							
3		1,2,3							
5		1,2							
7			All						
9			All						
11			15N 1E	3737.69	RRIS	5	12/12/1895		
5									
6				320.00	DLE	P 122 6/26/1899			Canc. 6/6/1905
1									
12				160.00	HE Pat.	521	7/15/1899		
11									
2				200.00	DLE	P 135	4/20/1900		Canc. 6/6/1905
		Lot 1436(MS)	15N 3½E	12.825	HE Pat	33945	6/3/1901		HE 412
		Lot 1452 (MS)	16N 2E	234.64	HE Pat.	34504	10/17/1901		HE 433
13			All						
14			All						
15			All						
16			All						
17			All						
18			All						
19			All						
20			All						
21			All						
22			All						
23			All						
24			All						
25			All						
26			All						
27			All						
28			All						
29			All						
30			All						
31			All						
32			All						

Continued on Page 2

Figure 42. Sample page of a U.S. Bureau of Land Management's Historical Index to Township 15 North, Range 3 East

The four sets of records discussed above – 1) the U.S. Geological Survey historical topographic maps, 2) the U.S. General Land Office original survey plats, 3) the 1908 Latimer map and the 1914 Hancock map, and 4) the Bureau of Land Management's Master Title Plats – were used to create the maps identified as Exhibits 1-7, which are reproduced later in this chapter. To create these maps, the U.S. Geological Survey historical topographic maps, U.S. General Land Office survey plats, and the Latimer and Hancock maps were digitized and

combined by Salt River Project Cartographic & GIS Services in Phoenix, Arizona. With this product, the U.S. Bureau of Land Management's Master Title Plats and Historical Indices provided by Littlefield Historical Research were consulted to place the federal patents upon Exhibits 1-6 (see below for copies of these exhibits). (For Exhibit 7, which shows Arizona State patents, the same process was used, using plats created by the Arizona State Land Department – see later in this chapter regarding State acquisition and disposition of federally-granted lands and for a copy of Exhibit 7.)

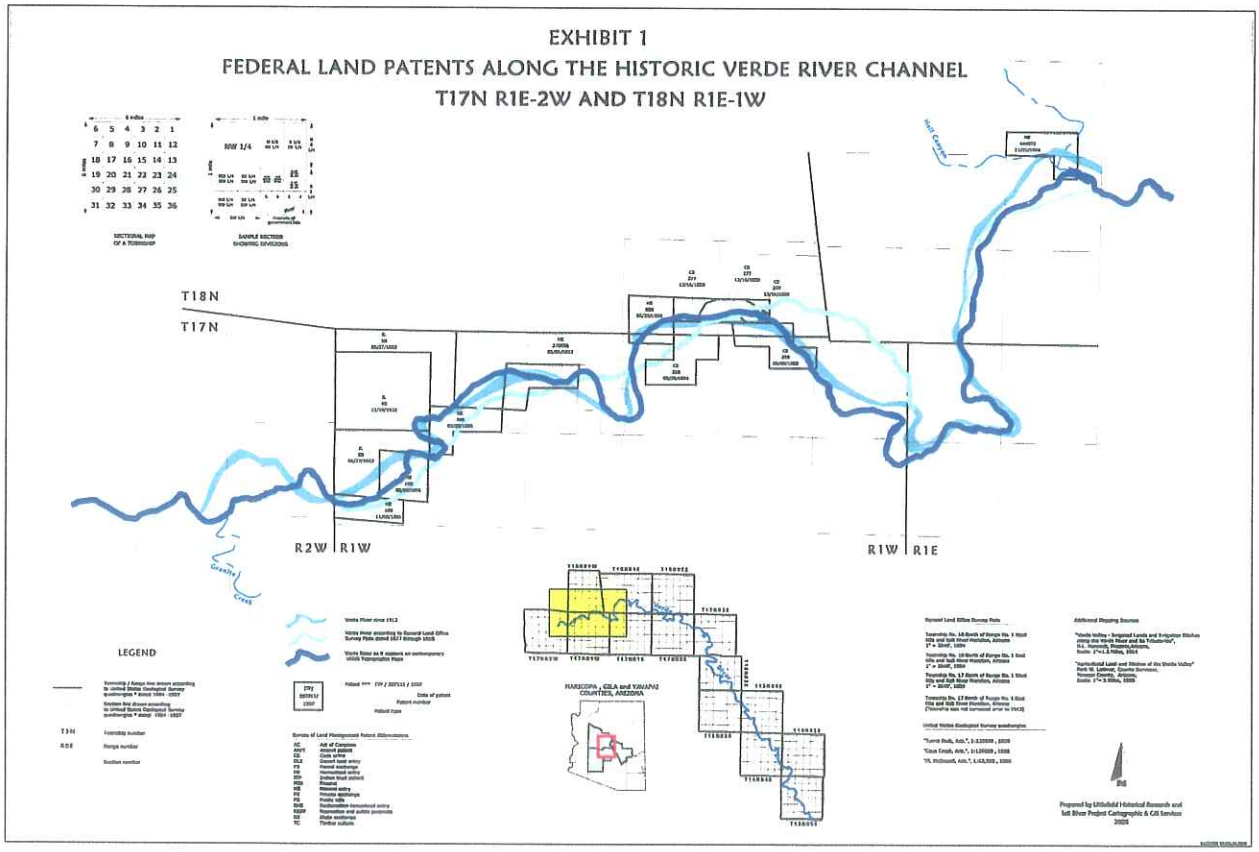


Figure 43. Exhibit 1, Federal Land Patents along the Historic Verde River Channel – T17N, R1E-2W and T18N, R1E-1W, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

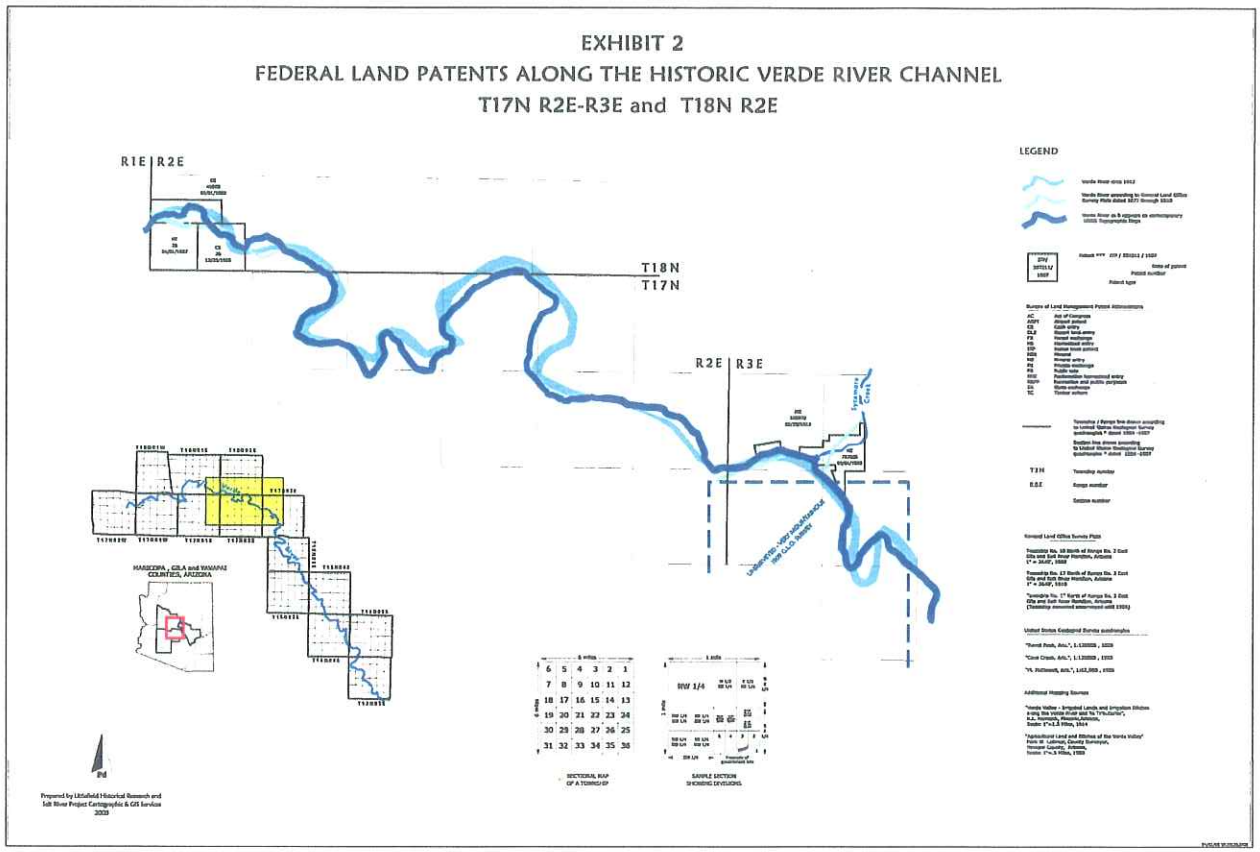


Figure 44. Exhibit 2, Federal Land Patents along the Historic Verde River Channel – T17N, R2E-R3E and T18N, R2E, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

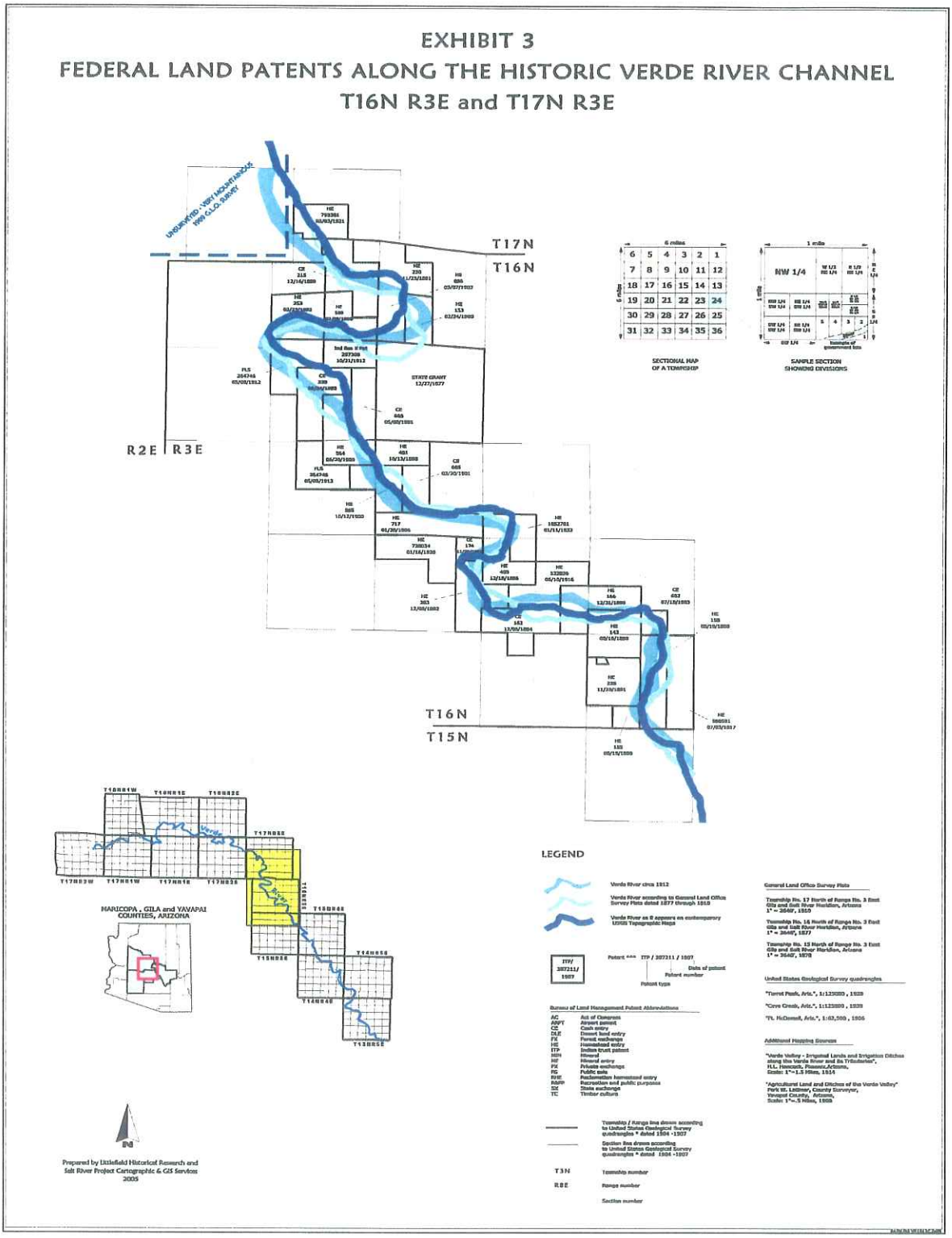


Figure 45. Exhibit 3, Federal Land Patents along the Historic Verde River Channel – T16N, R3E and T17N, R3E, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

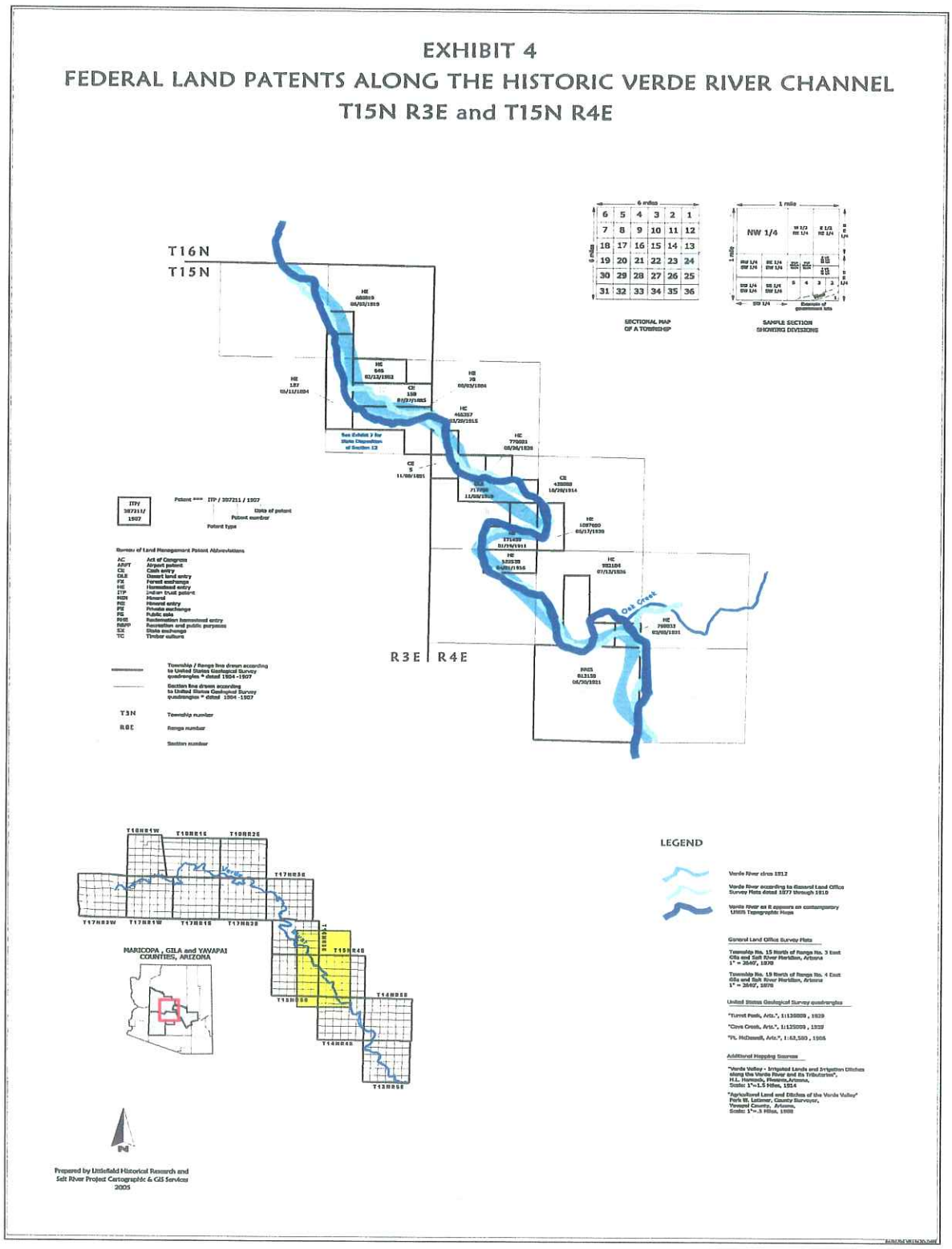


Figure 46. Exhibit 4, Federal Land Patents along the Historic Verde River Channel – T15N, R3E and T15N, R4E, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

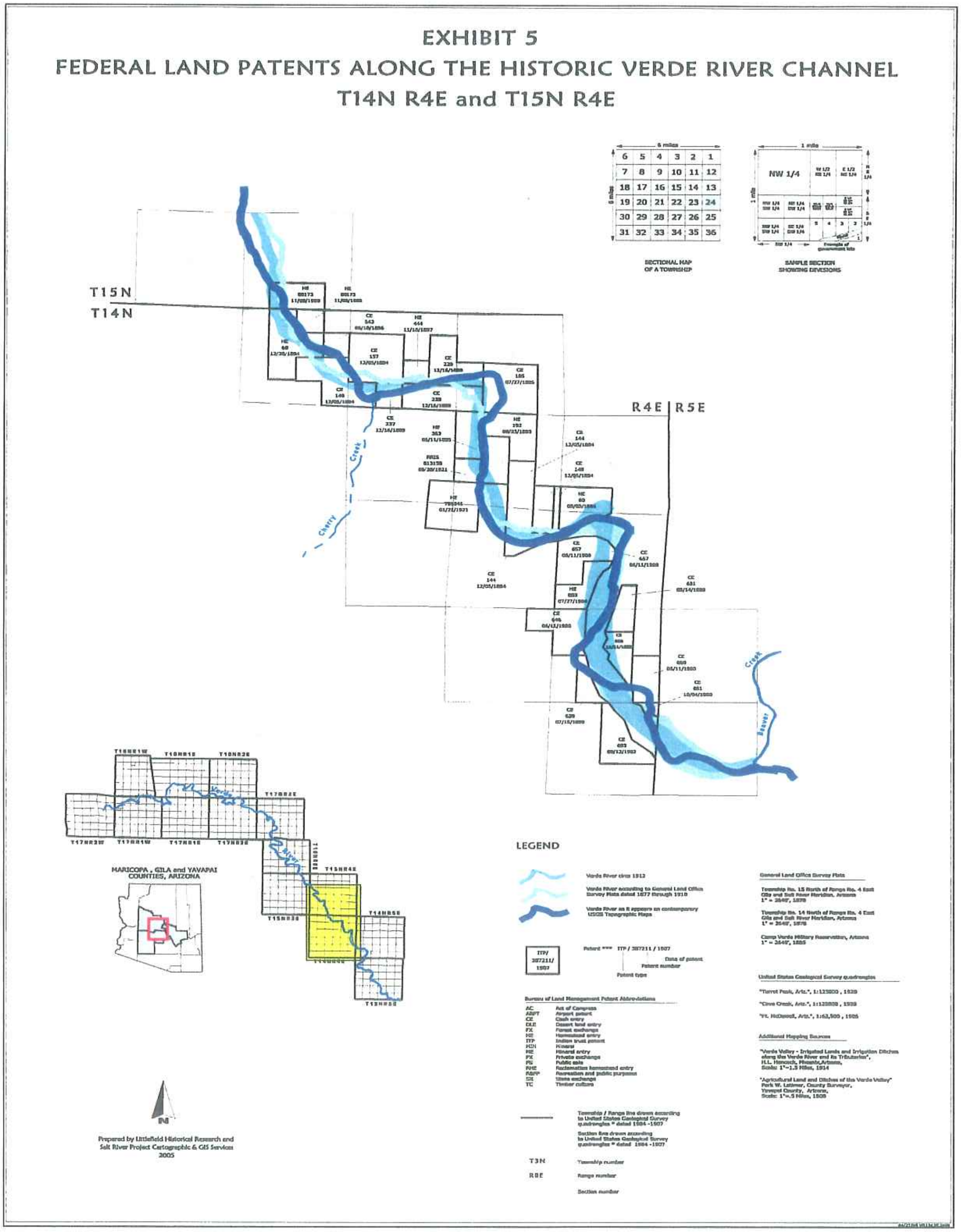


Figure 47. Exhibit 5, Federal Land Patents along the Historic Verde River Channel – T14N, R4E and T15N, R4E, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

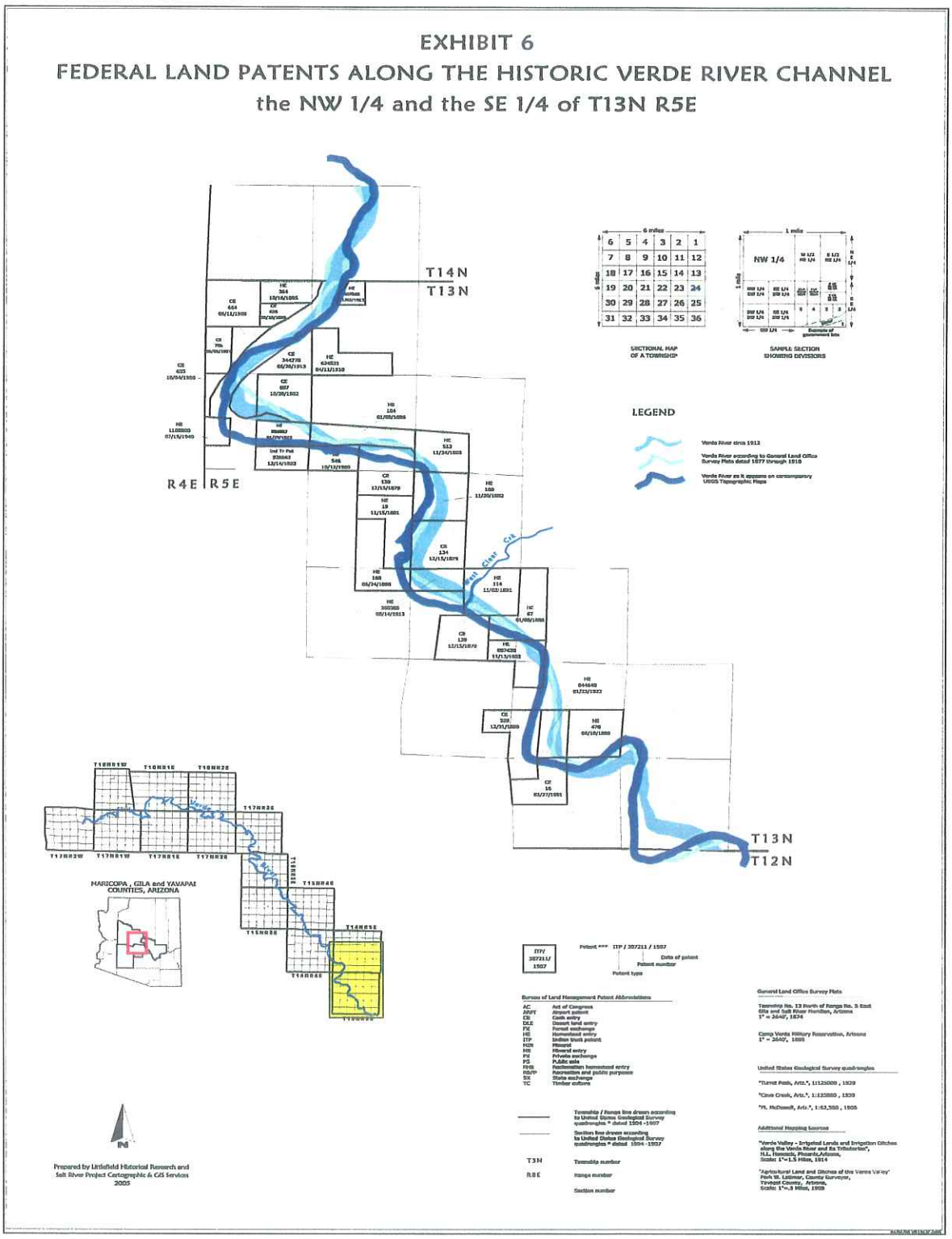


Figure 48. Exhibit 6, Federal Land Patents along the Historic Verde River Channel – the NW 1/4 and the SE 1/4 of T13N, R5E, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

1. Significance of Patents to the Verde River's Potential Navigability

Federal patents to private parties and the supporting files are important in ascertaining the potential navigability of the Verde River around the time of statehood for several reasons. First, the patents indicate the total amount of land awarded by the United States. The acreage is significant because if the Verde River flowed through the parcel and had been considered navigable, federal officials presumably would not have granted the title of the bed of the stream to private parties. Arizona would have owned the bed and banks due to the State's sovereignty. As a result, a patent to a quarter section through which the stream ran would have been recorded as somewhat less than one-hundred-sixty acres, with a full section being six hundred forty acres. Moreover, if the river had been considered navigable, an irregularly-shaped parcel next to the river would have been identified as a "government lot" instead of as an even division of a six-hundred-forty-acre section. In other words, a patent to a small parcel of land lying next to a navigable body of water would have a reference to, hypothetically, "government lot 3, consisting of 27.4 acres."[57]

Importantly, none of the patents issued by the U.S. Government that overlay the Verde River (regardless of their respective dates) contain any provisions for reserving the bed of the river to Arizona. There is also no evidence that Arizona, upon joining the Union, chose lands in lieu of those previously patented upon the river bed. "In-lieu" (or "indemnity") selections were public domain lands chosen by a state or railroad to compensate for overlapping claims to state or railroad ownership elsewhere. While there are some government lots lying next to meandered

[57] For details on how federal surveyors were to handle creating government lots next to navigable bodies of water, see *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (Washington, D.C.: Gideon and Co., 1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 434, 436-437. See also for examples of how government lots were established, *Instructions to Deputy Surveyors of the United States for the District of Illinois and Missouri* (St. Louis: N.p., 1856), reprinted in ibid., pp. 425, 430.

portions of the Verde River, those lots were not created due to the stream's navigability. Instead, the lots were formed because of surveying instructions pertaining to meanders of non-navigable bodies of water (see Part III).

Another reason why patents are important to help determine whether the Verde River was navigable at the time of statehood relates to their supporting files. Because settlers had to sign affidavits regarding improvements and similar documents had to be secured from eyewitnesses, patent files not only reiterate acreage being assigned, but they also sometimes convey details such as whether farmers built irrigation ditches from the Verde River or whether settlers used the stream for other purposes. Again, nothing in supporting patent files suggests that the Verde River was navigable or that settlers used the stream for transportation.

C. FEDERAL PATENTS TO PRIVATE PARTIES IN THE PRINCIPAL STUDY AREA

This report will discuss representative U.S. Government patents along the Verde River between township 17 north, range 2 west, downstream to township 13 north, range 5 east. While this part of the report does not include every township or every patent within this area to keep the discussion to manageable proportions, all patents in all townships for the area have, in fact, been reviewed. None contradicts the evidence presented here.

Much of the land through which the Verde River flows below township 13 north, range 5 east, was withdrawn for various public purposes or was too rugged for settlement. Because no patents were granted there, those townships are not discussed in this part of the report. All of the Verde River patents considered here are displayed on the six federal map exhibits included above. In the discussion presented here, representative patents and their files will be reviewed going downstream.

1. Federal Patents on the Verde River in Township 17 North, Range 1 West

In section 3 of township 17 north, range 1 west, Farrall Tiernan made final proof for a cash entry patent on November 6, 1886. The Verde River flowed through this land. John Duke, one of Tiernan's witnesses, stated in his witness affidavit that "*the Verde river runs through it [the patent]*, it is mountainous." (Emphasis added.) Frank Krell, another witness for Tiernan, wrote that the "*Verde River runs through the center of it*. There is about fifteen acres of bottom land on the river and the rest is hilly land on both sides." (Emphasis added.) When asked, "[d]oes your claim control or include any water supply?" even the claimant himself answered that "[i]t does. The Upper Verde River." Nonetheless, the U.S. Government patented the land without reserving the bed and the banks of the stream for Arizona. Tiernan received the full 160 acres of land on September 28, 1894.[58]

2. Federal Patents on the Verde River in Township 17 North, Range 1 East

Just downstream, Joseph Brazil filed a homestead claim on land now lying in the Tusayan National Forest (today, the Tusayan District of the Kaibab National Forest) in sections 20 and 29. When plotted on historical maps of the region, it is clear that the river flowed through a large portion of section 29. On July 14, 1913, District Forester Paul E. Millar submitted a report recommending favorable action on the claim. In this report, Millar wrote:

> Power possibilities exist as *tract crosses Verde River* which flows about 1,000 miner's inches of water. . . . The S1/2 SW1/4 embraces about forty acres of rocky woodland mesa some 300 feet above the Verde River and the remainder is the precipitous rocky slope of Hells Canyon, no ground suitable for agriculture. SW1/4 SE1/4 of Section 20 embraces the precipitous rocky walls, sandy flood plain and rocky bed of the MC Canyon, no agricultural land. NW1/4 NE1/4

[58] Cash Entry Patent File 318, 1886, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Cash Entry Patent 318, 1894, U.S. Bureau of Land Management, Phoenix, Arizona.

> Section 29 embraces mouths of Hells and MC Canyons and rocky bed of Verde River. [Emphasis added.]

At the end of the report, Millar wrote that the parcel "is held to maintain a watering place on the Verde River for the cattle owned by claimant." No land was reserved for Arizona due to the presence of the Verde River. Brazil was granted 160 acres in the form of homestead patent 444072 in 1914.[59]

3. Federal Patents on the Verde River in Township 17 North, Range 3 East

Going downstream into township 17 north, range 3 east, there are patents that further demonstrate the Verde River's non-navigability. On June 11, 1914, for example, Timothy P. Sullivan applied for a homestead patent for land lying in section 33 of this township. The Verde River ran through the southwest corner of this parcel, and the patent file underscored this point. Because the tract lay within the boundaries of the Coconino National Forest, it was surveyed by that agency's staff. The field notes of the survey were checked and approved on August 30, 1912, by the Forest Supervisor. In those notes, surveyor Thomas E. McCullough noted that at 19.10 chains, he went

> [a]cross the west edge of area plowed. Twelve chains from [a point I marked] H 4 is the east bank of the Verde River. Corner H 5 is in the running wash of this Verde River and can only be located by intersection or by plane table. . . . [At five chains I went] to the edge of the east bank of the Verde River, up over the bank and thru [sic] thicket of willow and locust. . . .

The plat accompanying the field notes clearly indicated that the Verde River ran directly through the tract. Sullivan's final proof also noted that "[a]ll [land] fenced except *small part river rund thru [sic]*." (Emphasis added.) Despite the fact that the river flowed directly across this land,

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[59] Homestead Entry Patent File 444072, 1913, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 444072, 1914, U.S. Bureau of Land Management, Phoenix, Arizona.

Sullivan received homestead entry patent 793381 in 1921 without reservation of the bed and the banks of the Verde River for Arizona.[60]

At the northern end of township 17 north, range 3 east, the Sycamore Mining, Smelting & Development Company filed a mining patent claim in section 7. Mineral survey 2868 of what was called the "Gold Tooth" claim was undertaken by J.J. Fisher on November 3 and 4, 1910, to determine the legal boundaries of the tract. His survey notes clearly showed that part of the border of the mineral claim had the Verde River flowing through it:

> Beginning at Cor. No. 1, the S.W. Cor. of the location, identical with same, a monument of stones 2.5 ft. base, 1.5 ft. high. This Cor. *being located in the channel of the Verde River*, a point unsuitable for the establishment of a permanent corner, I establish a W.C. hereafter described at N. 10 30' W. 98 ft. dist., thence from true corner point I ran N. 10 30' W. [Emphasis added].

While the survey notes demonstrated that the Verde River flowed through the tract, they also indicated the stream to be forty feet wide and eighteen inches deep.

In approving the mineral claim on February 7, 1913, the Acting District Forester observed that "[t]he Verde river runs through the claim from west to east." And, suggesting the river was not used for transportation, he added that "Verde Valley railroad is on an average of 18' to 20' higher than the river along here." Yet despite the river's presence in the mineral claim, the U.S. patented the land in May 1913, reserving no land for Arizona.[61]

4. Federal Patents on the Verde River in Township 16 North, Range 3 East

Continuing downstream, there are more examples of patents which indicate the Verde River's non-navigability. Forest "in-lieu" selection 264746 lay in sections 17 and 20 of

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[60] Homestead Entry Patent File 793381, 1914, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 793381, 1921, U.S. Bureau of Land Management, Phoenix, Arizona.

[61] Mining Entry Patent File 335072, 1910, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Mining Entry Patent 335072, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

township 16 north, range 3 east, both of which had the Verde River running through them. This parcel had been chosen in 1911 by the Santa Fe Pacific Railroad as an indemnity parcel for railroad grant lands relinquished elsewhere in Arizona (in this case, for the San Francisco Mountains Forest Reserve – today, a part of the Coconino National Forest). Prior to confirming title to the railroad, however, the United States had to determine whether the land had any hydroelectric power possibilities (in which case, such land could not be granted to the railroad), and to that end the General Land Office sent Silas L. Gillan to inspect the property. Gillan reported that "approximately half of the land embraced within these subdivisions is gravelly river bottom and adjacent gravelly bench land." He added:

> The N1/2NW1/4 and SW1/4NW1/4, Sec. 17 is crossed by the Verde River. I roughly estimated the flow of the Verde River on January 17, 1912, at 100 second ft. . . . Based upon a flow of 90 second ft., a figure which probably represents the minimum flow, a quantity sufficient for the generation of about 8 H.P. per ft. of available head, it will be seen that a comparatively high head will be necessary to secure any practicable power development. Reference to the U.S. Geological Survey topographical map [illegible], will show that between Sec. 17 and Packard's ranch, a distance of about nine miles, the fall is less than 200 ft. Above Packard's ranch, the flow in the Verde River is considerably less than 90 second feet, because at this point Sycamore Creek comes in. . . . *The river bed in the northerly portion of Sec. 17 is sandy and gravelly* and is not suitable for the foundation of a dam to hold the Verde River while in flood stages. [Emphasis added.]

Commenting on Gillan's findings, Director of the U.S. Geological Survey George Otis Smith noted that the 90 second feet was "a limited supply of water," and continued that "the fall is hardly sufficient to warrant the development of power by the construction of a dam since there are apparently no suitable reservoir sites in the vicinity."

Not only do the above documents indicate that the Verde River was not navigable, but so too does the fact that the United States patented the 240 acres of land to the Santa Fe Railroad

Company in 1912. No land was reserved for Arizona in the bed and banks of the Verde due to that stream's possible navigability.[62]

Also in section 17 of township 16 north, range 3 east, lay a parcel granted to Willie A. Jordan in 1895. The Verde River flowed directly through this land, and Jordan's patent file made this fact clear. James Jordan, one of Willie Jordan's witnesses (and probably a relative), stated that "[the land] is on the Verde River and south or nearly south of the Fleet Ranch." Nonetheless, the federal government patented this 160-acre parcel on June 24, 1895, without reserving the bed and the banks of the river for Arizona.[63]

5. Federal Patents on the Verde River in Township 15 North, Range 3 East

Like the other townships surrounding it, township 15 north, range 3 east, contains many original patents that demonstrate the non-navigability of the Verde River. For example, James W. Anderson made a homestead application in section 12 for land lying mostly in the southeast quarter of that section. It is clear from historical mapping sources that the Verde River ran through this parcel of land. Nonetheless, on September 3, 1884, Anderson received patent 78 for a total of 160 acres. There is no indication that the U.S. Government reserved any of the bed and banks of the river for Arizona. Although this land eventually reverted back to federal ownership and then was transferred to Arizona, there is no indication that the State claimed the land under its sovereign rights to the beds and banks of navigable streams. Instead, Arizona received this land as part of the federal grant to Arizona of all sections 2, 16, 32, and 36 within the state. (See section below for full discussion of State grants.)

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[62] Forest Lieu Patent File 264746, 1911, Santa Fe Pacific Railroad Company, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Forest Lieu Patent 264746, Bureau of Land Management, Phoenix, Arizona.

[63] Cash Entry Patent File 330, 1887, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Cash Entry Patent 330, 1895, U.S. Bureau of Land Management, Phoenix, Arizona.

North of Anderson's land lay a parcel filed for by Caroline E. Adams. These lands were in a portion of the southwest quarter of section 1, and the Verde River ran through the parcel. Adams wrote to the Commissioner of the General Land Office substantiating this fact. In this 1915 letter, Adams observed that the forty acres upon which she had filed her claim were "cut up considerable by the river and washes and a part of it is a rocky hill." Despite the fact that the some of the land lay in the Verde's bed, the U.S. granted homestead entry patent 680819 to Adams in 1919, reserving no land for Arizona.[64]

6. Federal Patents on the Verde River in Township 15 North, Range 4 East

Other examples of patents being issued for lands through which the Verde River flowed can be found in township 15 north, range 4 east. For instance, homestead entry patent 88173 was granted to Samuel G. Wallingford in 1909. The land lying in the western portion of this parcel in section 33 clearly was in the bed of the Verde River. Nonetheless, Wallingford was granted a patent for the entire acreage, which included adjacent land in the patent in section 4 of township 14 north, range 4 east. No land was withheld for the future sovereign rights of Arizona.[65]

Upstream from Wallingford, Louis Tiszo made a homestead entry on June 15, 1903, for land lying in section 18 in this same township. According to maps showing the Verde around the time of statehood, the river flowed through Tiszo's entire parcel of land. On his final proof – which is located in his patent file – Tiszo wrote that he was "[a]bsent two months in each year, both self and family, on account of high water principally . . . absent in December and January annually." One of Tiszo's witnesses wrote that the family was not present during those months

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[64] Homestead Entry Patent File 680819, 1915, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 680819, 1919, U.S. Bureau of Land Management, Phoenix, Arizona.

[65] Homestead Entry Patent 88173, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

because the "children could not cross river during rainy season [to attend school]." Not only was the Verde River clearly located on the land, but the ability of the children to cross the stream during drier months strongly suggests its non-navigability. Furthermore, no land was withheld from the patent on behalf of Arizona's sovereign right to ownership of the bed and banks of navigable streams. Tiszo was granted the full eighty acres in 1911.[66]

7. Federal Patents on the Verde River in Township 14 North, Range 4 East

Robert M. Rogers filed an application to patent a parcel of land in sections 2 and 3 of township 14 north, range 4 east. Rogers received cash entry patent 238 for the land on December 16, 1889. Though it is clear from historical maps that the Verde River ran directly through Rogers's acreage, none of this parcel was reserved due to Arizona's future sovereign ownership of the bed and the banks of navigable streams.[67]

Similarly, no land was withheld from cash entry patent 149, lying upstream in section four. Instead, this 160 acre parcel of land was patented to Josiah Marr on December 5, 1884. Despite the river's obvious presence in the tract, there is no evidence that any acreage was withheld from the patent for Arizona.[68]

8. Federal Patents on the Verde River in Township 13 North, Range 5 East

This township was one of the earliest areas settled along the Verde River. Although it is not part of the present-day incorporated limits of the town of Camp Verde, the region lies just south of it, and therefore has a history similar in nature. The residents of this part of the Verde

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[66] Homestead Entry Patent File 171435, 1903, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 171435, 1911, U.S. Bureau of Land Management, Phoenix, Arizona.

[67] Cash Entry Patent 239, 1889, U.S. Bureau of Land Management, Phoenix, Arizona.

[68] Cash Entry Patent 149, 1884, U.S. Bureau of Land Management, Phoenix, Arizona.

Valley used the Camp Verde Post Office, and frequently referred to the town as their home. The land in the area was quite fertile and therefore attracted many early homesteaders.

One such person was Joseph H. Morrison. On January 21, 1913, Morrison made a homestead entry application for land lying in and around the Verde River in section 27 of township 13 north, range 5 east. Morrison, however, failed to make his final proof on the land before it was withdrawn for the Coconino National Forest and also for the proposed Camp Verde Reservoir site. In 1918, Morrison applied for reinstatement of his entry. In an October 16, 1920, letter to the Secretary of the Interior regarding this parcel, Arthur Powell Davis of the Reclamation Service quoted the president of the Paradise-Verde Irrigation District (discussed in greater detail later in this report):

> All but two acres of the claim lies below the water line of the proposed Camp Verde Reservoir. About sixteen acres are in cultivation and fifteen acres more capable of irrigation but now unimproved. *The remainder is rough and stony or lies in the river bed.* [Emphasis added.]

On Morrison's subsequent "Application for Reduction of the Required Area of Cultivation," he wrote that

> [t]he north ten acres is a high mesa about 150 feet above the rest of the land – the balance a fairly leval [sic] piece of land except – a part comprising *over twenty acres is river bottom.* Neither the twenty acres in river and 10 acres on mesa can be farmed. [Emphasis added.]

Additionally, a survey plat of the tract completed by C.G. Ricketson in 1920 shows the river clearly as a part of the land in question. Despite all this information explicitly stating that the application included the river bed, the U.S. Government eventually granted patent 844648 to Morrison without withholding the bed and the banks of the river due to the sovereign rights of Arizona.[69]

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[69] Homestead Entry Patent File 844648, 1913, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 844648, 1922, U.S.

Long before Morrison came to the valley, settlement had started in this township with the arrival of Frank Jordan, who received his homestead entry patent in 1886. Jordan's land, located in section 8, also had the Verde River running directly though it. No land was withheld from Jordan's parcel due to the sovereign rights of the future State of Arizona to the bed and banks of the Verde River. He was granted 144.38 acres in patent 134 in 1886. The acreage for this patent is somewhat less than a full quarter section of 160 acres because the Verde River was meandered during a resurvey of the township in 1892-1893. The meanders, however, were not done due to the stream's navigability (see Part III above for details on the meanders).[70]

D. THE *DESERT LAND ACT* OF 1877 AND ITS RELEVANCE TO THE VERDE RIVER'S NAVIGABILITY

In addition to patented lands already discussed, other parcels along the Verde River were claimed under the terms of the *Desert Land Act*. Passed by Congress on March 3, 1877, this law was intended to allow arid lands to be claimed in larger blocks than under other homestead acts because arid acreage was considered less productive (from an agricultural perspective) than more humid lands. The *Desert Land Act* allowed a settler to file an application for up to 640 acres. The relevance of the *Desert Land Act* to the question of the Verde River's navigability lies in the requirement that the desert land being claimed had to be irrigated before a final patent would be awarded. Importantly, the water to be used for that purpose had to be taken from a non-navigable stream:

> Provided however that the right to the use of water by the person so conducting the same, on or to any tract of desert land of six hundred and forty acres shall depend upon bona fide prior appropriation: and such right shall not exceed the amount of water actually appropriated, and necessarily used for the purpose of irrigation and reclamation: and all surplus water over and above such actual appropriation and use, together with the water of all, lakes, rivers and other

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Bureau of Land Management, Phoenix, Arizona.

[70] Homestead Entry Patent 134, 1886, U.S. Bureau of Land Management, Phoenix, Arizona.

> sources of water supply upon the public lands *and not navigable*, shall remain and be held free for the appropriation and use of the public for irrigation, mining and manufacturing purposes subject to existing rights. [Emphasis added.][71]

In short, the *Desert Land Act* stated that lands patented under this statute had to be reclaimed through water obtained by prior appropriation from a non-navigable stream. Subsequent court interpretations have confirmed that waters used to "prove up" *Desert Land Act* entries had to come from non-navigable streams. For example, in 1935 the U.S. Supreme Court held that any state's right to regulate waters within its borders was subject to the U.S. Government's power "to secure the uninterrupted navigability of all navigable streams within the limits of the United States."[72] Thus, the ability to appropriate water from any stream in Arizona to satisfy the *Desert Land Act*'s requirement for irrigation meant that the water so diverted had to come from a non-navigable waterway.

The requirements of the *Desert Land Act* shed light on the navigability or non-navigability of the Verde River. There were over fifty applications for land under the *Desert Land Act* in lands adjacent to the Verde River, many of which cited that stream as their source of water. All of the applications were initially accepted by the U.S. General Land Office in Phoenix. The logical conclusion from these applications is that the Verde River (as the source of irrigation water for these lands) must have been considered non-navigable by the applicants as well as by the administrators of the U.S. General Land Office. Although many of the applications were subsequently cancelled or relinquished due to failure to fulfill the *Desert Land Act*'s requirements, the mere fact that the applications were initially accepted indicates a contemporaneous belief that the Verde River was not navigable. There is no indication the cancellations and relinquishments were due to the navigability of the Verde River.

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[71] *An Act to Provide for the Sale of Desert Lands in Certain States and Territories*, 19 Stat. 377 (1877).

[72] *California Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U.S. 142 (1935) at 159. See also *California v. United States*, 438 U.S. 645 (1978) at 663.

1. *Desert Land Act* Entries Overlying the Verde River in Township 15 North, Range 4 East

At least two of the desert land entries filed in the Verde River area not only cited the Verde as the source of water, but those applications also covered lands with the stream running through them. For instance, on December 11, 1911, Dea Mee Get applied for a desert land entry patent for land in section 18 of township 15 north, range 4 east. The Verde River not only ran through a large portion of this claim, but Get also declared that he would reclaim this land with water from the Verde River. Land Agent A.A. Wilhelm wrote a favorable report on Get's application on a March 5, 1914, which subsequently was added to Get's patent file. Wilhelm stated that "the water right consists of an appropriation from the Verde River, which is said to be perennial and it is believed the water appropriated is sufficient to permanently reclaim the entry." Get's final proof stated:

> The Verde River runs beside the land or adjoining it. . . . The Verde River [is my source of water], I can pump upon my land about 250 gals per minute. I acquired water right under the State law on waters.

This patent file is important in many respects. First, the fact that the U.S. patented this land despite the fact that the Verde River ran through it suggests that the U.S. Government did not believe the stream to be navigable. No acreage was removed for the sovereign rights of Arizona to the bed and the banks. Second, the claimant declared the Verde River as the source of water, and the *Desert Land Act* required that water to be from a non-navigable stream. On October 29, 1914, Get was granted patent 439098 for forty full acres.[73]

Just north of Get's land lay another parcel of prime land also in section 18 of township 15 north, range 4 east. On February 11, 1914, Ada D. Andrews filed a desert land application for

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[73] Desert Land Entry Patent File 439098, 1911, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Desert Land Patent 439098, 1914, U.S. Bureau of Land Management, Phoenix, Arizona.

this parcel through which the Verde River flowed. On the application, Andrews stated that the land

> borders on the Verde River and that *there is through or upon said land Verde River*; that said land is not naturally irrigated or watered, nor overflowed at any season of the year by the foregoing or any other natural stream, spring, or other body of water; that I expect to obtain my water supply to irrigate said land from Verde River by pumping and canals and ditches. [Emphasis added.]

Almost four years later, Andrews stated on the final proof that "Verde River passes through land," and witnesses concurred.

In January, 1919, the U.S. General Land Office investigated the application, and a special agent submitted a report recommending that the patent be issued. In the report, the agent wrote that

> *[t]he Verde River passes through said described lands*. The 13-acre tract is on the south side of the river. . . . [The main ditch] has been constructed to irrigate all the irrigable land south of the river. The ditch in question has never been used, but Andrews advised me that he intended to remove his engine and pump and irrigate all irrigable land in the approximately three forties on the south side of the river. [Emphasis added.]

Despite the obvious fact that the Verde River flowed through this claim, the U.S. nonetheless patented the land to Andrews without reserving the bed and the banks for Arizona. Even more telling, however, was the fact that the Verde River was stated to be the source of water to reclaim this tract – a statement that only would have been possible had the stream been considered non-navigable.[74]

The history of *Desert Land Act* entries along the Verde River supports the evidence from homestead and cash entry patents that the Verde River was not considered navigable by contemporaneous observers. No mention was made in the *Desert Land Act* applications of

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[74] Desert Land Entry Patent File 717758, 1914, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Desert Land Patent 717758, 1919, U.S. Bureau of Land Management, Phoenix, Arizona.

reserving the bed and the banks of the Verde River for Arizona due to the sovereign rights of the state for those parcels overlying the river. Moreover, the fact that over fifty desert land entries cited the stream as a source of water indicates that many individuals thought the stream not to be navigable. In fact, the evidence indicates that all contemporaneous observers considered the Verde to be non-navigable.

E. FEDERAL LAND GRANTS TO THE STATE OF ARIZONA

Arizona, like other public domain states, obtained land by Congressional grants to support certain public interest objectives prior to and following statehood. Historically, such grants to new states had started with Ohio's admission to the Union in 1802, although over the years the types and sizes of the grants varied from state to state. Grants to Arizona covered a variety of purposes. For example, prior to statehood, Congress reserved for Arizona all sections 16 and 36 for the purpose of supporting public schools. At statehood, sections 2 and 32 were added (also for schools), with all four sections totaling 8,093,156 acres throughout the State. In addition to this land, 1,446,000 more acres were given to Arizona instead of the internal improvement, swamp, saline, and agricultural college grants provided to earlier states. Moreover, one million acres were granted to Arizona to pay for bonds issued by certain counties.[75]

Aside from sovereign lands (which were determined by navigability and not by an act of Congress) and lands in sections 2, 16, 32, and 36, Arizona was allowed considerable leeway in selecting the other federally granted lands. In addition, Arizona had flexibility in selecting "in-lieu" or indemnity acreage if mineral lands (which were denied to the State), Indian reservations, or other conflicting claims overlay any section 2, 16, 32, or 36. Likewise, if a navigable body of

[75] Paul W. Gates, *History of Public Land Law Development* (Washington, D.C.: Zenger Publishing Co., Inc., 1968), pp. 314-316.

water overlay any of these four sections, Arizona could take lands elsewhere equal in size to the total area of the bed of the body of water. Significantly, Arizona made no in-lieu selections to compensate for the area covered by the Verde River's bed in sections 2, 16, 32, and 36 or in other federal lands granted to the State where they overlay the Verde.

There are several places along the Verde River where sections 2, 16, 32, or 36 have the stream running through them. One example is in township 16 north, range 3 east, which has the Verde flowing through the northwestern corner of section 16. Arizona could have selected in-lieu lands to replace those covered by the Verde due to a "double" claim, if in fact the river had been considered navigable. No such lands were selected, however, thus demonstrating that in relation to this section State officials did not consider the stream to be navigable. Comparable circumstances apply to the other sections 2, 16, 32, or 36 through which the Verde River flowed.

F. STATE DISPOSITION OF FEDERALLY-GRANTED LANDS

In the years following statehood in 1912, Arizona's officials confronted the daunting task of disposing of millions of acres given to the state by Congress for various purposes. To do this, the Arizona State Legislature created an initial version of the Public Land Code in a special 1915 session, which laid out the manner in which the State would dispose of its public land. The basic procedure established by the code was to advertise the proposed sale of State land for at least ten consecutive weeks in a newspaper regularly circulated in Phoenix, send an appraiser to the parcel to make a report and set a minimum price, and then sell the acreage to the highest bidder. The purchaser would receive a certificate of purchase, indicating his or her promise to pay any balance in addition to state taxes. Once full payment had been received, an Arizona State patent was issued.

This section of the report will demonstrate that Arizona officials did not consider the Verde River to be navigable when granting title to parcels through which the stream flowed to private parties. The discussion centers around the land in section 12 of township 15 north, range 3 east, which is the only area where Arizona granted patents to lands through which the Verde ran. (For the location of State patents discussed here, see Exhibit 7 below.) Information about State patents is derived from the State patents themselves and related State patent files at the Arizona State Land Department.

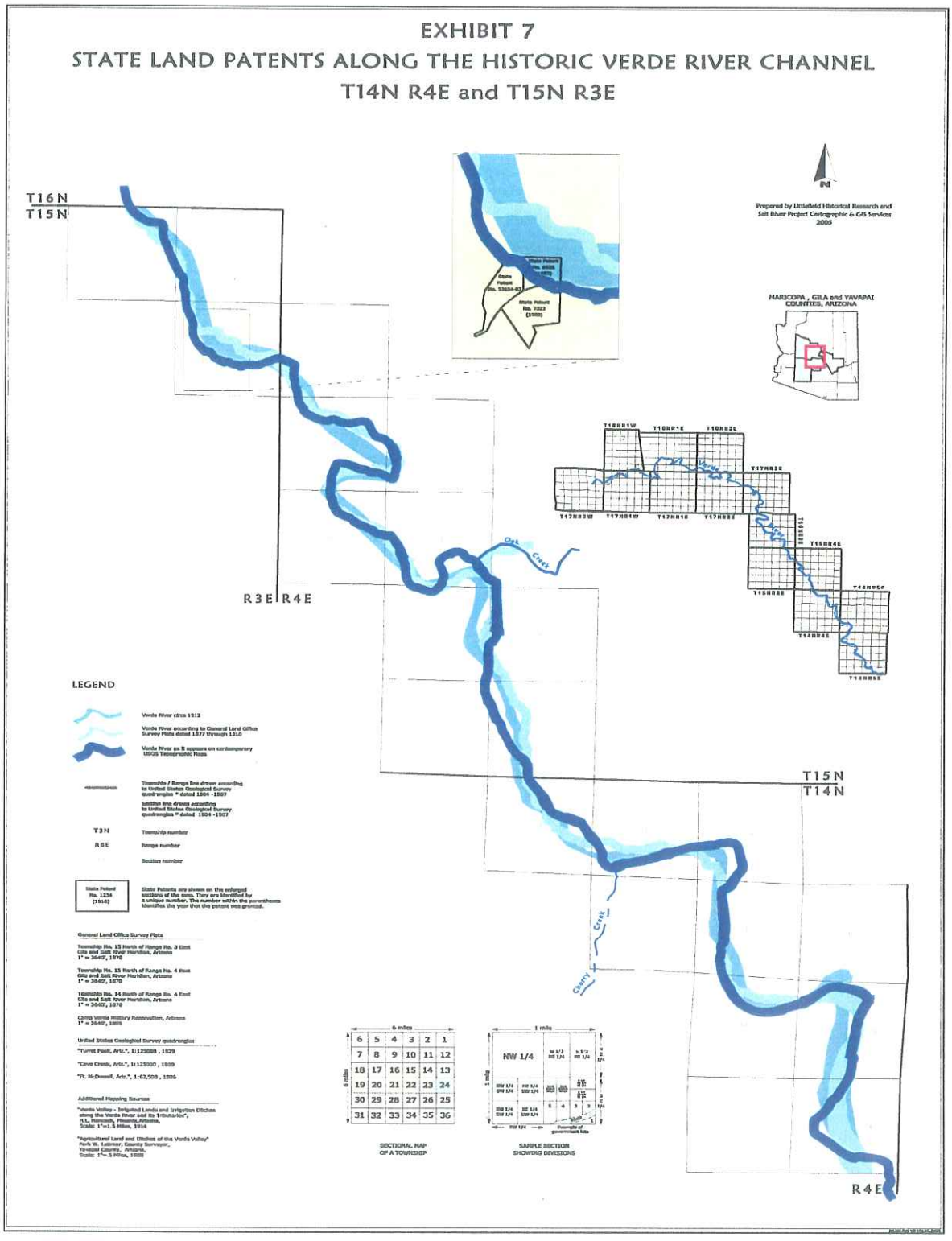

Figure 49. Exhibit 7, State Land Patents along the Historic Verde River Channel – T14N, R4E and T13N, R3E, Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005

1. State Patents in Township 15 North, Range 3 East

It is unclear why the State of Arizona obtained the lands located in the southwest quarter of section 12 of township 15 north, range 3 east, since that land was originally patented by the U.S. Government to James W. Anderson (see above). However, it *is* unmistakable that once the State received the lands, it subsequently sold them to private parties. The three State patents which touch the Verde River in section 12 (53654, 6938, 7323) were all sold to Verde Valley Manor Retirement Center at various dates during the 1980s. There is no indication that the State attempted to retain any portion of the lands due to their location in the bed of the Verde River.

G. CONCLUSIONS REGARDING FEDERAL LAND PATENTS TO PRIVATE PARTIES, GRANTS TO THE STATE OF ARIZONA, AND STATE PATENTS

In conclusion, the U.S. Government granted over one hundred separate patents that touched or overlay the Verde River to private individuals. In not one case did any of these patents or the supporting patent files indicate that acreage was being withheld due to possible ownership of the bed of the Verde by the State of Arizona. In each case where patents were applied for, several parties expressed implicit opinions on the navigability of the Verde through the request for and award of lands through which the river flowed. These included the patentee, his witnesses, and officials of the U.S. General Land Office. It is significant that cumulatively, literally hundreds of people made judgments concerning the Verde River's navigability in this manner – opinions spread chronologically over many years, throughout different seasons, and over a large geographic area.

The patents issued by the State to private parties for land through which the river ran provided another perspective. If the State believed it owned the bed and banks of the river, it certainly would have considered the stream's navigability in disposing of those lands.

Collectively, therefore, federal patents, Congressional grants to Arizona, and State patents strongly suggest that both U.S. Government and State officials did not perceive the Verde River to be navigable.

V. U.S. GOVERNMENT HISTORICAL RECORDS – REPORTS AND OTHER DOCUMENTS

Although U.S. Government survey records and documents relating to federal and state patents are crucial to understanding perceptions of the Verde River prior to and in 1912, other federal records – both published and unpublished – provide a wealth of supplemental information concerning that stream. Two of the most important U.S. agencies concerned with the Verde River region – both of which were heavily involved in the development of water resources in the American West in the late nineteenth and early twentieth centuries – were the Geological Survey and the Reclamation Service (today, the Bureau of Reclamation). Their records paint vivid pictures of the Verde River before and at the time of Arizona statehood. In addition to these water agencies, another federal agency whose records reveal the nature of the Verde River is the Office of Indian Affairs (now, the Bureau of Indian Affairs). The Verde River flowed through or near Indian reservations, and thus there is a considerable body of documentation concerning the river and its impact on Indian life available in Office of Indian Affairs records.

Because of the importance of the records of the Geological Survey, the Reclamation Service, and the Office of Indian Affairs, those agencies' documents will be discussed in detail in this report. There were, however, other federal agencies whose responsibilities brought them into contact with the Verde River. For example, the files of the Office of the Secretary of the Interior (the "parent" to the Geological Survey, Reclamation Service, and the Office of Indian Affairs) also contain descriptions of the Verde River. Although records of the Secretary of the Interior were thoroughly reviewed for this report, the characterizations of the Verde River in

those documents essentially duplicate those of the Geological Survey, the Reclamation Service, and the Office of Indian Affairs. Therefore, to avoid needless repetition, only the latter three agencies' papers will be discussed here. That review will cover representative examples of thousands of pages of documents all substantiating that the Verde River was never considered to be a reliable means of navigation.

A. RECORDS OF THE U.S. GEOLOGICAL SURVEY

The U.S. Geological Survey and its predecessor agencies had started recording commentary concerning the West's water resources as early as the 1870s. Some of the earliest Geological Survey records of the Verde River can be found in the documentation for the Wheeler Survey, the Geological Survey's annual reports and water supply paper series, and in the agency's unpublished records.

1. The Wheeler Survey

In 1872 the United States Army – whose topographical engineers became part of the Geological Survey in 1879 – sent George M. Wheeler to obtain information on Arizona and Nevada and to assess the region's resources, climate, and other qualities that might affect homesteaders, military expeditions, mining ventures, and other concerns. (Although this study of the West was conducted under the direction of the Army, Wheeler's records are contained in those of the Geological Survey.)

Following his exploration of the region, Wheeler submitted a report to Congress containing a daily record of the journey as well as descriptions of what he encountered along the way. In his diary, Wheeler mentioned several streams in Arizona, including the Verde, the Gila, and the Salt. None of these, however, were described as being navigable, although navigability was certainly a characteristic Wheeler would have noted given his discussion of another Arizona

river – the Colorado. In a section of his report entitled "Means of Communication," Wheeler noted that navigation on the Colorado had taken place as far upriver as Camp Mohave (upstream from Yuma near present-day Bullhead City).[76] Yet Wheeler was pessimistic about reliable river transport anywhere in the West, including on the Colorado:

> One of the urgent wants felt in the promotion of our mining industry is that of increased and cheapened inland transportation. River transportation upon our western coast is, to a great extent, a failure, as beyond the Columbia and Colorado Rivers, that furnish somewhat irregular avenues of connection with the interior, no streams of considerable magnitude exist; river transportation, even in this very American age, loses its great power when pitted against railroads.[77]

2. U.S. Geological Survey *Annual Reports*

Following the Wheeler Survey, the U.S. Geological Survey became more directly involved in examining water resources in the West. In 1888, the Geological Survey's director, John Wesley Powell (who, in earlier years, had gone down the Colorado River – to be discussed later in this report), began what became known as the "Powell Irrigation Survey." Essentially a study of arid lands in the West that might be reclaimed by storing and diverting water from the region's streams, Powell's work led to increasingly frequent commentary in the Geological Survey's records regarding water resources throughout the western part of the United States.

The yearly reports drafted by the Geological Survey contain detailed information on many streams in the West, including the Verde River. For example, part II of the *Eleventh Annual Report of the United States Geological Survey to the Secretary of the Interior, 1889-1890* included a section devoted solely to streams in the entire Gila Basin, which includes the Verde.

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[76] Camp Mohave (also called Camp Colorado and Fort Mohave) was established by the U.S. Army in 1859 at Beale's Crossing on the Colorado River. It was closed in 1935.

[77] George M. Wheeler, *Report on Exploration of the Public Domain in Nevada and Arizona*, House Ex. Doc. 65, 42nd Cong., 2 sess. (Washington, D.C.: U.S. Government Printing Office, 1872), pp. 17-19, 53.

John Wesley Powell, who wrote the report, noted the characteristics of the Gila and its tributaries:

> In this basin are found rivers most difficult and dangerous to examine and control, differing in character and habit from those of the north as widely as in geographic position. In place of the regularly recurring annual floods of spring and early summer, so strongly marked on the discharge diagrams of other basins, these rivers [of the Gila Basin] show conditions almost the reverse, being at that season at their very lowest stages – even dry – and rising in sudden floods at the beginning of and during the winter. These floods are of the most destructive and violent character; the rate at which the water rises and increases in amount is astonishingly rapid, although the volume is not always very great. . . . From this it will be recognized that the onset of such a flood is terrific. Coming without warning, it catches up logs and bowlders [sic] in the bed, undermines the banks, and, tearing out trees and cutting sand-bars, is loaded with this mass of sand, gravel, and driftwood – most formidable weapons for destruction.[78]

Powell made no exception to this description, and thus the characterization of the basin as a whole presumably applied to the Verde River as well as all other tributaries of the Salt and Gila. Such violent fluctuations in flow, carrying with them destructive debris, would be an anathema to navigation. Furthermore, such variations would provide an unreliable channel for the purposes of transportation or for recreation.

The *Twelfth Annual Report of the United States Geological Survey* reiterated the nature of Gila Basin streams, only this time they were specifically listed by name. Describing the Verde, Salt, Hassayampa, San Pedro, and Agua Fria as sources of potential irrigation water, the report stated that:

> water is derived from the Gila River and its tributaries by means of canals and ditches, which distribute it to the fields of each farmer. These streams fluctuate greatly, being at times subject to sudden floods, especially during summer rains, when they often sweep out bridges, dams, and canal head words, while at other times they may diminish until the water almost disappears.[79]

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[78] *Eleventh Annual Report of the United States Geological Survey to the Secretary of the Interior, 1889-1890, Part II-Irrigation* (Washington D.C.: U.S. Government Printing Office, 1891), p. 58.

[79] *Twelfth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1890-91, Part II-Irrigation* (Washington D.C.: U.S. Government Printing Office, 1891), p. 292.

The dramatic fluctuation that typified the entire Gila Basin was more specifically noted in the *Eighteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1896-97*. This volume carried a table showing the Verde River's monthly discharge at its mouth. According to the table, in January 1895 the maximum discharge had been 33,000 cubic feet per second, while the minimum had been only 527 cubic feet per second.[80]

The *Nineteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1897-98* further confirmed the agency's determination that the Verde River was highly erratic in flows. The author of the report wrote that the bed of the Verde at McDowell station, approximately a half mile above the stream's mouth

> is similar to the one of Gila River – sandy and liable to change during a slight rise. . . . The bed of the river evidently changed during the last freshet, scouring out [the channel]. . . . The river fluctuated in this channel until August 23.[81]

3. U.S. Geological Survey Water Supply Papers

Aside from its annual reports, the U.S. Geological Survey also published a series of research treatises known as "Water Supply Papers." While these studies dealt with specific topics and geographic areas, some examined subjects which shed light on the nature of the Verde River prior to or at the time of Arizona's statehood. The Water Supply Papers further confirm the undependable and unpredictable nature of the stream. A number of these studies detailed the widely fluctuating flow of the Verde through tables. These indicated that at some times of year the stream had less than 100 cubic feet per second in it, while at other times flows could exceed 100,000 cubic feet per second.[82]

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[80] *Eighteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1896-97, Part IV-Hydrography* (Washington D.C.: U.S. Government Printing Office, 1897), p. 297.

[81] *Nineteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1897-98, Part IV-Hydrography* (Washington D.C.: U.S. Government Printing Office, 1899), p. 420.

[82] Arthur P. Davis, *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 66 (Washington D.C.: U.S. Government Printing Office, 1902); Arthur P. Davis, *Water Storage*

In addition to detailing the unpredictable flows of the Verde in tables, the U.S. Geological Survey's Water Supply Papers also offered textual descriptions of the stream's characteristics. For instance in 1902, the Chief Engineer of the newly formed Reclamation Service, Frederick H. Newell, observed in Water Supply Paper No. 85 that the "channel [of the Verde River] is similar to that of Salt River – sandy and liable to change during a slight rise."[83] The following year, in Water Supply Paper No. 73, Arthur Powell Davis (who succeeded Newell as Reclamation Service Chief Engineer in 1906) offered a more detailed picture of the Verde River:

> Verde River drains the central portion of Arizona, and Upper Salt River the east central portion. Both streams are more or less torrential in character, the combined flow dwindling at times to about 100 cubic feet per second, and at other times reaching a volume more than one hundred times as great. . . . [T]he greater portion of the basin, however, is of a mountainous character, being cut with profound canyons and dotted by rugged mountains. . . .[84]

The following year, John C. Hoyt added further detail about the nature of the Verde River in Water Supply Paper No. 100. Commenting on the nature of the stream at Camp McDowell, Hoyt noted that:

> at low water the channel is oblique to the gaging section and measurements are made by wading at a point 400 feet above the cable. The channel is straight for a distance of 300 feet above and below the station, and has a width at low water of 100 feet and at high water of 450 feet. The current is swift. The right bank is

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On Salt River, Arizona, U.S. Geological Survey Water Supply Paper No. 73 (Washington D.C.: U.S. Government Printing Office, 1903); Frederick H. Newell, *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 75 (Washington D.C.: U.S. Government Printing Office, 1903); John C. Hoyt, *Report of Progress of Stream Measurements for the Calendar Year 1903, Part IV. Interior Basin, Pacific, and Hudson Bay Drainage*, U.S. Geological Survey Water Supply Paper No. 100 (Washington D.C.: U.S. Government Printing Office, 1904); R.I. Meeker, et al., *Surface Water Supply of Colorado River Drainage Above Yuma*, U.S. Geological Survey Water Supply Paper No. 211 (Washington D.C.: U.S. Government Printing Office, 1908); W.B. Freeman, et al., *Surface Water Supply of the U.S. 1907-8, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 249 (Washington D.C.: U.S. Government Printing Office, 1910); W.B. Freeman, et al., *Surface Water Supply of the U.S. 1909, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 269 (Washington D.C.: U.S. Government Printing Office, 1911).

[83] Frederick H. Newell, *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 85 (Washington D.C.: U.S. Government Printing Office, 1903), p. 21.

[84] Arthur P. Davis, *Water Storage On Salt River, Arizona*, U.S. Geological Survey Water Supply Paper No. 73 (Washington D.C.: U.S. Government Printing Office, 1903), pp. 9, 13.

> high, rocky, clean, and is not subject to overflow; the left bank is low, clean, and is subject to overflow. The bed of the stream is composed of sand and is shifting.[85]

In 1911, Water Supply Paper No. 269 confirmed that the bed of the Verde at Camp McDowell was "sandy and shifting."[86] And, in commentary revealing the irregular nature of the stream's flows, that Water Supply Paper added that:

> [f]rom June 11 to July 20, excepting July 6, measurements were made about 500 feet above cable by wading. Water too shallow at cable to make an accurate measurement. Beginning July 23, measurements were resumed from the cable.[87]

Additionally, Water Supply Paper No. 329 reported that in the year of Arizona's statehood, records measuring the Verde's flow had been made at three gauging stations, one near Camp Verde (at Camp Childs), one actually at Camp Verde, and one downstream at Camp McDowell. At the first two stations, the channel was recorded as being mostly of sand and clay, and of a shifting nature. The station near Camp Verde, however, recorded that the channel "appears fairly permanent." Nevertheless, indicating the river's shallow nature, even at the Camp Childs measuring station some of the measurements had to be taken by wading across the stream (as they also had been done at the other stations at times).[88]

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[85] See generally John C. Hoyt, *Report of Progress of Stream Measurements for the Calendar Year 1903, Part IV. Interior Basin, Pacific, and Hudson Bay Drainage*, U.S. Geological Survey Water Supply Paper No. 100 (Washington D.C.: U.S. Government Printing Office, 1904), pp. 31-36.

[86] W.B. Freeman, et al., *Surface Water Supply of the U.S. 1909, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 269 (Washington D.C.: U.S. Government Printing Office, 1911), p. 230.

[87] W.B. Freeman, et al., *Surface Water Supply of the U.S. 1909, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 269 (Washington D.C.: U.S. Government Printing Office, 1911), p. 231.

[88] Robert Follansbee, et al., *Surface Water Supply of the U.S., 1912-Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 329 (Washington D.C.: U.S. Government Printing Office, 1914), with quotation at p. 227.

4. Unpublished Records of the U.S. Geological Survey

Aside from the published reports and Water Supply Papers created by the Geological Survey, the agency also generated other documents shedding light on the nature of the Verde River prior to and about the time of Arizona's statehood.

The unpublished records of George M. Wheeler that led to his published report to Congress in 1872 (see above) provide yet more information about the nature of the Verde River prior to Arizona's statehood in 1912. Wheeler's draft "Progress Report Upon Geographical and Geological Explorations and Surveys West of the 100th Meridian in 1872" observed that:

> [t]here are three streams whose navigability gives them more or less importance as commercial lines, namely: the Columbia, the Sacramento, and the Colorado rivers. [Wheeler had reduced the number of navigable streams to two in his final report to Congress – see above] The limit of navigation of these streams for freight carrying vessels, has already been determined and from it, is deduced the conclusive fact that except for their advantages as an assistance to local interior traffic, and as the possible adjunct to trans-continental routes, that the standard for their usefulness has been fixed: which usefulness is governed by the rates of increase of commerce from the ports at their mouths to and from the head of navigation in each case.[89]

Aside from the Wheeler Survey documents, other U.S. Geological Survey unpublished records also illustrate the nature of the Verde River. One particularly revealing unpublished report prepared for the Geological Survey was undertaken by E.C. Murphy to determine potential hydroelectric power sites within Arizona. Although written shortly after Arizona joined the Union, Murphy's report was based on data accumulated for many years prior to statehood, and it had been done to conform with provisions of the 1910 enabling act allowing Arizona to take steps to join the Union. That law, however, also prevented the future new State from selecting parcels valuable as hydroelectric power sites as part of acreage granted to Arizona

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[89] George M. Wheeler, "Progress Report upon Geographical and Geological Explorations and Surveys West of the 100th Meridian in 1872," p. 256, Report on Wheeler Survey in 1872, box 1, Entry 20, Records of the U.S. Geological Survey, Record Group 57, U.S. National Archives II, College Park, Maryland.

by Congress. Murphy's report was the result of an investigation to locate those hydroelectric power sites so the United States could retain them.[90]

Murphy's report was divided into three parts. These were an introduction, a section dealing with the Gila River, and a section covering the Salt River and its tributaries. Murphy noted that obtaining data on runoff on various streams was very difficult, but he nonetheless had been able to utilize some of the records of the Reclamation Service, the Arizona State Land Office, the Forest Service, and the Indian Irrigation Service. He also had consulted with county surveyors and engineers, and had visited many locations on horseback, on foot, or by wagon.

Regarding the Verde River, Murphy wrote that there was a long set of runoff data at Camp McDowell covering 1889-1914. The data, Murphy noted, indicated that there was an extreme variation in the Verde's flow on a monthly basis, with the highest rate of flow taking place in March (with a twenty-six-year average of 121,600 acre-feet) to a low in June (with an average of 8,700 acre-feet). Murphy observed that the "great variation in the annual run-off of streams in the Southwest is well illustrated" by these figures.[91]

Further indicating the erratic nature of the Verde was Murphy's discussion of the impact of silt on hydroelectric power possibilities. In this context, he commented that "only a comparatively small part of the run-off can be utilized for power on account of the floods and long dry periods – one-fifteenth to one-fifth in the case of the Verde River[.]"[92]

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[90] Each main part to Murphy's report was re-paginated beginning with page one. Therefore, all citations to his report will include the section as well as page number. See E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Introduction, pp. 4-5, Salt River Project Archives, Phoenix, Arizona.

[91] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Introduction, p. 13, Salt River Project Archives, Phoenix, Arizona.

[92] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Introduction, p. 17, Salt River Project Archives, Phoenix, Arizona.

B. RECORDS OF THE U.S. RECLAMATION SERVICE (BUREAU OF RECLAMATION)

Following Congress's enactment of the 1902 *Reclamation Act*,[93] many of the water resource duties formerly carried out by the hydrographic branch of the U.S. Geological Survey were transferred to the young U.S. Reclamation Service. Under the terms of the *Reclamation Act*, the new agency also was charged with the responsibility of selecting reservoir locations throughout the American West and constructing dams and irrigation canals at those sites. It was under this latter mandate that the agency planned the Salt River Project, including the construction of the major storage facility, Roosevelt Dam, and the related diversion dam, Granite Reef, on the Salt River. While these structures were on the Salt, part of the conception for the project, however, included utilizing the flows of the Verde River. In addition, the Reclamation Service undertook separate studies to determine the feasibility of building storage facilities on the Verde River, both for the Salt River Project as well as for the Paradise-Verde Project (the latter of which was never built, although some of its proposed reservoirs were incorporated into the Salt River Project). Since much of the work on the Salt River Project as well as the investigations of the Verde took place in the decade preceding Arizona's statehood, the Reclamation Service's records are extremely useful for determining the nature of the Verde River around that time.

1. U.S. Reclamation Service *Annual Reports*

Like the Geological Survey, the Reclamation Service issued annual reports describing its activities, and these contain valuable descriptions of the Verde River.

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[93] *An Act Appropriating the Receipts from the Sale and Disposal of Public Lands in Certain States and Territories to the Construction of Irrigation Works for the Reclamation of Arid Lands*, 32 Stat. 388 (1902).

Understandably, with Roosevelt Dam planned to be the principal storage facility for the Salt River Project and with that venture to be located in the Salt River Valley, most of the annual reports' discussions of Arizona's streams focused on those areas. Nevertheless, the *First Annual Report of the Reclamation Service, from June 17 to December 1, 1902* commented on the nature of the Verde in the context of that stream being a tributary to the Gila:

> The sources from which water may be obtained for reclamation of the arid lands in Arizona are, taken as a whole, the most erratic or irregular in the entire country. There are comparatively few rivers which flow throughout the year.[94]

The *Third Annual Report of the Reclamation Service, 1903-4* provided greater detail about planning for the Verde River and the nature of that stream. Noting that that stream was much "fresher" and that "the flow in the river is but slightly less" than the Salt, the report pointed out that two possible dam locations had been investigated on the Verde. These were the Horseshoe and McDowell sites, and the report added that more investigations and estimates were underway to determine which location was the most practicable. Nevertheless, the report gave no indication that either of these proposed structures might impede navigation on the Verde River.[95]

2. Unpublished Records of the U.S. Reclamation Service

Like the *Annual Reports* of the U.S. Reclamation Service, the agency's unpublished documents further depicted the Verde River as highly unpredictable and not useful for navigation. While these files contain many documents describing the Verde River and proposals for dams on that stream – none of which indicate that the river was a reliable means of navigation – representative examples are provided here.

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[94] *First Annual Report of the Reclamation Service, from June 17 to December 1, 1902* (Washington D.C.: U.S. Government Printing Office, 1903), p. 76.

[95] *Third Annual Report of the Reclamation Service, 1903-4* (Washington D.C.: U.S. Government Printing Office, 1905), p. 155.

Early discussions over the possible construction of Horseshoe Reservoir on the Verde River was especially revealing in relation to the navigability or non-navigability of that stream. In a 1911 letter, Reclamation Service Director Frederick H. Newell wrote to engineer Louis C. Hill that if the Service continued with plans for Horseshoe Reservoir, it would likely cause controversy over which lands were to be included in the Salt River Project due to the large storage capacity that Horseshoe Reservoir would provide. In his letter to Hill, Newell did not indicate that any objections might arise to building the storage facility due to any possible detrimental impact on the navigability of the river. He did, however, explain his concern about a movement among Salt River Project water users to seek an extension of time to repay construction costs and how he thought that issue related to when Horseshoe Reservoir might be built. As Newell explained to Hill:

> We have already brought under irrigation a greater part of the land [in the Salt River Valley], but I understand that it will be necessary in the near future to exclude certain good lands and to definitely indicate which areas are to be irrigated, and which are to be thrown out. The doing of this will be difficult and disagreeable, will create many disappointments and arouse much antagonism; nevertheless it must be done. The people whose lands are excluded from irrigation will naturally turn at once to the question of an additional supply from the Horseshoe reservoir, and in my opinion, they should have fully in mind the fact that this will not be built until substantial repayments have been made by the lands irrigated. It seems to me wise to consider the making of tentative plans for the Horseshoe reservoir, with preliminary estimates of probable costs, and at the same time shut down all extension of the work until substantial repayments have been made.[96]

Horseshoe Reservoir continued to be controversial for many years, including those following Arizona's statehood in 1912. A large number of the documents chronicling the debate over the reservoir, although created after 1912, continued to shed light on whether the Verde was navigable prior to that time. For example, on March 13, 1914, Reclamation Service officials

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[96] F.H. Newell to L.C. Hill, Nov. 25, 1911, "Salt River Project, Consulting Engineer Reports, January 1, 1907 - December 31, 1912," General Administrative and Project Records, 1902-1919, Entry 3, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives-Rocky Mountain Region, Denver, Colorado.

held a public meeting in Phoenix with water users under the Salt River Project to discuss additional ways to develop more water for use in the Salt River Valley. Topics proposed included pumping and the construction of a reservoir on the Verde River in the Paradise Valley. Four days after the meeting, Reclamation Service officials wrote to the Secretary of the Interior detailing the outcome of the meeting, and the letter noted that there had been concern on the part of Paradise Valley residents regarding the proposed Verde River reservoir that its purpose was to increase acreage within the Salt River Project at the expense of available water supplies from the Verde River for the Paradise Valley. The Reclamation Service letter pointed out that the agency intended to print a public announcement that the water to be stored at the proposed Verde reservoir was only to supply 20,000 acres already being served under the Salt River Project that could not obtain adequate water from existing project sources. While the Reclamation Service letter clearly addressed misapprehensions by Paradise Valley water users that "their" water might be taken to irrigate large new areas of the Salt Valley, the letter contained no indication that there had been any opposition by navigation interests in the Verde Valley to the proposed reservoir during the many years the reservoir had been under consideration.[97]

Less than a month after the public hearing on ways to increase the Salt River Project's water supplies, Reclamation Service official F.W. Hanna responded to a letter he had received from G.F. Hart, President of the Paradise-Verde Water Users' Association. Hart had written on behalf of his constituents, who had requested that the federal government build a reservoir on the Verde River to irrigate their lands in the Paradise Valley. Hanna, in his response, informed Hart that the proposed Horseshoe Reservoir, if built, was designed to help regulate Verde River natural flow water already being used by farmers in the Salt River Valley – not the Paradise

[97] A.P. Davis, et al., to the Secretary of the Interior, March 17, 1914, "Salt River Project. Board of Survey Reports. 544-D," General Administrative and Project Records, 1902-1919, Entry 3, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives-Rocky Mountain Region, Denver, Colorado.

Valley. Hanna claimed that Horseshoe Reservoir would be used to supplement storage at Roosevelt Dam. Nevertheless, flows of the Verde River were so irregular, according to Hanna, that Horseshoe Reservoir itself could not be relied upon alone, and therefore it was unsuitable as storage for the Paradise Valley. Hanna enclosed a table which showed that:

> there are several years in which there would be absolutely no water available for storage. Moreover in the series of years from 1896 to 1904, inclusive, there are four years, three of which are consecutive, in which there would be no water supply for storage in the Horseshoe Reservoir, and there would be very little available water for the whole period of nine years. It appears, therefore, that the water supply even though the Horseshoe Reservoir is not constructed for the Salt River Project would be very unreliable for additional lands which would have to depend upon this source of supply alone.[98]

Hanna's letter – as well as a significant body of subsequent documentation concerning the Horseshoe Reservoir proposal for the Verde River – underscored the highly erratic nature of the Verde River. The letter and other documents also demonstrated that even though planning for Horseshoe Reservoir had been underway for some time and was to continue for many more years, there never had been and would not be any objections to blocking the river for navigation by this major storage facility.

C. RECORDS OF THE U.S. OFFICE OF INDIAN AFFAIRS

The Office of Indian Affairs administered the Salt River and the Camp McDowell Indian reservations, through both of which the Verde River flowed. Federal Indian policy in the late nineteenth and early twentieth centuries was aimed at assimilating Indians into American society by training them in occupations such as farming. As a result, U.S. officials overseeing Indian reservations devoted a great amount of time to water resource development to facilitate irrigation on reservations. Visiting Indian Office inspectors and the U.S. Indian agents at the Salt River

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[98] F.W. Hanna to G.F. Hart, April 11, 1914, file Arizona Surveys & Investigations, Paradise Valley (Verde River) thru May 1918, Box 299, Entry 3, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch, Rocky Mountain Region, Denver, Colorado.

and Camp McDowell reservations, therefore, created a considerable body of unpublished documentary evidence concerning the Verde River.

For example, reporting to the Secretary of the Interior on irrigation at the Camp McDowell Reservation in 1905, Indian Service Inspector W.H. Code commented on the impact of flooding on the channel of the Verde River:

> The narrow valley of the Verde River embraced within the boundaries of this reservation has a steep gradient toward the river, and the Jones Canal [which served the reservation] winding its way around the base of foot hills for a distance of nearly six miles, interceps [sic] many drainage lines, which, in times of heavy stormes [sic], run vast quantities of water which sweep out canal banks and fill sections of the ditch with a heavy sand deposit. To further increase the difficulties, the banks of the Verde River at the head of ditch have suffered great erosion . . . and the river channel seems to have scoured down to a considerable depth, leaving the present canal grade elevated a distance of several feet above the grade of river.[99]

Further commentary on the vacillating nature of the Verde River's channel is contained in a May 20, 1905, letter from J.R. Meskimons, Superintendent of Irrigation for the Office of Indian Affairs, to Indian Office Commissioner Francis E. Leupp. Meskimons was writing in regard to an irrigation survey that was in progress at the Camp McDowell Reservation. He wrote that:

> [t]he map shows the position of the river at the time the survey was made. It has, however, changed its course since, to the great detriment of the head and upper portions of the (Jones) canal. . . . When this survey was made the river had cut within about fifty feet of the canal in one place only, and that at an angle in the canal. I therefore cut a new canal about 700 feet long, thus straightening the old and removing the canal approximately 100 feet from the river. However the grade stakes were hardly set when the river again rose and cut away its bank until it approached to within ten feet of the canal in one place, and in no place for a distance of about 3000 feet is the river more than 50 feet from the canal.

When the water again subsided the Indians cleaned the upper portion of the canal again and cutting to a very flat grade got water in the canal without the aid of a weir. . . . It can be

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[99] W.H. Code to Secretary of the Interior, March 11, 1905, file "Gila River 1905," District 4, Box 82, Entry 653, Record Group 75, Records of the U.S. Bureau of Indian Affairs, U.S. National Archives, Washington D.C.

readily seen that the canal is in a precarious condition, that one good heavy rain would destroy probably a mile of the upper end of same, beside washing out and filling up of the canal wherever the flood waters from the hills strike it.[100]

The type of flooding described in the preceding two letters was hardly unusual according to other Indian Service documents. On September 22, 1905, William H. Gill, farmer in charge of the McDowell Reservation, submitted a summary for inclusion in a report by the Department of the Interior. He wrote that the Indians'

> system of irrigation is attended with great expense of time and labor. The Verde River, from which the water is diverted, is a mountain stream which becomes a raging flood with every freshet, washing away the embankment at every arroyo, and filling the [Indians'] ditch with sand. This is apt to occur both in the rainy season in summer and also during the winter.[101]

On February 10, 1909, C.R. Olberg, Superintendent of Irrigation, again noted the changing nature of the Verde's channel at Camp McDowell in a letter to W.H. Code:

> [A] flood fifteen feet in depth . . . came down the Verde River a short time ago. This flood also ruined large bodies of tillable land; so that now the channel of the Verde River is approximately a mile in width. A cross-section of the valley there would show three benches: the upper end, on which lies the irrigable land; the second a large flat consisting of gravel and sand bars, in which are imbedded numerous trees and other debris; and the lower one, in which is the present bed of the river. . . . [To irrigate Indian lands, it would be necessary to] place a brush and rock dam across the Verde, about 150 feet in length, raising the elevation of the water three feet. . . . Any general scheme of reclamation for the McDowell Indians should also provide for the control of the Verde River. The bed of this river – as already intimated – is rapidly approaching the condition that now obtains on the Gila. The Verde River flows through a flat of sand and gravel bars, from one-half to three-quarters of a mile in width, bordered by cut banks from five to twenty feet in height. It swings from one side of the flat to the other, and where it impinges against a cut bank, is continuously eroding away the land.[102]

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[100] J.R. Meskimons to Francis E. Leupp, May 20, 1905, Salt River Project Archives, Phoenix, Arizona.

[101] William H. Gill, "Report of Farmer in Charge of Camp M'Dowell Reservation," Sept. 22, 1905, Salt River Project Archives, Phoenix, Arizona.

[102] C.R. Olberg to W.H. Code, Feb. 10, 1909, file "Camp McDowell 1909," District 4, Box 73, Entry 653, Record Group 75, Records of the U.S. Bureau of Indian Affairs, U.S. National Archives, Washington D.C.

Yet another Indian Service official commented in 1910 on the Verde River's erratic behavior and frequent channel changes at Camp McDowell:

> The water proposition here under existing conditions is a very unsafe one. There is a sufficient amount in the Verde River to supply all the needs of the Indians located here but the uncertainty as to where the main channel will be from time to time makes the question of irrigation an uncertain one. Here the river is nearly, if not quite, a half mile wide from bank to bank. Today the main channel may be on one side and tomorrow one of the many floods of water many sweep down and change the entire course of the channel to the opposite side of the river, and pile up a sandbar between it and the head of the ditch; or, on the other hand, the swift current is liable to cut into the bank and ruin the intake for the canal by cutting out a deep channel many feet below the head of the canal, leaving it high and dry. . . . [The] present canal is constructed for some distance through a sandbar and then for some distance follows near the bank of the river. Just at the present time, this canal is affording a good supply of water but the element of uncertainty as to its permanency, reduced the assurance of raising a crop almost to the minimum. The first floods coming down may render it absolutely useless.[103]

D. SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT REPORTS AND OTHER DOCUMENTS

The records of the federal agencies whose responsibilities were most closely associated with water resource development in the West (the Reclamation Service and the Geological Survey) as well as the records of the U.S. Indian Service consistently portrayed the Verde River as highly erratic with unpredictable flows and a shifting channel. Such a stream could hardly provide a reliable means of transportation.

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[103] Report of Inspector Joe H. Norris, Camp McDowell, Arizona, April 9, 1910, Salt River Project Archives, Phoenix, Arizona, pp. 5-6.

VI. MISCELLANEOUS DOCUMENTS AND PHOTOGRAPHS

The following miscellaneous documents and photographs, gathered from many sources, reinforce the evidence found in federal surveys, federal and state patents, and other government documents indicating the lack of navigability of the Verde River.

A. MISCELLANEOUS HISTORICAL DOCUMENTS

Included in this discussion are textual records such as legislative pronouncements, the observations of irrigation enthusiasts, statements by local residents, commentary by an observer seeking to establish a national forest in lands through which the Verde flowed, and more recent historical studies. This material, which ranges chronologically from 1865 to 1986, supports the findings in other parts of this report that the Verde River was erratic, unreliable, and blocked by obstructions such as sand bars, gravel beds, boulders, and diversion dams. These documents are representative of many more illustrating the same conclusions regarding the Verde.

As early as 1865, members of the Arizona Territorial Legislature, meeting in its second session, had reached the conclusion that the Verde River was not navigable. The legislators passed on December 28, 1865, a "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River." Seeking $150,000 to remove obstacles such as sand bars, snags, boulders, and other obstructions in the Colorado's bed, the memorial declared that "the Colorado River is the only navigable water in this Territory[.]" (Emphasis added.) It also noted that if the improvements were carried out, the Colorado would be navigable as far as Callville,[104] where a wagon road would connect with Salt Lake City.[105]

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[104] Callville was a Mormon community on what is now the Nevada side of Lake Mead upstream from Hoover Dam.

[105] "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River,"

Confirming the Arizona Territorial Legislature's conclusion that only the Colorado was navigable, an article published in 1892 noted that the Verde River was a "stream of considerable size and the largest tributary of Salt River." However, the article continued that "[t]he Rio Verde, like all Western streams, is quite copious during the spring months from the periodical rains and melted snow, but during the summer and autumn it is only a creek of 500 inches." Such variations in flow would have made the Verde extremely difficult to use for regular navigation.[106]

Given the Verde's substantial flows during the spring, it is not surprising that interest emerged in damming the river to conserve its waters for irrigation. For instance, on January 17, 1898, the Rio Verde Canal Company recorded a claim with the Maricopa County Recorder for 5,000 cubic feet of Verde River water per second. In the claim notice, the water company stated its intention to "build and maintain a diversion dam across the Verde River . . . of the height of ninety-two (92) feet above the bed of said stream." The company also intended to build other dams, including at what came to be known as the Horseshoe Reservoir site, another dam at the Lower Verde Reservoir site, and yet another named simply Storage Reservoir No. 4. Yet despite the fact that these dams would undoubtedly impede navigation, there is no evidence of any protests against the proposed dams by any navigational interests.[107]

Not only would have dams hindered navigation on the Verde, but so too would have the impact of grazing on adjacent lands. S.J. Holsinger's 1904 "Report on the Proposed Verde River Forest Reserve, Arizona" described how the channel had been ruined by over-grazing on nearby

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Acts, Resolutions, and Memorials of the Territorial Legislature of Arizona, 1865 (N.p., n.d), copy at Arizona Historical Foundation, Arizona State University, Tempe, Arizona.

[106] "The Rio Verde Company," *Phoenix Republican*, May 1892 (precise date unknown), reprinted in David M. Goodman, comp., *Arizona Odyssey* #2330 (Tempe: Arizona Historical Foundation, 1969).

[107] "Claim of the Rio Verde Canal Company" (with quotation at page 1), Jan. 17, 1898, Salt River Project Archives, Phoenix, Arizona.

lands. Focusing first on the quality of land, trees, and streams in an area encompassing the Verde River that was proposed to be set aside as a forest reserve, Holsinger wrote toward the end of his report:

> [t]he Verde River thirty years ago had a well defined channel. Today it is so badly silted that irrigation is rendered expensive and difficult. To an unprejudiced mind the cause is easily discovered. Goats, sheep and cattle have closely browsed the brush.[108]

Early Phoenix resident Carl Hayden also indicated that the Verde was not navigable. In his speech in front of the U.S. House of Representatives on February 3, 1916, the subject was flood control on non-navigable streams. House Resolution 122 had been introduced by the Speaker of the House, and Hayden interpreted the Speaker's intention to be the creation of "a committee having jurisdiction over all bills relating to flood control whether the floods occur on navigable or non-navigable streams." Hayden explained his support of this resolution: "I come from a State where we have dry rivers and no harbors, and I want to see a committee established that will give consideration to the flood problems on nonnavigable streams." In commenting on the constitutionality of federal funding for flood control on non-navigable streams, Hayden argued that such an expenditure not only had local advantages, but also was in the national interest. He claimed that railroads were often affected by floods, which hurt interstate commerce, and that the U.S. Postal Service was also consistently interrupted by flooding. He also argued that the care of national defense would be assisted by funding for flood control, asserting that "troops can not be readily moved or supplied when the rivers are in flood. Hayden's remarks in this speech made it clear that in his view all Arizona streams were non-

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[108] S.J. Holsinger, "Report on the Proposed Verde River Forest Reserve, Not Comprising Portions of the Prescott, Tonto, and Crook National Forests," p. 15, March 19, 1904, Salt River Project Archives, Phoenix, Arizona.

navigable, including the Verde River. What Hayden sought, therefore, was money to curb flooding on the state's unpredictable streams, including the non-navigable Verde.[109]

B. UNPUBLISHED HISTORICAL REPORTS

At about the same time Hayden was commenting on flooding in Arizona, proposals for the Paradise-Verde Project were shedding further light on the nature of the Verde River. The idea for tapping the Verde for water supplies independent from those to be used for the Salt River Project had been discussed for many years by the time of Hayden's comments, and by the early 1920s they had gained new support among residents of the Paradise Valley.

1. Beckman & Linden's 1920 Report

With that backing in mind, in 1920, Beckman & Linden Engineering Corporation of San Francisco issued its "Report on the Irrigation Project, Paradise-Verde Irrigation District, Phoenix, Arizona."[110] The study was a synopsis of the possibility of constructing the Paradise-Verde Irrigation District.

The District was proposed to encompass what was known as the Paradise and Deer valleys, which were located north of Phoenix between the Phoenix Mountains on the southwest and the McDowell Mountains on the northeast (see map below).

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[109] Carl Hayden, "Speech of Hon. Carl Hayden, of Arizona, in the House of Representatives, Thursday, February 3, 1916," folder 11, box 653, Carl Hayden Papers, Mss. 001, Arizona State University, Tempe, Arizona.

[110] Beckman & Linden Engineering Corporation, "Report on the Irrigation Project, Paradise-Verde Irrigation District, Phoenix, Arizona," Accession 8NN-115-85-006, Entry 7, General Administrative and Project Records, 1919-1945, Project Files, 1919-1929, Verde 023.6-301, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archive branch, Rocky Mountain Region, Denver, Colorado.

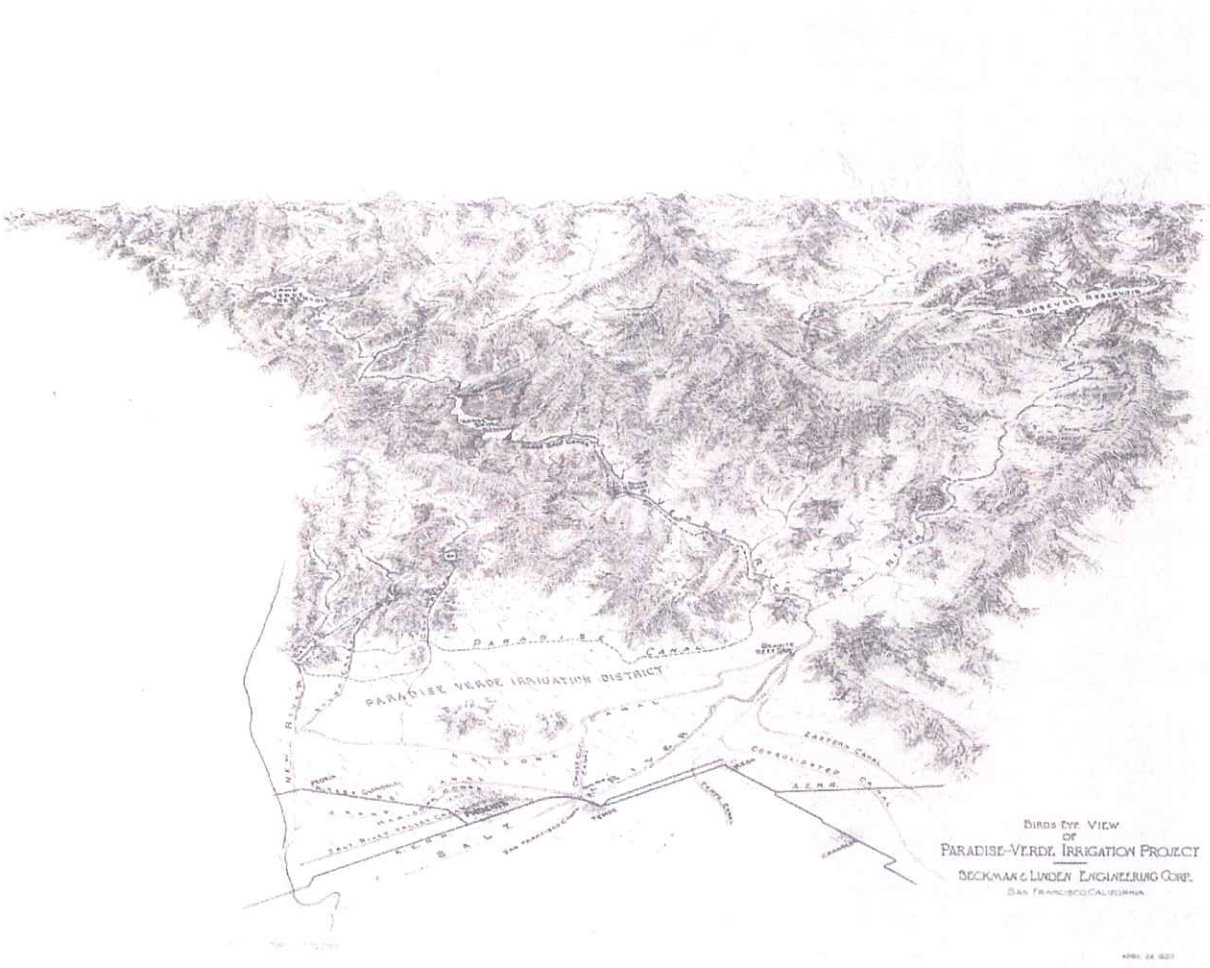

Figure 50. Map of "Birds-Eye View of Paradise-Verde Irrigation Project," April 24,1920, Beckman & Linden Engineering Corporation, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

On the southeast, the District was to join the Arizona Canal of the Salt River Project and on the south the District would be bounded by the Gila Indian Reservation. The District was to be about 25 miles long and 10 miles wide and had an area of 250 square miles. Backers of the Paradise-Verde Project proposed building two major reservoirs on the Verde River (Camp Verde Dam and Horseshoe Dam), several lesser storage facilities on smaller tributaries of the Salt River

(New River Dam and Skunk Creek Dam), and various diversion dams, canals, laterals, pumping plats, and other works.[111]

The origins of the Paradise-Verde Project lay in the initial outcome of the construction of Roosevelt Dam for the Salt River Project. By 1914, with Roosevelt apparently providing enough water for the entire Salt River Project, the Paradise-Verde Irrigation District applied for the right to store and divert all waters of the Verde River not then being utilized for the Salt River Project. By 1919, at least two detailed studies of the Paradise-Verde Project had been completed by the Reclamation Service and others, the conclusions of which differed on whether the Project was viable by itself or whether the Verde's waters were needed by the Salt River Project. Significantly, neither study cited any objections by navigation interests along the Verde to diverting that stream's supplies for irrigation either as part of the Salt River Project or for the Paradise-Verde Project. In fact, a report issued in 1920 by Beckman & Linden Engineering specifically cited the rights of farmers under the proposed Paradise-Verde Project to sufficient water supplies as a reason for going forward with the venture – Beckman & Linden cited no concerns by navigation:

> It would be an unpardonable act to deprive all these people [in the Paradise Valley] forever of the rights to the necessary water for their lands. No economic consideration with regard to applying these waters of the Verde River in another locality could compensate for the losses involved both in a material and moral sense resulting in the abandonment of the district. Such forced abandonment of the district would mean a complete loss of all things done by the settlers up to date.[112]

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[111] Beckman & Linden Engineering Corporation, "Report on the Irrigation Project, Paradise-Verde Irrigation District, Phoenix, Arizona," pp. 3, 12, Accession 8NN-115-85-006, Entry 7, General Administrative and Project Records, 1919-1945, Project Files, 1919-1929, Verde 023.6-301, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archive branch, Rocky Mountain Region, Denver, Colorado.

[112] Beckman & Linden Engineering Corporation, "Report on the Irrigation Project, Paradise-Verde Irrigation District, Phoenix, Arizona," p. 13, Accession 8NN-115-85-006, Entry 7, General Administrative and Project Records, 1919-1945, Project Files, 1919-1929, Verde 023.6-301, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archive branch, Rocky Mountain Region, Denver, Colorado.

With regard to the Camp Verde and Horseshoe dams, the Beckman & Linden Engineering study reported that the first structure would have a capacity of 421,000 acre-feet while the latter would store 233,000 acre-feet. The report did not discuss any adverse affects these reservoirs might have on the navigability of the Verde. The Beckman & Linden report also contained a detailed analysis of water rights for the Paradise-Verde Project, but nothing in that account indicated that the venture might interfere with navigation on the Verde. In fact, that review noted that the only possible objections to the Project might come from the Salt River Project and from claims by Indian tribes.[113]

The report also contained two photos of the proposed Horseshoe Dam site showing a relatively shallow riverbed covered with rocks and/or sand with apparently shallow water. A third photo illustrated the location of what was proposed to be Power House No. 1 on the Verde River. This locale also showed a very shallow and nearly dry river. None of the photos suggested the possibility that the Verde River might be navigable (see below for reproductions of the photos).

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[113] Beckman & Linden Engineering Corporation, "Report on the Irrigation Project, Paradise-Verde Irrigation District, Phoenix, Arizona," pp. 27-28, 35-36, Accession 8NN-115-85-006, Entry 7, General Administrative and Project Records, 1919-1945, Project Files, 1919-1929, Verde 023.6-301, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archive branch, Rocky Mountain Region, Denver, Colorado.

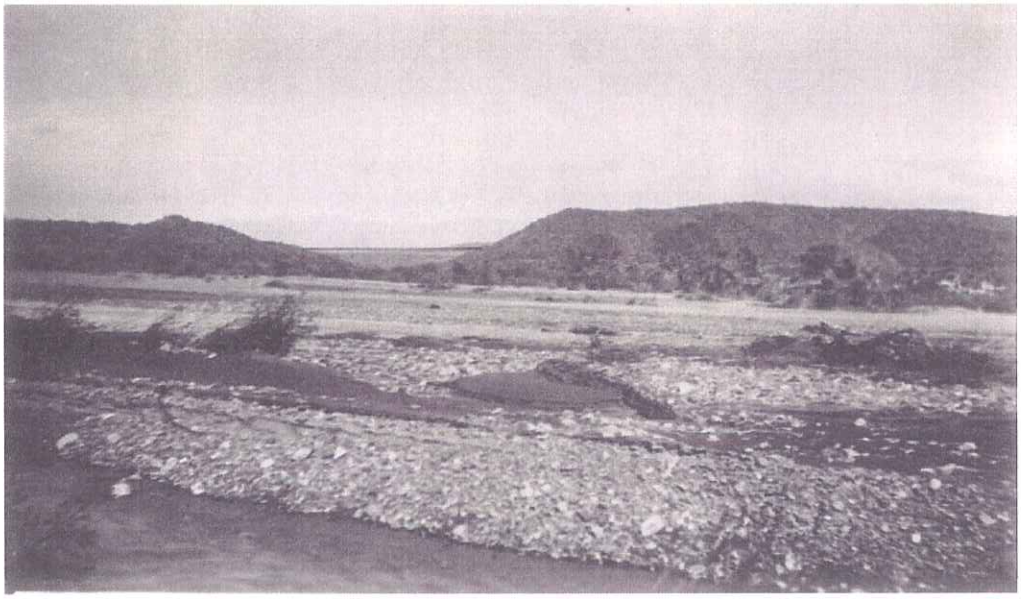

Figure 51. Photograph of "Horseshoe Damsite," [1920], Beckman & Linden Engineering Corporation, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

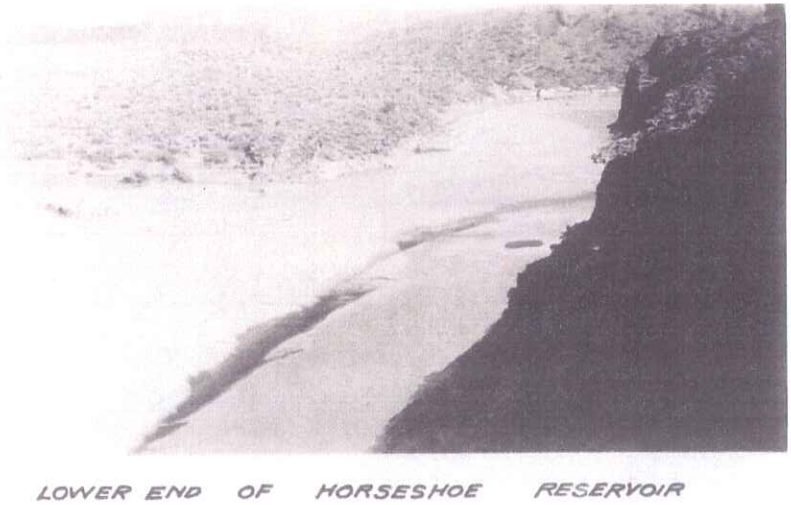

Figure 52. Photograph of "Lower End of Horseshoe Reservoir," [1920], Beckman & Linden Engineering Corporation, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

Figure 53. Photograph of "Power House Site No. 1 and Verde River," [1920], Beckman & Linden Engineering Corporation, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

2. The Reclamation Service's 1920 "Harris" Report

Because of the continuing interest in the Paradise-Verde idea, the Reclamation Service also commissioned its own study by a consulting engineer of the feasibility of the venture. Released in May 1920, A.L. Harris's "Report on the Paradise-Verde Irrigation Project, Near Phoenix, Arizona," also concluded that the undertaking was possible. Like Beckman & Linden's study, Harris did not find any conflicts with navigation on the Verde River, although he opined that "I see no point wherein it [the Paradise-Verde Project] conflicts with the public good."[114] Harris's study also included photographs of the Verde River that further demonstrated the stream's lack of navigability. For instance, the three photographs taken in 1920 of "Camp Verde Dam-Sites" numbered 1, 2, and 4 (number 3 was simply a close-up of number 2) all demonstrate

[114] A.L. Harris, "Report on the Paradise-Verde Irrigation Project, Near Phoenix, Arizona," May 1920, p. 46, Accession 8NN-115-85-006, Entry 7, General Administrative and Project Records, 1919-1945, Project Files, 1919-1929, Verde 023.6-301, Records of the Bureau of Reclamation, Record Group 115, U.S. National Archives branch, Rocky Mountain Region, Denver, Colorado.

a rugged riverbed. Numerous rocks, sand beds, and canyon walls would have made navigation of this stretch of the Verde River impossible. (See below.)

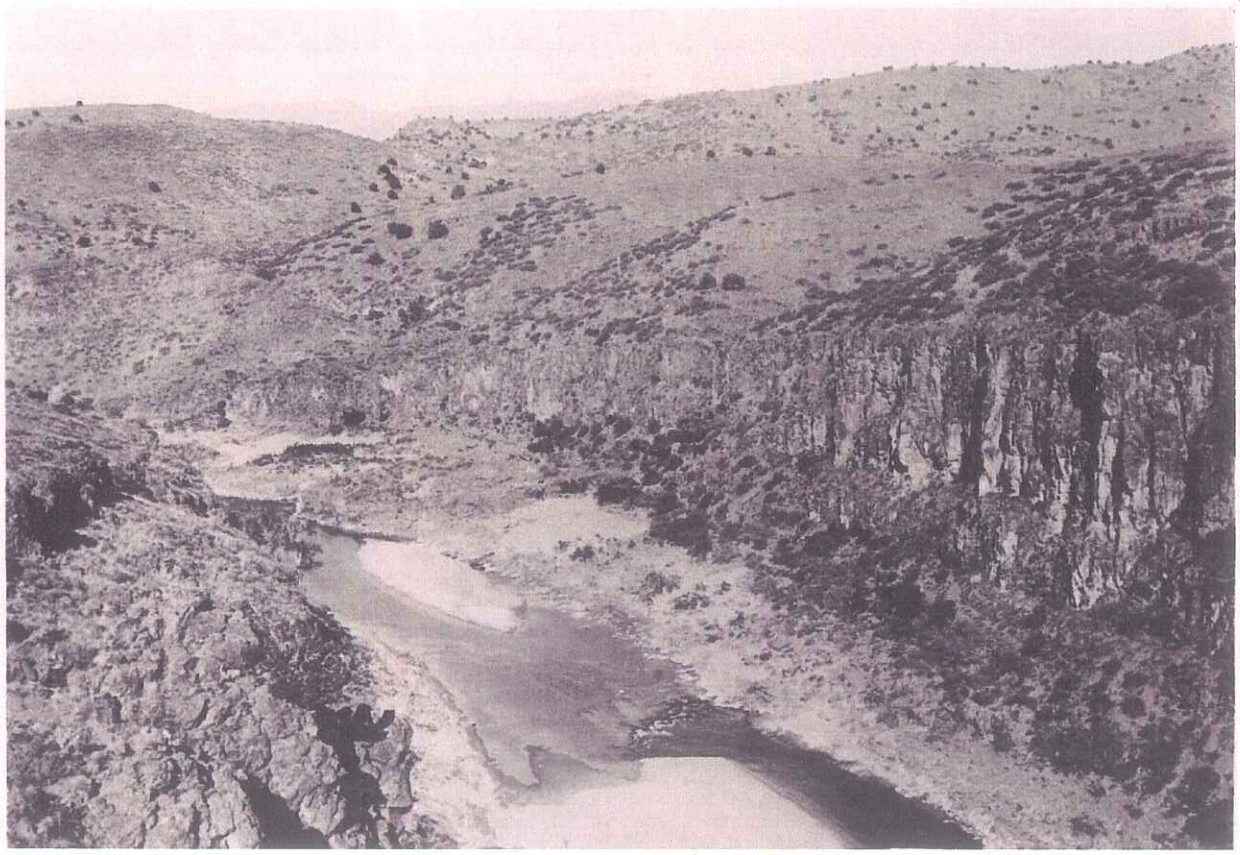

Figure 54. Photograph of "Camp Verde Dam – Site No. 1," in A.L. Harris, "Report on Paradise-Verde Irrigation Project Near Phoenix, Arizona," May 1920, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

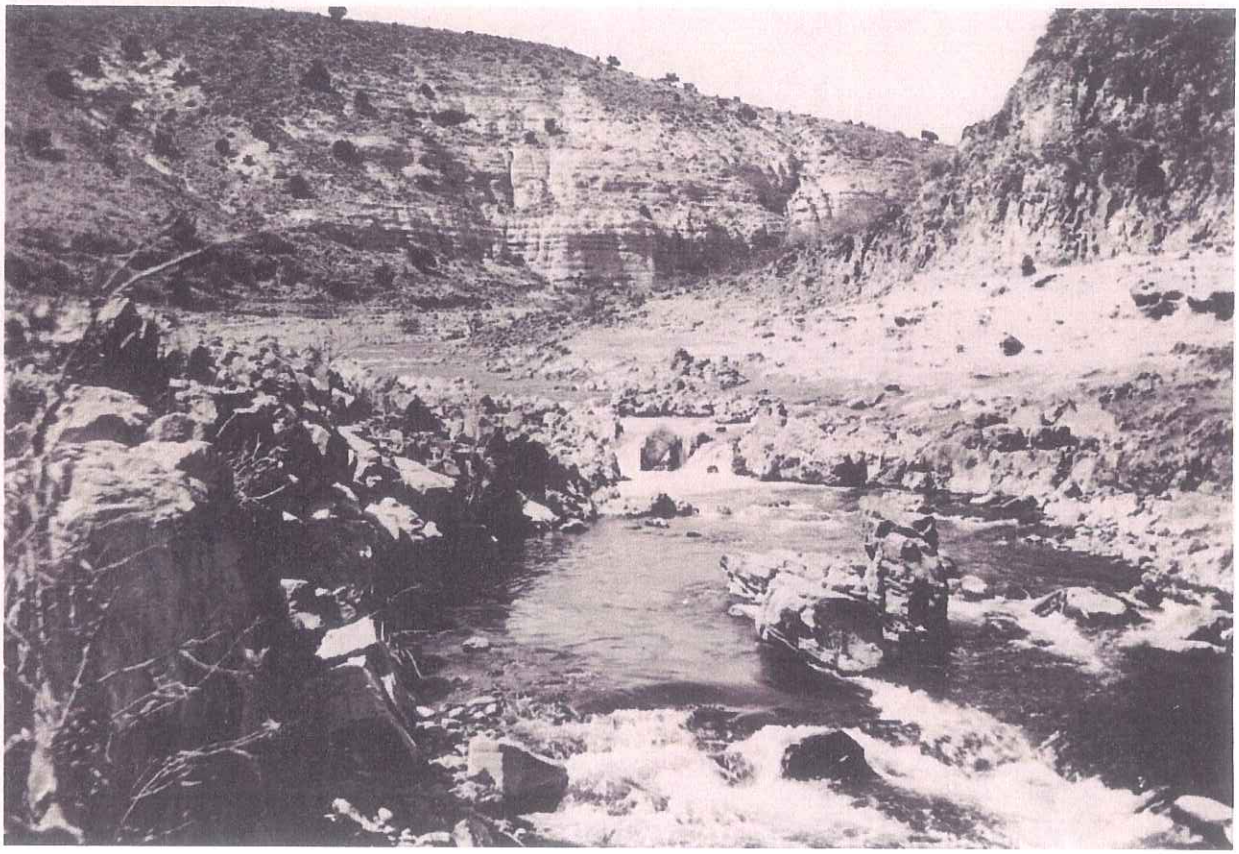

Figure 55. Photograph of "Camp Verde Dam – Site No. 2," in A.L. Harris, "Report on Paradise-Verde Irrigation Project Near Phoenix, Arizona," May 1920, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

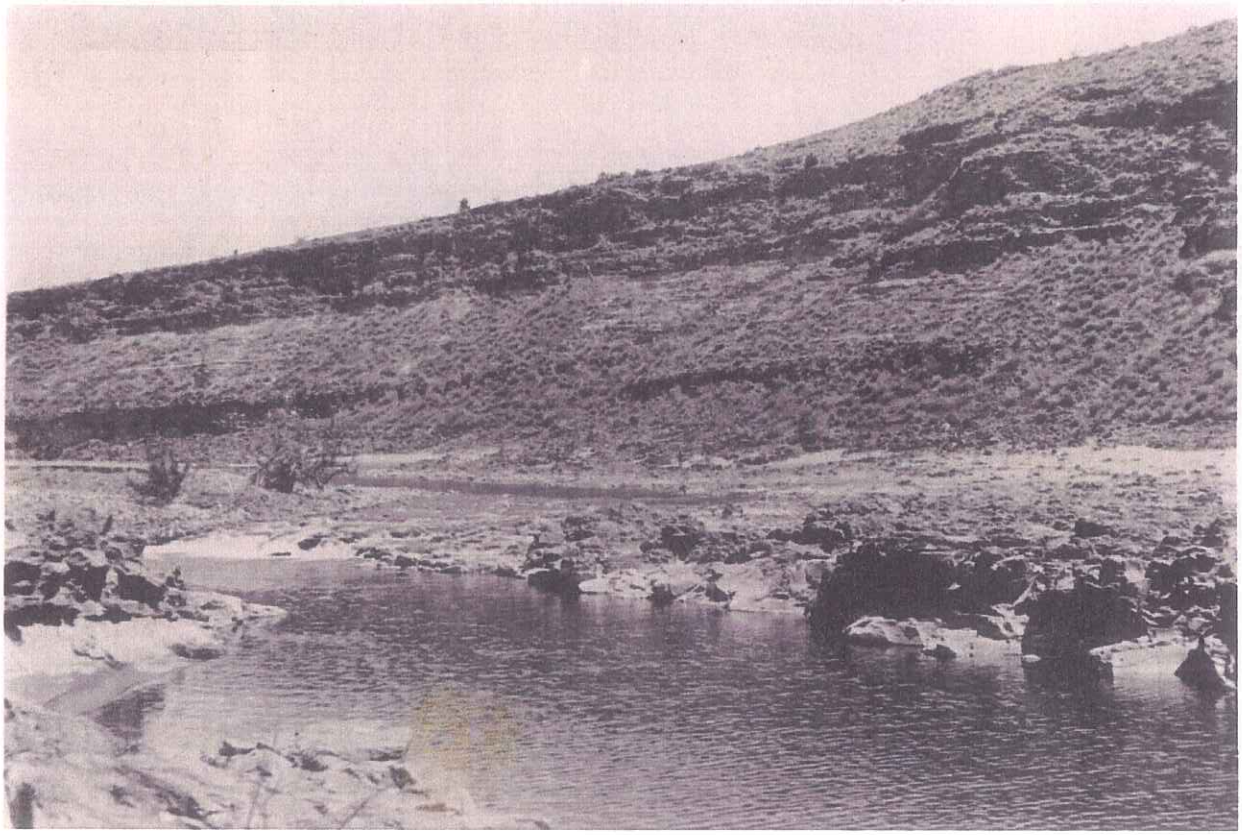

Figure 56. Photograph of "Camp Verde Dam – Site No. 4," in A.L. Harris, "Report on Paradise-Verde Irrigation Project Near Phoenix, Arizona," May 1920, contained in Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

Ultimately, by the 1930s the Bureau of Reclamation had elected to include the Verde River's water supplies in those destined for use by the Salt River Project. With this decision, the Bureau conducted further studies of the Verde River, which resulted in additional photographs of dam sites along the stream, including the locale where Bartlett Dam was constructed in the 1930s. These photos, some of which are reproduced below, further demonstrate the lack of navigability of the Verde River.

The first three photos are sections of a panoramic view, looking from upstream to downstream, of the Verde River at dam site No. 1 on May 31, 1934. The fourth photo is a long-distance view of the potential dam sites shown in the panorama photos. Following that photo are

four pictures of the Bartlett Dam site in 1936 followed by one of the completed dam, which was finished in 1939.

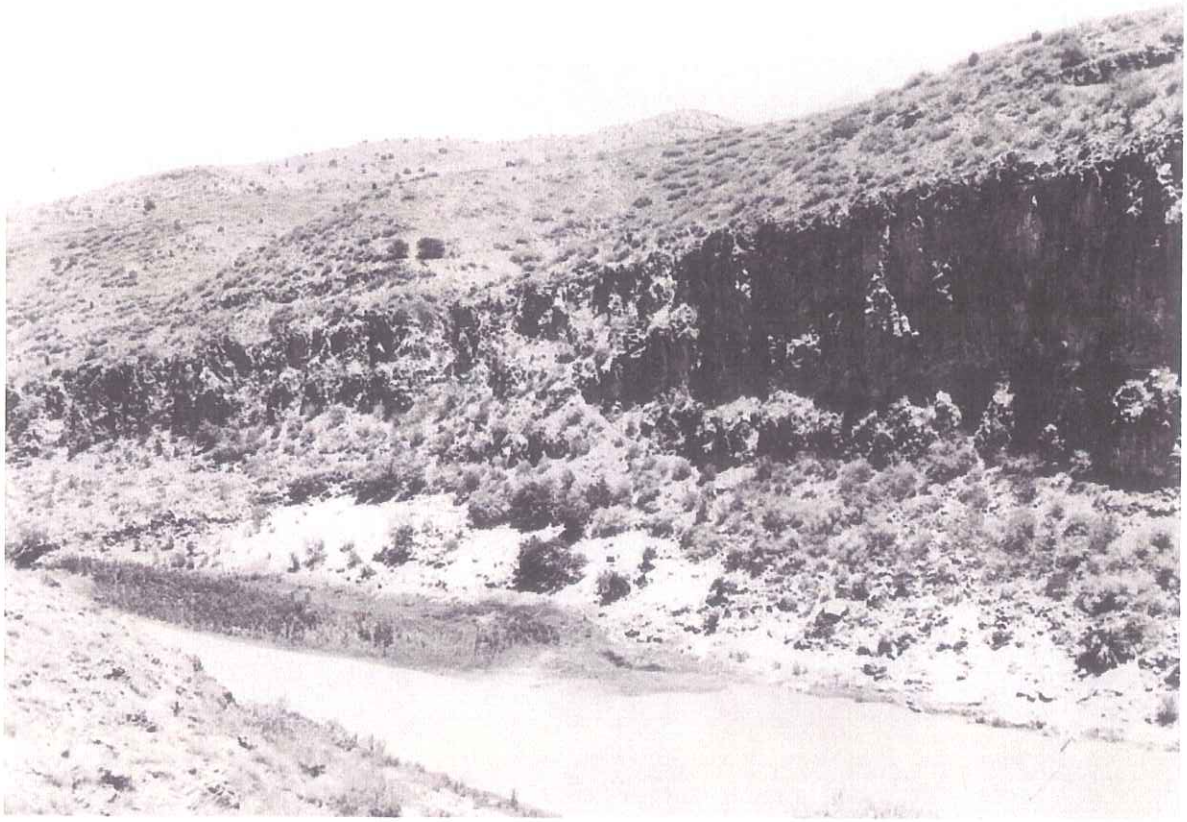

Figure 57. Photograph of "East Wall of Canyon on the Left Side of Verde river in the Vicinity of Damsite No. 1," May 31, 1934 (part 1 of a panorama), Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

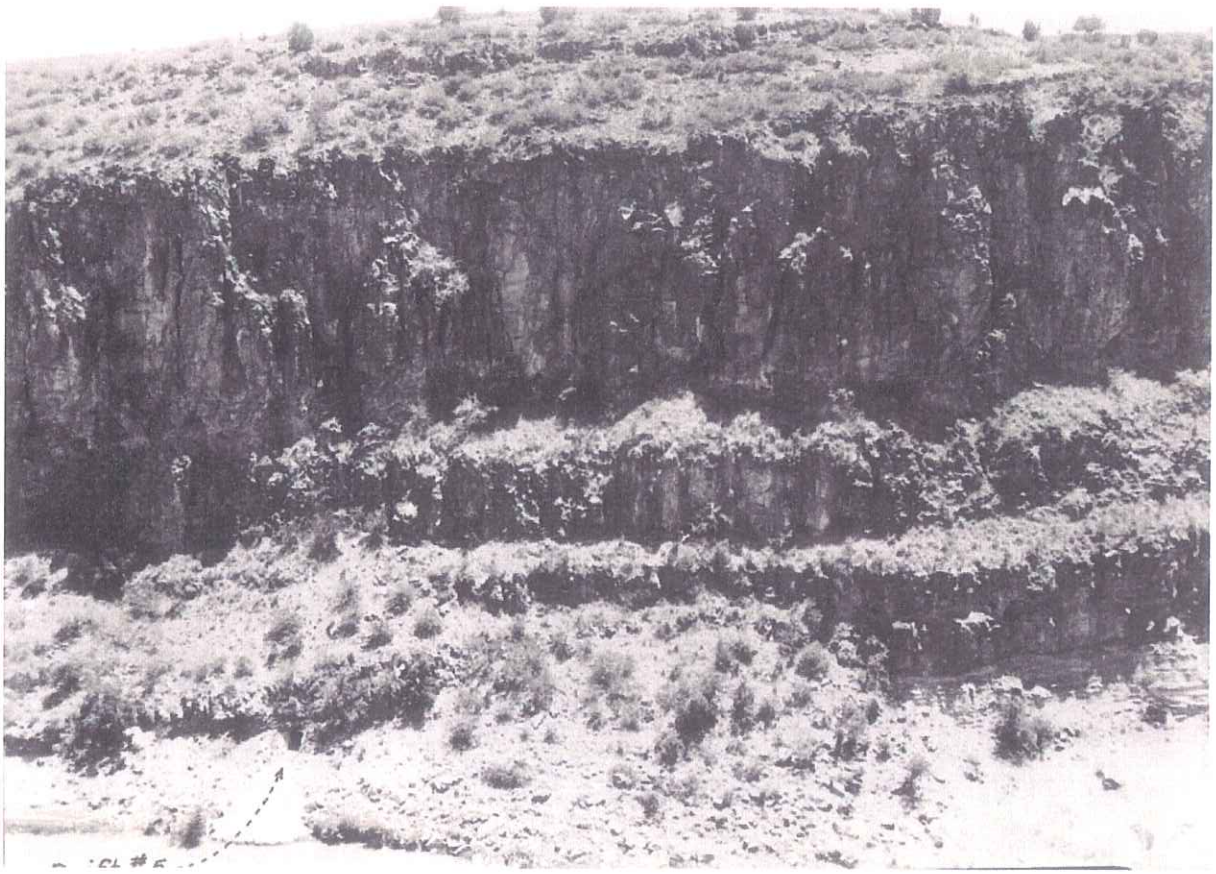

Figure 58. Photograph of "East Wall of Canyon on the Left Side of Verde river in the Vicinity of Damsite No. 1," May 31, 1934 (part 2 of a panorama), Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

Figure 59. Photograph of "East Wall of Canyon on the Left Side of Verde river in the Vicinity of Damsite No. 1," May 31, 1934 (part 3 of a panorama), Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

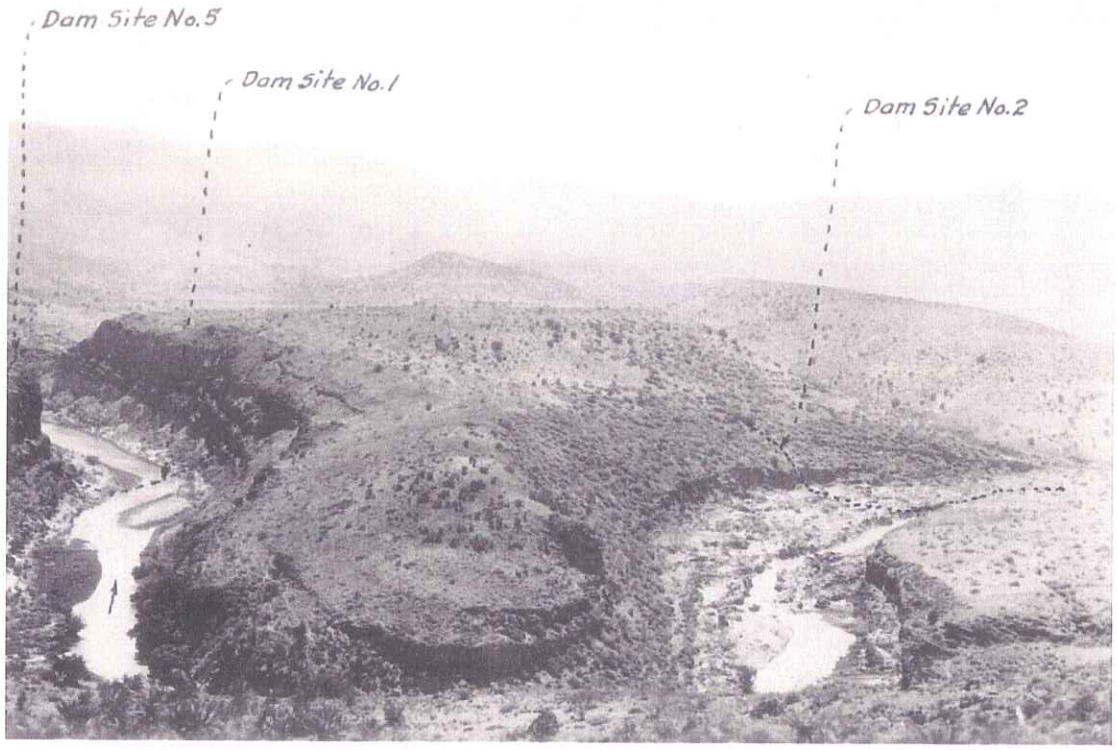

Figure 60. Photograph of "View of Damsites Nos. 1 and 2, Upper Portion of No. 5, Sycamore Creek Spillway and New Road on East Side of Verde River," May 31, 1934 (part 2 of a two-part panorama – part 1 is not reproduced in this report), Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

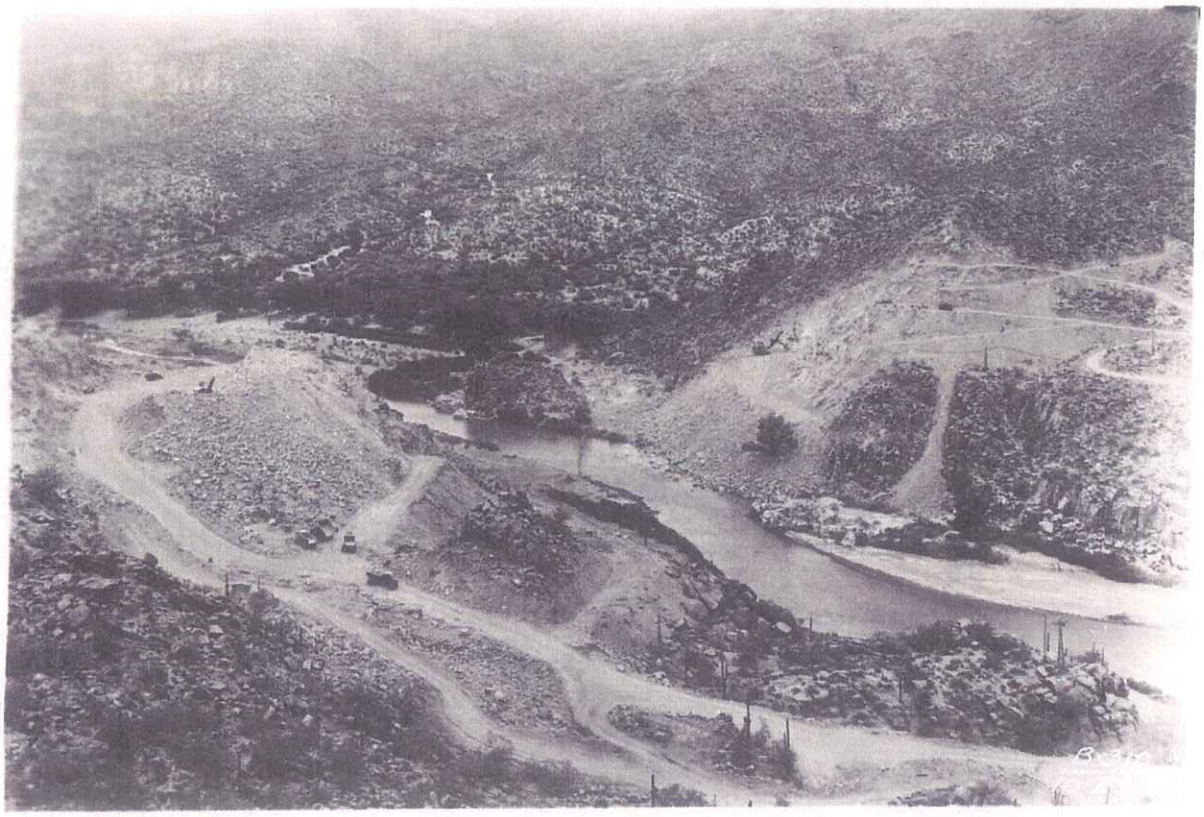

Figure 61. Photograph of "Bartlett Dam Site Looking Upstream on the Verde," 1936, Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

Figure 62. Photograph of "Bartlett Dam Site Looking Downstream on the Verde," 1936, Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

Figure 63. Photograph of "Bartlett Dam Site Looking Downstream on the Verde," 1936, Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

Figure 64. Photograph of "Bartlett Dam Site Looking Downstream on the Verde," 1936, Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

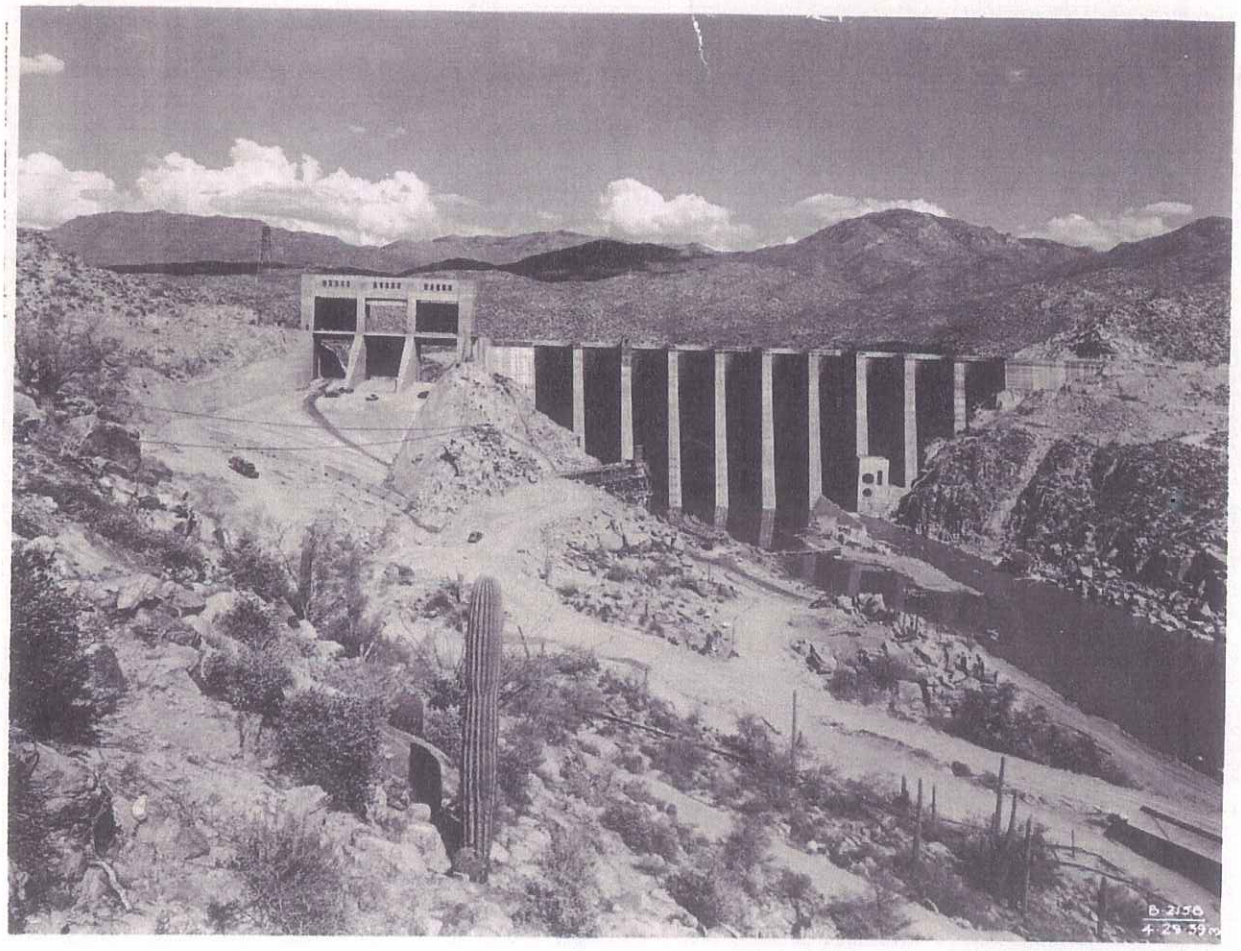

Figure 65. Photograph of "Bartlett Dam Nearing Completion on the Verde," 1939, Records of the U.S. Bureau of Reclamation, National Archives branch, Rocky Mountain Region, Denver, Colorado

C. MORE RECENT HISTORICAL STUDIES

Karen Smith, a recent historian of the central Arizona area, noted that no river in that part of the State provided water transportation. In her doctoral dissertation, which was later published as *The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917* (1986), Smith described the Phoenix area:

> On the face of it, the growth of metropolitan Phoenix from a dusty village located near the Salt River to the ninth-largest city in the United States has been something of an anomaly. There was no major railroad connection to Phoenix

until the 1920s, *no harbor or navigable river* to spawn commerce, and no major trail or crossroads to lure tired travelers to stop. [Emphasis added.][115]

D. MISCELLANEOUS HISTORICAL PHOTOGRAPHS

In addition to the voluminous textual evidence with related photos retrieved in research, numerous other historical photographs were also obtained. These provide visual documentation leading to the same conclusions reached in the unpublished and published document collections. Included in this report is a selection of photos illustrating various levels of the Verde River's flow. Some show the river to be extremely shallow, while others demonstrate the devastation of the regularly occurring floods. The photographs, spanning over thirty years from the 1880s to 1920 and originating in different archives, provide visible evidence of the erratic and unreliable nature of the Verde River.

Upriver, in the Camp Verde Valley area, the river was perhaps not so rugged, but non-navigable nonetheless. Two photos from the Fort Verde State Historical Park showing the Indian ruins near the confluence of Verde River and Oak Creek clearly demonstrate the winding, narrow course of the Verde, hazardous at best for any type of boat (see below).

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[115] Karen L. Smith, *The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917* (Tucson: University of Arizona Press, 1986), p. ix.

Figure 66. Photograph of "Prehistoric Ruins at the Confluence of the Verde River and Oak Creek," 1880s, Fort Verde State Historical Park, Arizona

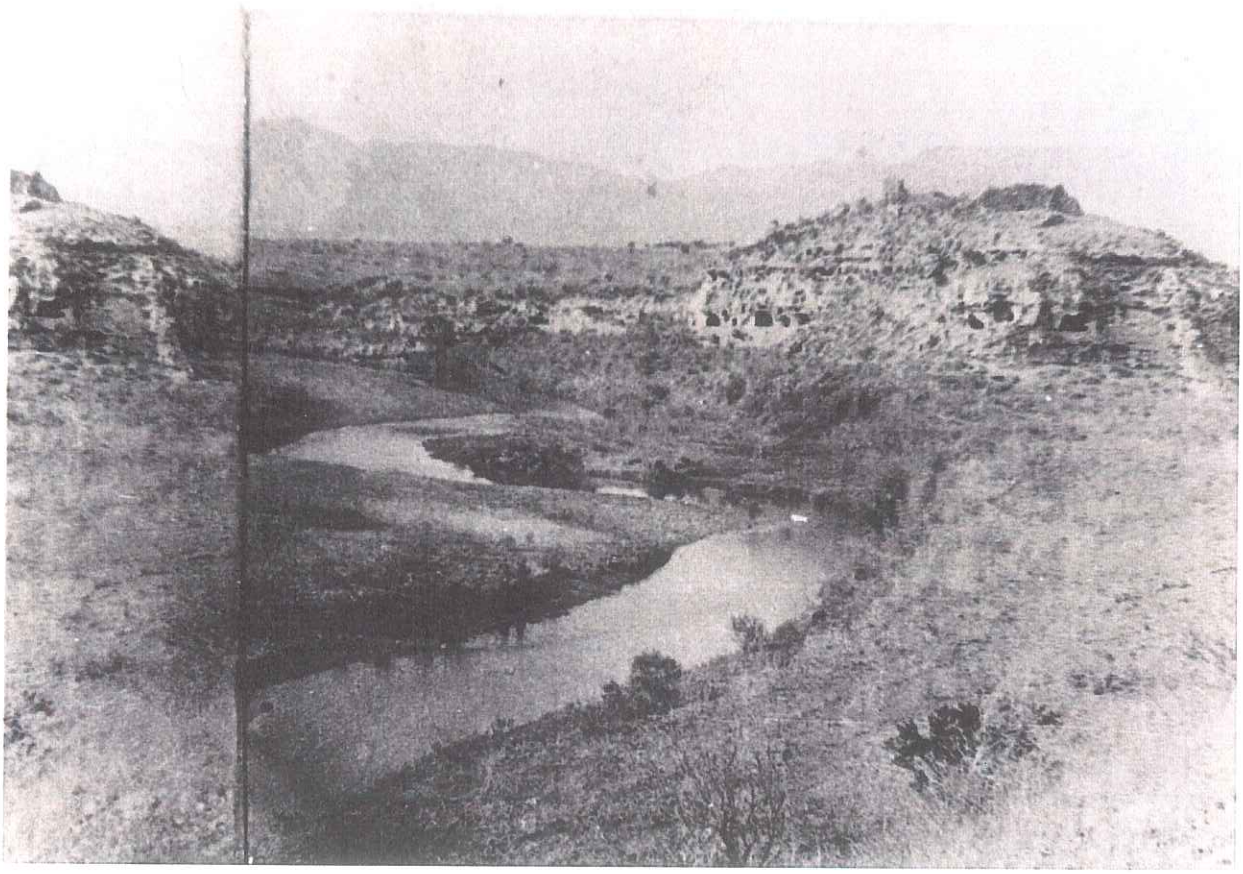

Figure 67. Photograph of "Indian Ruins Near the Confluence of the Verde River and Oak Creek," no date, Fort Verde State Historical Park, Arizona

Another, closer photo of these prehistoric ruins was taken on April 16, 1887, by Dr. Edgar A. Mearns, the Post Surgeon at Fort Verde from March 1884 to May 1888. Mearns was a prolific photographer and amateur archaeologist. His photograph of these ruins illustrate two points about the navigability of this river. First, shown in the foreground, the Verde River is clearly shallow bed and riddled with sand and gravel beds. Second, the photo shows horses and a wagon which presumably had to ford the river to get to their position in this picture. The ability to ford the river also suggests that this river was not navigable (see the following photograph).

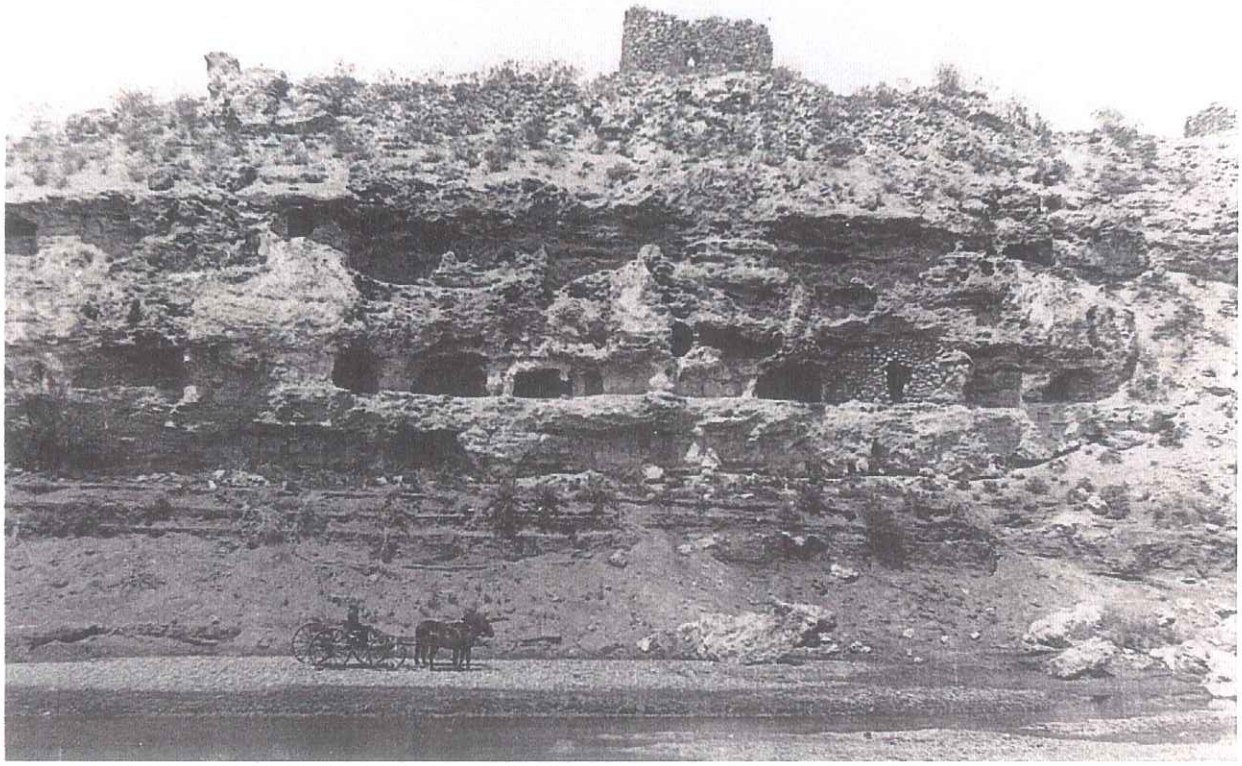

Figure 68. Edgar A. Mearns, photograph of "Ruins at the Confluence of Verde River and Oak Creek," April 1887, Fort Verde State Historical Park, Arizona

Another photo from the Fort Verde State Historical Park shows the Cottonwood Ford taken in 1886-1887. The photo shows several cows crossing at the ford, and it is apparent how shallow the river is (see the following photograph).

Figure 69. Photograph of "The Cottonwood Ford at Fort Verde, 1886-1887," Fort Verde State Historical Park, Arizona

Two more Mearns photographs further illustrate how difficult the river would have been to navigate. The first shows Fort Verde residents standing on a sand bar in the Verde River, apparently demonstrating that this was a river that was easily crossed and shallow (see below).

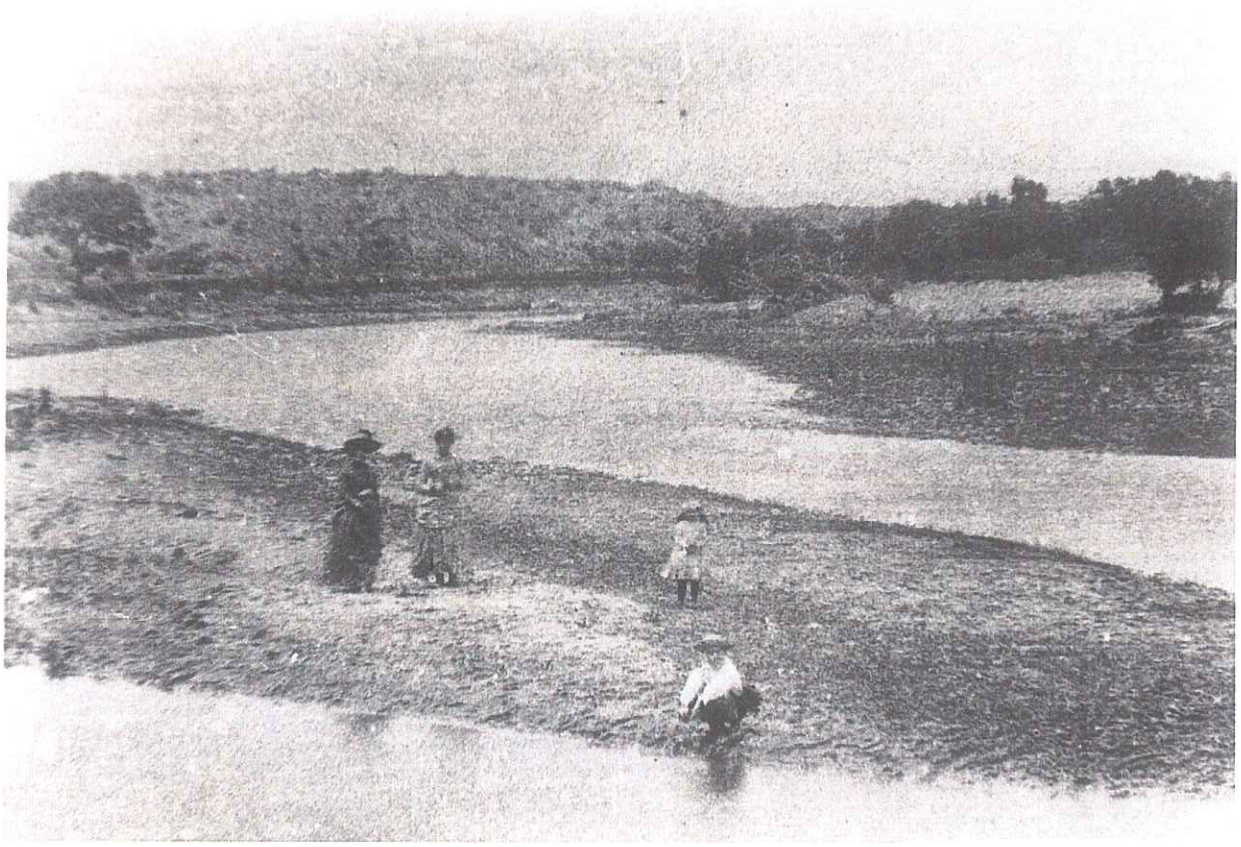

Figure 70. Edgar A. Mearns, photograph of "Residents on a Sand Bar in Verde River between 1884-1888," Fort Verde State Historical Park, Arizona

The last Mearns photo, showing two men in a boat in the foreground, could easily be misinterpreted. The caption for this photo, located at Fort Verde Historical Park, noted that "[i]t seems likely that this is the collapsable [sic] boat requested by the Post commander to aid in getting messages and couriers across the river when it was high or in flood." Importantly, this suggests that the boat was not used year round (there were fords available for crossing the river at most times), but that during flood season (usually January to March), the boat was used to get across the river. In other words, the boat was used as a way to avoid, rather than use, the Verde River (see photo below).

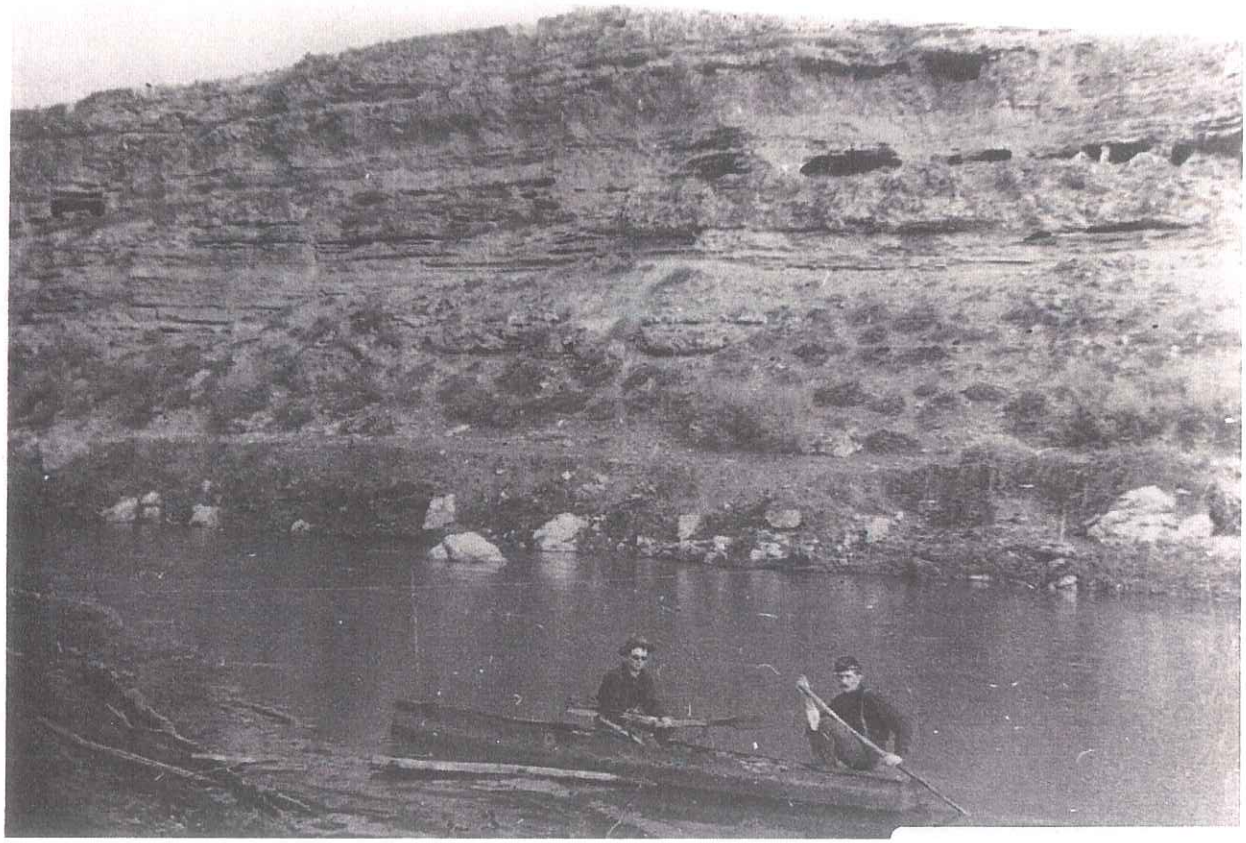

Figure 71. Edgar A. Mearns, photograph of "Soldiers from Fort Verde Using a Boat on the Verde River Just Opposite the Post, 1884-1888," Fort Verde State Historical Park, Arizona

Even further upstream, near Jerome and Clarkdale, historic photos of the river continue to demonstrate its non-navigable nature. The panoramic view of Clarkdale, Arizona (reproduced here in three segments), show that the river was sandy, broad, and shallow, marred in many places by wagon tracks. These tracks and the characteristics demonstrated by the river in these additional photos are some of the best evidence available as to the river's non-navigable nature (see the following three photographs).

Figure 72. Photograph of "Panoramic View of Clarkdale, AZ, 03-25-1914" (part 1 of 3), Arizona Historical Foundation, Tempe, Arizona

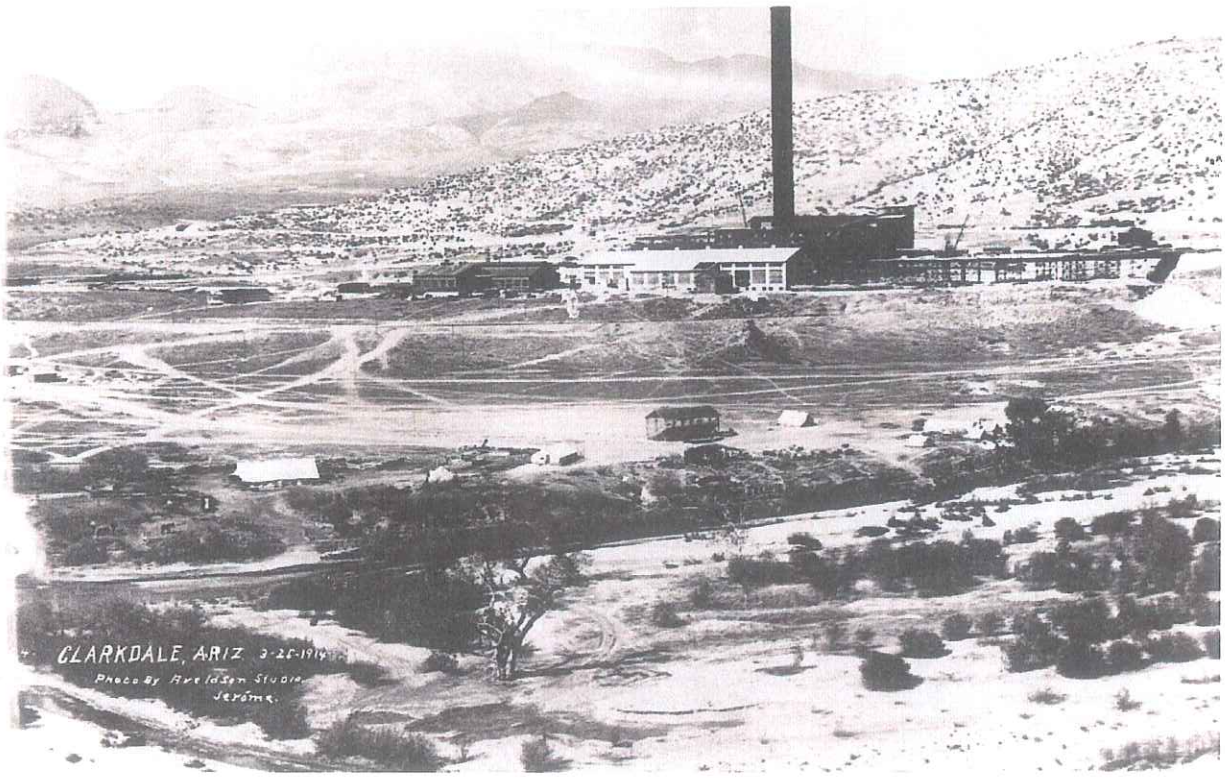

Figure 73. Photograph of "Panoramic View of Clarkdale, AZ, 03-25-1914" (part 2 of 3), Arizona Historical Foundation, Tempe, Arizona

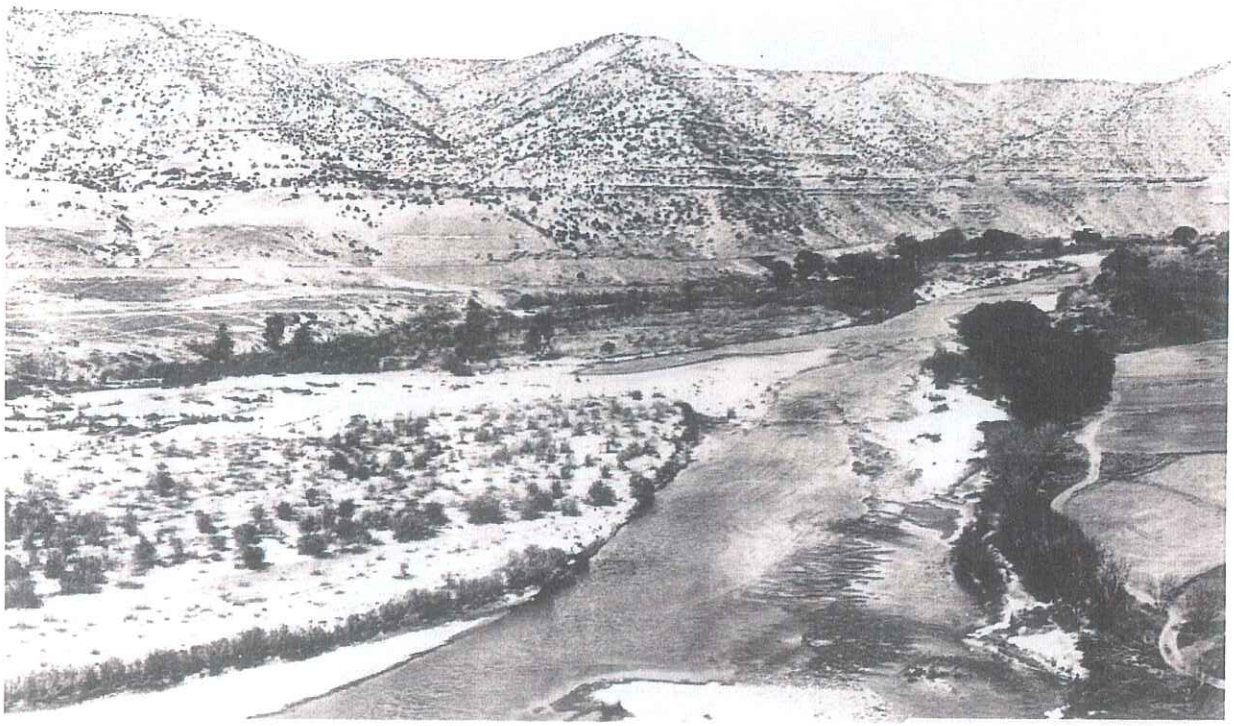

Figure 74. Photograph of "Panoramic View of Clarkdale, AZ, 03-25-1914" (part 3 of 3), Arizona Historical Foundation, Tempe, Arizona

In contrast to the photos already discussed are photos of the infamous 1916 flood on the Verde. The photographs of the flood show another side of the Verde River – its erratic and unreliable nature. Taken near Jerome, the photos demonstrate just how destructive this flood was. Despite the volume of water in the river, the Verde remained non-navigable during flood times due to the water's velocity and the debris that was present in the river during such times (see the following photographs).

Figure 75. Photograph of "United Verde Co's Smelter Low Pressure Pump House, Clarkdale, AZ, Jan. 28, 1916," Jerome Historical Society, Jerome, Arizona

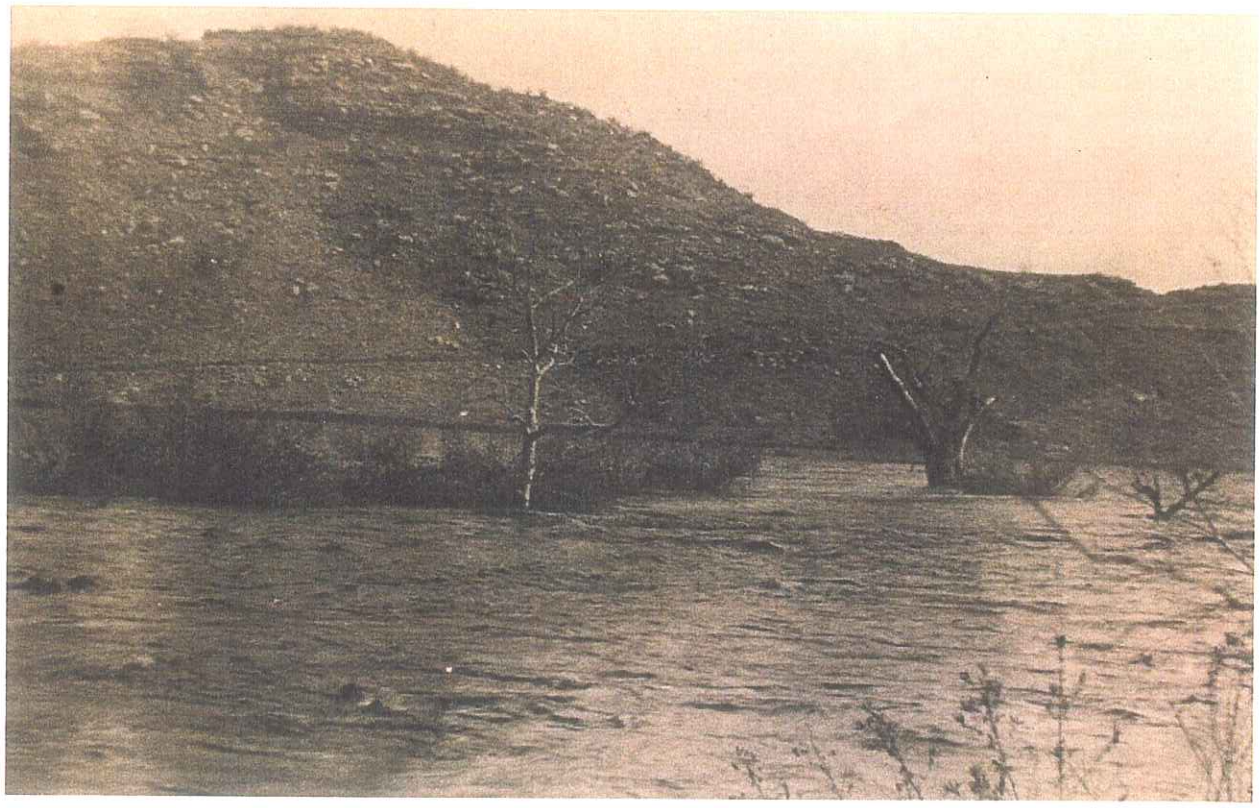

Figure 76. Photograph of "Verde River Looking NE from Base-Ball Grounds, Clarkdale, AZ, Jan. 28, 1916," Jerome Historical Society, Jerome, Arizona

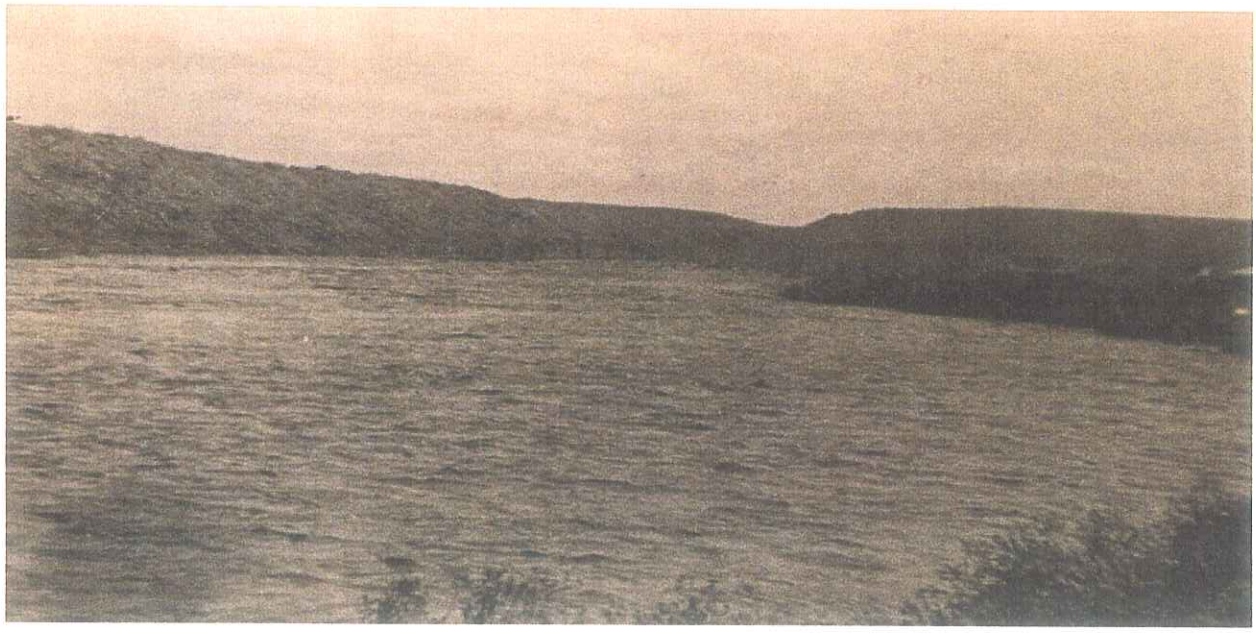

Figure 77. Photograph of "Looking Down the Verde River from Back of Brick Plant, Clarkdale, AZ, Jan. 28, 1916," Jerome Historical Society, Jerome, Arizona

Contrasting images such as these lead to the same conclusion as the textual information. Such drastic changes in the river's condition made the stream completely unreliable for the purposes of navigation. Although this report also includes a photo which shows a boat on the river, it is clear from the majority of photos obtained that boating on the river was the exception rather than the rule and that the river was not reliable for transportation.

E. SUMMARY AND CONCLUSIONS REGARDING MISCELLANEOUS HISTORICAL DOCUMENTS AND PHOTOGRAPHS

The wide variety of the miscellaneous documents and the historical photos discussed above all point to the same conclusion that the Verde River was not navigable prior to or at the time of Arizona statehood in 1912. The photographs and the documents produced by each organization, person, and agency demonstrated characteristics which made the Verde River unreliable for the purposes of consistent navigation. Fluctuating flows, channel changes, and dams all combined to cause major impediments to any sort of transportation on the Verde River.

VII. WESTERN WATERCRAFT AT THE TURN OF THE CENTURY

At the turn of the twentieth century, the only river in the Southwest to be considered by most observers to be navigable was the Colorado. That stream's many sandbars, its widely fluctuating flow, and its generally unpredictable nature made the Colorado a testing ground for boats with shallow drafts and lightweight construction. Many attempts were made to navigate this tempestuous stream from its mouth in the Gulf of California as far upstream as possible, and stories of such expeditions appeared in a multitude of newspapers, promotional publications, as well as in published government documents. The significance of such attempts to navigate the Colorado was not lost on prospective businessmen, possible settlers, and military officials, all of whom hoped for easier access to the interior parts of the southwestern United States. The Colorado, of course, was not the only western river that experienced efforts to navigate it (others included the Columbia, Sacramento, and San Joaquin, to name a few), but the Colorado was the only river that offered possible water-borne access to the American Southwest.

From accounts of river expeditions on the Colorado, therefore, some details about boat technology in relation to southwestern rivers around the time of Arizona statehood can be discerned. This is not to say that river travel was not attempted on other southwestern streams – indeed, it certainly was because water travel in the nineteenth century was by far the most economical method of internal communication. Nevertheless, river navigation on other southwestern streams proved to be unreliable and risky, and the Colorado River was the only stream in the region where sustained attempts at regular navigation occurred. Therefore, a brief examination of the history of navigation on the Colorado can provide useful insight into the

nature and technology of watercraft used for transportation on southwestern rivers at the turn of the century.

Additional information about southwestern watercraft operation can be found in reports written to describe general advances in boat construction. These traits, when combined with experiences on the Colorado River, can help shed light on the navigability of Arizona's streams such as the Verde River.

A. NAVIGATION ON THE COLORADO RIVER

Following the acquisition of much of the western part of the United States in the 1840s and 1850s, federal authorities sent many explorers to the West to determine just what the new territory held. Most often, these parties consisted of military officers who kept journals of their travels, making note of the natural environment, Indians, and possibilities for settlement. Some of these expeditions included references to travel on western rivers, notably the Colorado, although not all specified what types of vessels were used.

Probably the most famous of these was the first expedition of John Wesley Powell through the Grand Canyon on the Colorado River in 1869 (see below for photographs of Powell). Powell, who used a wooden dory to make the first of two descents through the previously unexplored gorge, made it clear after the first trip that while he had survived the experience, the multitude of rapids and other obstacles along this portion of the Colorado made it hardly practicable as a possible water-based access route to the interior part of North America. Indeed, his experiences and those of his companions proved to be so frightening that several of them opted to climb out of the canyon (where they were subsequently killed by Indians) rather than continue on the river.[116]

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[116] See generally Wallace Stegner, *Beyond the Hundredth Meridian: John Wesley Powell and the Second*

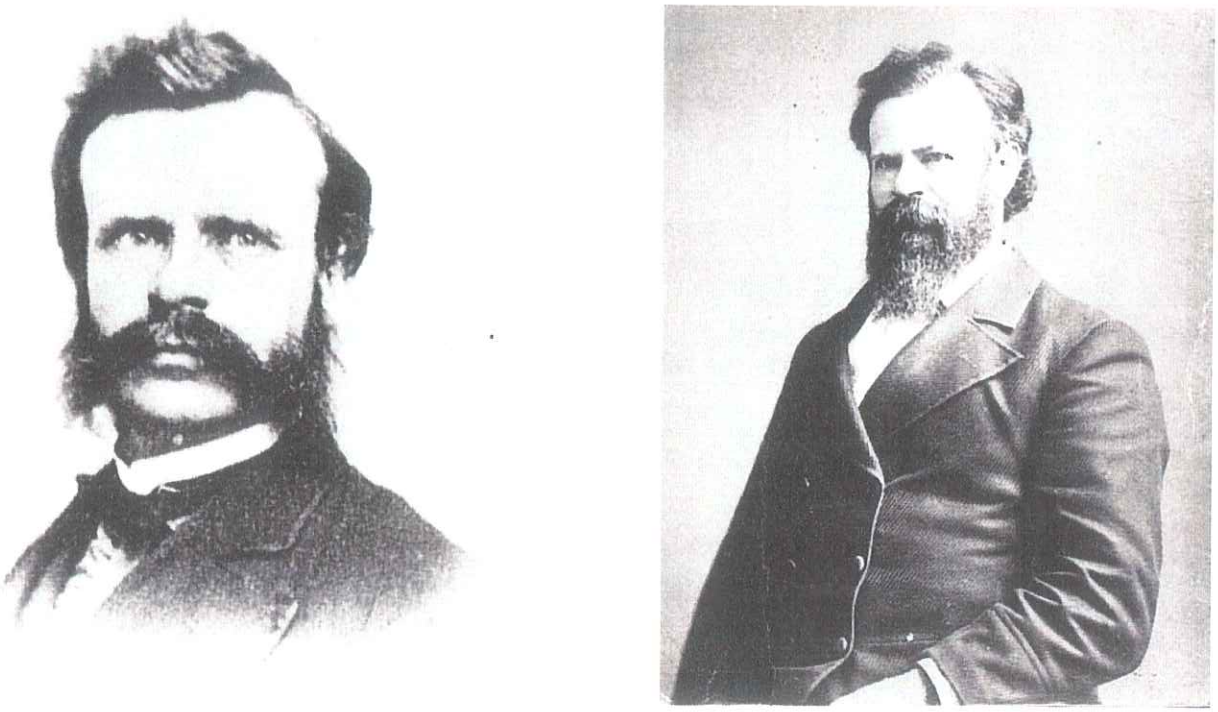

Figure 78. Photographs of John Wesley Powell in 1869 and 1874, U.S. National Park Service

Powell made a second trip down the Colorado River in 1871-1872 that focused more on gathering scientific information than had the first. This second expedition – unlike the first – was made during low water, and while the rapids on this trip were not as frightening as during the first venture down the Colorado, the second expedition still had major difficulties bypassing rocks and rapids.[117] On that expedition Powell brought a photographer, and some of the resulting photographs documented the nature of the dories Powell used on the second trip (see below).

Opening of the West (Boston: Houghton-Mifflin, 1954).

[117] http://3dparks.wr.usgs.gov/3Dcanyons/html/glencanyon.htm (accessed May 9, 2005). For details on Powell's expeditions down the Colorado, see *Exploration of the Colorado River of the West and Its Tributaries Explored in 1869, 1870, 1871 and 1872, under the Direction of the Secretary of the Smithsonian Institution* (Washington, D.C.: U.S. Government Printing Office, 1875).

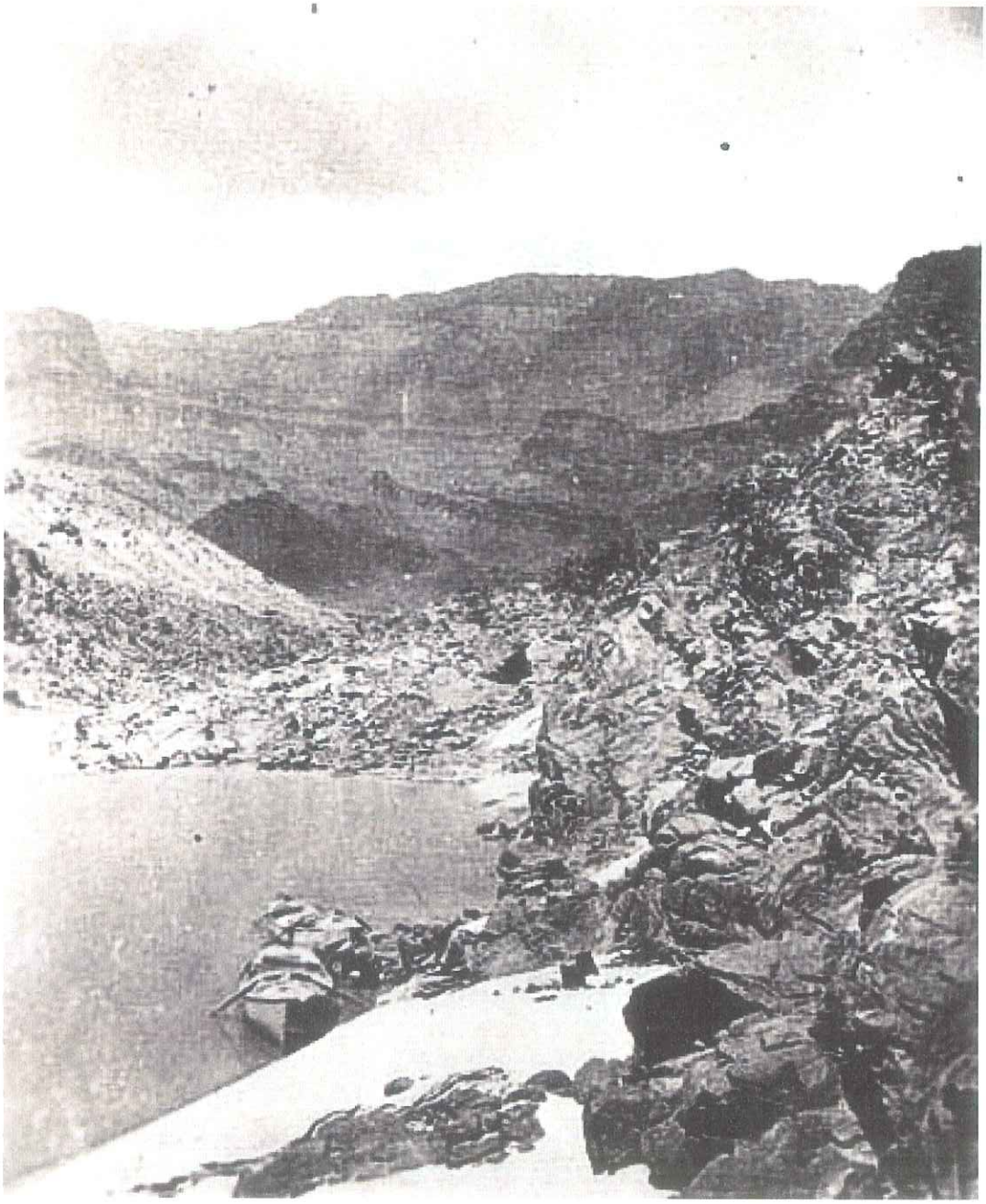

Figure 79. Photograph of Powell's Dories on the Colorado River, 1871-1872, Grand Canyon National Park Collection

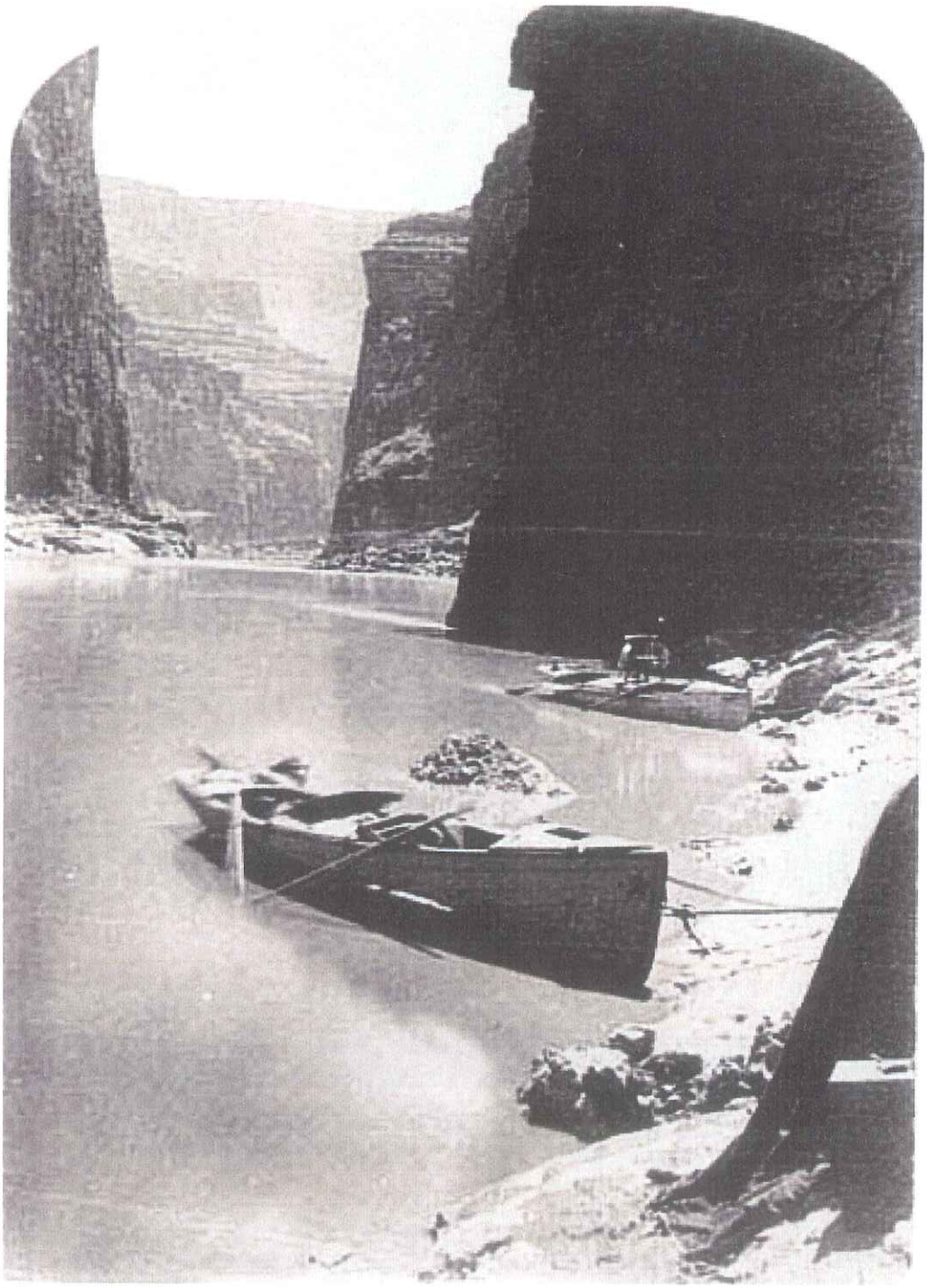

Figure 80. Photograph of a Closer View of Powell's Dories on the Colorado River, 1871-1872, Grand Canyon National Park Collection

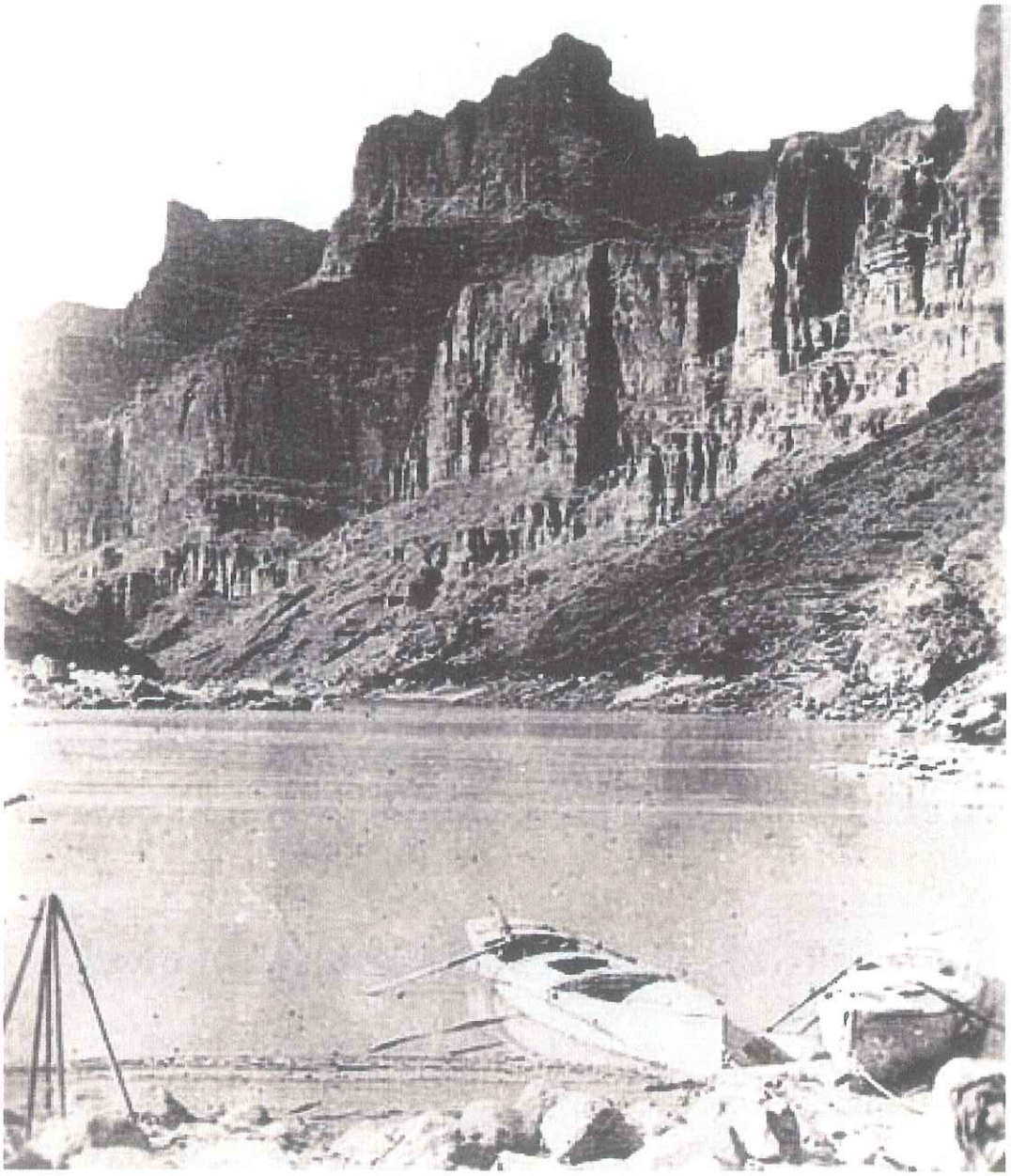

Figure 81. Photograph of Another View of Powell's Dories on the Colorado River, 1871-1872, Grand Canyon National Park Collection

Figure 82. Photograph of Powell's Expedition on the Colorado River, 1871-1872, Grand Canyon National Park Collection

Whereas Powell had chosen to go downstream on the Colorado, other explorers tested the river's navigability by moving upstream from its mouth in the Gulf of California. Lieutenant Joseph Christmas Ives (better known as "J.C." Ives), for example, was one such officer. Ives was sent a decade before Powell made his descent down the Colorado to assess the utility of that stream as a navigable waterway from where it discharged into the Gulf of California upriver to the Virgin River (today, near the central part of Lake Mead). Following his return to the East, Ives completed his report on March 23, 1858. In his account, Ives discussed the problems associated with navigating the Colorado, and he offered a recommendation for the type of boat for future use on the Colorado if the U.S. Government wanted to use it for transportation on a regular basis.

Although his experience was nowhere near the terrifying ordeal later endured by Powell and his colleagues (in part because his exploration was below the Grand Canyon), Ives reported that the Colorado River was extremely difficult to navigate because the "channel is exceedingly

circuitous and constantly shifting." Furthermore, Ives noted repeatedly the presence of sand bars and shoals, writing that

> boats rarely make a trip between tide water and Fort Yuma without grounding many times a day. By working them about in the shifting sand . . . and as a last resort, by lightening the boat of the cargo, these shoals may always be passed with more or less labor.

Due to these hazardous and difficult conditions, Ives recommended an "iron stern wheel boat, with the hull 100 feet long and the greatest breadth of beam 22 feet-built sufficiently [illegible] to ensure a drought when light, not exceeding 12 inches." Although Ives believed that five trips a year could be made on this river in such a watercraft, he repeatedly asserted that it was an extremely troublesome stream to navigate due to the rip and spring tides near its mouth, the constantly shifting channel, the numerous obstacles along the river, and finally, the rapids near the mouth of the Virgin.[118]

Other reports of attempts to navigate the Colorado suggested that the river had greater transportation possibilities than Lieutenant Ives had given it. *The History of Arizona Territory Showing its Resources and Advantages with Illustrations: Descriptive of its Scenery, Residences, Farms, Mines, Mills, Hotels, Business, Houses, Schools, Churches, Etc.* (1884), for instance, provided excellent descriptions of the rivers of Arizona as well as boating in the late nineteenth century. This publication noted that a ship named the *Explorer* soon was expected to ascend the Colorado River. This vessel was fifty-four feet long from the bow to the stern wheel. This was about half the length of Ives's recommended boat, presumably to make the craft more maneuverable in the shifting channel. Nevertheless, the *Explorer*'s draft was reported to be two

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[118] J.C. Ives, "Report Upon Navigable Portion of Colorado River, March 23, 1858," pp. 1, 2, 7, Box 2, Entry 726, Records of the Office of Explorations and Surveys, Miscellaneous Records, Records of the Office of the Secretary of the Interior, Record Group 48, U.S. National Archives II, College Park, Maryland. Ives's report was subsequently published as J.C. Ives, *Report upon the Colorado River of the West, Explored in 1857 and 1858 by Lieutenant Joseph C. Ives, Corps of Topographical Engineers* (Washington, D.C.: U.S. Government Printing Office, 1861).

and a half feet, considerably more than Ives believed to be feasible on the Colorado River, at least if it was to ascend as far as the Virgin River.[119]

While this account of a watercraft capable of navigating the Colorado was more promising than that offered by Lieutenant Ives, its tone of confidence, however, should be tempered with the knowledge that the book – as its title suggested and like many similar regional chronologies of the day – had been paid for by western promoters eager to attract businesses and settlers to the sparsely populated part of the United States. Ives's report, therefore, is probably more objective regarding the Colorado's possibilities as a transportation artery, at least below the Grand Canyon. Nevertheless, other attempts by paddle wheel steamboats confirmed that the Colorado River could, in fact, be used by such craft.[120]

Other accounts printed in U.S. Government documents further acknowledged the possibilities of using the Colorado below the Grand Canyon as an artery of commerce and transportation. A letter from Mr. J.A. Mellon, master of the Colorado River steamer *Cochran*, to the Bureau of Corporations written on January 30, 1907, noted that his ship weighed 237 tons and drew 20 inches of water when light and an additional 1 inch of water for every 10 tons of freight. At the end of his letter, Mellon wrote that "I have come to the conclusion that any river that has over 4 feet fall to the mile can not compete with a railroad for freight or passengers." According to other records of the Bureau of Corporations, another Colorado ship (actually, more like a barge), the *Silas J. Lewis*, weighed 100 tons, drawing seven inches of water with no load and one inch more for every eleven tons.[121]

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[119] *History of Arizona Territory Showing its Resources and Advantages with Illustrations: Descriptive of its Scenery, Residences, Farms, Mines, Mills, Hotels, Business, Houses, Schools, Churches, Etc.* (San Francisco: Wallace W. Elliot & Co., 1884).

[120] For details on various steamboats used on the Colorado River, see Kay Muther, "Paddle-wheelers on the Colorado," *Wild West Magazine*, Aug. 2004.

[121] *Report of the Commissioner of Corporations on Transportation by Water in the United States, Water-Borne Traffic* (Washington D.C.: U.S. Government Printing Office, 1909), pp. 370-371.

B. WESTERN WATERCRAFT IN GENERAL

Regarding western rivers more generally, the 1909 report of the Commissioner of Corporations provided additional insight on the state of navigation in the Southwest around the time of Arizona statehood in 1912. This document contained information about the types of vessels being used for navigation at the time. The report noted that "[o]n the western rivers there soon appeared the well-known flat-bottom, stern-wheel steamboat, adapted to the shallow waters of those streams, the design of which has not greatly changed for half a century." "[T]hose [vessels]," the report added, "used in the river trade are still mainly built of wood."[122] When specifically discussing river steamers, the report stated that:

> [r]equirements on the western rivers are the least possible load draft, economical speed, readiness of handling the vessel, and freight and passenger capacity. In the case of towboats large reserve power is an important item.[123]

Although the report conceded that little change had been made in the stern-wheel, light-draft steamers in two decades, it declared that recently "a new type of light-draft steamer has been developed, with screwpropeller built in a tunnel in the after part of the vessel."[124]

Water Trails West, a more recent (and more objective) compilation of essays by western writers regarding various western streams, included one article which contained additional information about navigation on the Colorado River as well as other western waterways. This essay, by Donald H. Bufkin and C.L. Sonnichsen, indicated that boats larger than that proposed by Ives were used successfully on the Colorado. According to Bufkin and Sonnichsen, the largest ship to use the Colorado was the *Mohave II*. With a length of 175 feet (over three times

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[122] *Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water* (Washington D.C.: U.S. Government Printing Office, 1909), pp. 128-129.

[123] *Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water* (Washington D.C.: U.S. Government Printing Office, 1909), p. 138.

[124] *Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water* (Washington D.C.: U.S. Government Printing Office, 1909), p. 139.

that of the *Explorer* described in the *History of Arizona Territory* and one and three quarters as long as Ives' boat), the *Mohave II* had a 32-foot beam. This was 10 feet wider than Ives' recommendation. The *Mohave II* was approximately 190 tons and drew less than two feet of water. (Ives suggested only one foot, while the *History of Arizona* claimed two and a half). Other boats similar to the *Mohave II* in use in the West, according to Bufkin and Sonnichsen, were all over 100 feet in length and over 25 in width. Further, these vessels were generally stern-wheeled, making them easier to navigate streams filled with sandbars and shallow water.[125]

C. SUMMARY AND CONCLUSIONS REGARDING WESTERN WATERCRAFT

The state of boating technology around the turn of the century make it clear that the Verde River was not susceptible to navigation at the time of Arizona statehood. The flow in the Verde, while perennial, was not consistent enough to support the boats used for transport. A draft of two feet could not be had in a river that was sometimes only a few inches deep. Even the dories used by John Wesley Powell to go down the Colorado River would have had a difficult time using the Verde River on a reliable basis. Furthermore, the Verde's shifting nature made its course unreliable as well as dangerous. The status of watercraft at the time of Arizona's statehood in 1912 – as described in historical literature and illustrated in photographs – make it clear that no such vessels could be utilized on a regular and reliable basis on the Verde River.

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[125] Donald H. Bufkin and C.L. Sonnichsen, "Steamboat Through Hell: River Traffic on the Colorado of the West," in *Water Trails West*, (Garden City: Doubleday & Company, 1978), pp. 218-230.

VIII. GENERAL SUMMARY AND CONCLUSIONS REGARDING THE VERDE RIVER

Since modern settlement began in the central Arizona area in the mid-nineteenth century, there have been a multitude of documents created describing the Verde River. These cover a wide spectrum of published and unpublished sources, including federal and state (and territorial) materials, diaries, journals, reminiscences, photographs, and other archival records.

Some of the most important sources for ascertaining the nature of the Verde River prior to and at the time of Arizona's statehood in 1912 are survey field notes and plats created by U.S. Government surveyors as they carried out their responsibilities mapping Arizona. Directed by manuals conveying precise instructions, surveyors were to make careful note of the region in which they were working, and they were provided with specific instructions about how to record the presence of navigable bodies of water. A substantial part of the area through which the Verde River flowed was surveyed prior to 1912, and in some cases resurveys were done for some sections of the river. Significantly, although these surveys were undertaken by many different parties at different times and under various seasonal conditions, none of the federal surveyors indicated in his field notes or on the related plats that the Verde River was navigable. While some sections of the stream were, in fact, meandered, the surveyors' field notes clearly show that those meanders had been done to conform with surveying instructions not related to navigability. In addition, the field notes and plats illustrated a stream that varied enormously in flow and that had a changing channel in many places. Moreover, the notes and plats contain references to roads paralleling the Verde, especially in the fertile Verde Valley, suggesting that transportation was carried out on land and not on the river.

Supporting the U.S. Government surveys' determination that the Verde River was not navigable are federal government homestead patents, U.S. grants to Arizona, and Arizona's disposition of those lands. Over 120 patents were issued by the U.S. Government Land Office to parcels of land through which the Verde River ran. In every single case when these patents were formalized, the United States made no effort to deny title to the applicants based on a possible claim of ownership due to Arizona's sovereignty. Furthermore, when lands were granted to Arizona through which the Verde River flowed, the State made no effort to obtain in-lieu selections for the acreage covered by the stream's bed – as it would have been entitled to do had the Verde River been navigable at the time of statehood. And, when Arizona subsequently disposed of lands it had acquired from the federal government through which the Verde River ran, the State made no indication that it was withholding the bed of the river due to navigability and the public's interest.

The federal and state grant and patenting process is significant in relation to determining the Verde River's navigability because with so many different parcels and transfers of land involved, a large number of parties ultimately reached the same conclusion – that the Verde River was not navigable. Each applicant who requested land through which the river flowed implicitly asserted the river's non-navigability; each federal official approving a homestead application or grant to Arizona reached the same implicit conclusion, as did each State authority who sold Arizona's federally-granted lands. Not only did many individuals all indicate the same finding with regard to the Verde River's non-navigability, but they did so over a lengthy span of time, and their actions covered a large and diverse geographic area.

Further strengthening the finding that the Verde River was not navigable in 1912 are other published and unpublished records of the U.S. Government. Records of the U.S.

Geological Survey, the Reclamation Service, and the Indian Service all described a stream that was extremely erratic in flows, unreliable in relation to channels, subject to severe floods, and potentially dangerous.

Much like the federal agencies' records, explorers' journals, personal reminiscences, other historical documents, and more recent historical studies all reached the same conclusion regarding the lack of navigability of the Verde River. Indeed, the Arizona Territorial Legislature, as one of its first acts in 1865, declared that the only stream in Arizona that was navigable was the Colorado, and Karen Smith, historian of the Salt River Project, declared in her seminal study of that federal undertaking that the Phoenix area had never had any port on a navigable body of water. Photographs of the Verde prior to or near the time of statehood add further evidence that the stream could hardly be considered navigable.

From this wealth of information, covering a huge array of documentary sources, only one conclusion can be reached: The Verde River was not navigable on or before February 14, 1912.

IX. APPENDIX A – UNPUBLISHED RECORDS – ARCHIVES AND AGENCIES

ARIZONA STATE UNIVERSITY (ARIZONA HISTORICAL FOUNDATION)

FILE TITLE: 4331 P3 P25 1880 AZ
COLLECTION:
LOCATION:
ARCHIVE: ASU-Arizona Historical Foundation

FILE TITLE: "Arizona Newspaper Project"
COLLECTION: Newspaper Index
LOCATION:
ARCHIVE: ASU-Arizona Historical Foundation

ARIZONA STATE UNIVERSITY (LUHRS SPECIAL COLLECTIONS)

FILE TITLE: (1954) Combined Flow of Salt and Verde Rivers, Reservoir Capacity and Water Stored, 1889-1953
COLLECTION:
LOCATION:
ARCHIVE: ASU-Luhrs

FILE TITLE: (1957) Graph of Combined Flow of Salt and Verde Rivers
COLLECTION:
LOCATION:
ARCHIVE: ASU-Luhrs

ARIZONA STATE ARCHIVES, PHOENIX

FILE TITLE: Report of the Governor of Arizona to the Secretary of the Interior, 1885
COLLECTION: Record Group 6, Secretary of the Territory
LOCATION: Box 41, Record Group6, 1869-1881 41:580
ARCHIVE: Arizona State Archives

FILE TITLE: Report of the Governor of Arizona to the Secretary of the Interior, 1889
COLLECTION: Record Group 6, Secretary of the Territory
LOCATION: Box 43, Record Group 6 1882-1889, 43:607
ARCHIVE: Arizona State Archives

FILE TITLE: Report of the Acting Governor of Arizona to the Secretary of the Interior, 1890
COLLECTION: Record Group 6, Secretary of the Territory
LOCATION: Box 44, Record Group6, 1885-1890 44:621
ARCHIVE: Arizona State Archives

FILE TITLE: Stream Discharge Summary, Combined Flow of Salt and Verde Rivers Above Granite Reef, Chart Prepared by D.M. Lewis (?) on April 8, 1936
COLLECTION: Records of the Arizona State Planning Board
LOCATION: 1910-1938, Box 1
ARCHIVE: Arizona State Archives

FILE TITLE: (1936) Stream Discharge Summary, Combined Flow of Salt and Verde Rivers above Granite Reef, Chart prepared by D.M. Lewis (?) on April 8, 1936
COLLECTION: Records of the Arizona State Planning Board, 1910-1938
LOCATION: Box 1
ARCHIVE: Arizona State Archives

FILE TITLE: "Combined Flow, Salt and Verde Rivers"
COLLECTION: Water Commissioner of Maricopa County
LOCATION: Microfilm Roll 137.1.5
ARCHIVE: Arizona State Archives

ARIZONA STATE LAND DEPARTMENT, PHOENIX

FILE TITLE: Arizona Stream Navigability Study for the Verde River: Salt River Confluence to Sullivan Lake
COLLECTION:
LOCATION:
ARCHIVE: Arizona State Land Department

FILE TITLE: Microfiche copies of field notes and survey plats for Gila and Verde Rivers
COLLECTION:
LOCATION:
ARCHIVE: Arizona State Land Department

FILE TITLE: State Patents and State Plats Overlying the Verde River
COLLECTION:
LOCATION:
ARCHIVE: Arizona State Land Department

ARIZONA STATE LIBRARY, PHOENIX

FILE TITLE: Map Showing Agricultural Land and Ditches of the Verde Valley
COLLECTION: Map Collection
LOCATION:
ARCHIVE: Arizona State Library

CALIFORNIA STATE LIBRARY, SACRAMENTO

FILE TITLE: Lewis Birdsall Harris to brother Clinton, June 16, 1850
COLLECTION: Lewis Birdsall Harris Collection
LOCATION:
ARCHIVE: California State Library

CAMP VERDE HISTORICAL SOCIETY, CAMP VERDE, ARIZONA

FILE TITLE: Verde Valley Ditches
COLLECTION: vertical files
LOCATION: vertical files
ARCHIVE: Camp Verde Historical Society

FILE TITLE: Verde Valley Homesteaders
COLLECTION: vertical files
LOCATION: vertical files
ARCHIVE: Camp Verde Historical Society

FORT VERDE HISTORICAL PARK, CAMP VERDE, ARIZONA

FILE TITLE: Photo collection
COLLECTION: vertical files
LOCATION: vertical files
ARCHIVE: Fort Verde State Historical Park

SALT RIVER PROJECT, PHOENIX

FILE TITLE: "Drainage Map of Arizona Showing Perennial Streams and Some Important Wetlands"
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: "Salt River Project, Arizona - Project History, Year 1911"

COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: (1988) "An Historical Analysis of the Salt River, 1830-1912"
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: (April-May, 1915) Water Power Utilization in Arizona, "Part I, Introduction" and "Salt River & Smaller Tributaries"
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Water Power Development papers, Misc.
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Inspection Report. Report of Inspector Joe H. Norris, Agency or School, Camp McDowell, Arizona, Date of Report April 9, 1910, Section 1, Subject Land, Water and Timber
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: [Letter from C.F. Larrabee to Charles W. Goodman, May 19, 1905]
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: [Letter from C.R. Olberg to W.H. Code, February 10, 1909]
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: [Letter from J.R. Meskimons to the Com. Indian Affairs, May 20, 1905]
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: [Letter from Meskimons to Com. Ind. Affairs, April 15, 1905]
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: In the Court of Claims, No. 13,861, Congressional. Anna E. White Shipp, et al., Petitioners, v. The United States. Claimants' Brief on Merits
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Letter from W.H. Gill to "Friends," April 20, 1905
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Report of Farmer in Charge of Camp M'Dowell Reservation, Phoenix, Ariz, September 22, 1905
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Report Upon a Municipal Water Works System for Phoenix, Arizona, May 22nd, 1906
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE:
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Report on the Proposed Verde River Forest Reserve, Arizona, 1904
COLLECTION:
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: Rio Verde Canal Co.
COLLECTION: Bartlett Dam AZ HAER No. 25
LOCATION: Research Materials, Box 2 of 3
ARCHIVE: Salt River Project Archives

FILE TITLE: M. Wormser, et al. vs. The Salt Valley Canal Co., et al.
COLLECTION: Court cases
LOCATION:
ARCHIVE: Salt River Project Archives

FILE TITLE: "Ap. 21, 1903 to Ap. 16, 1904; p. 2450-2699"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders

ARCHIVE: Salt River Project Archives

FILE TITLE: "Feb. 14, 1902 to Ap. 20, 1903; p. 2200-2449"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives

FILE TITLE: "Jan. 1912 to Nov. 1912"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives

FILE TITLE: "Newsclips 2/1904 - 10/1906"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives

FILE TITLE: SRP 1, Roll 23
COLLECTION: Record Group 115, 1902-1919
LOCATION: SRP 1, Roll 23
ARCHIVE: Salt River Project Archives

FILE TITLE: Roll 1, Headquarters Records, Ft. Verde, Letters, Telegrams Sent, July 2, 1873 - Mar. 18, 1891
COLLECTION: Record Group 393, Records of the Adjutant General
LOCATION: M1076
ARCHIVE: Salt River Project Archives

FILE TITLE: Roll 10, Headquarter Records, Ft. Verde, AZ, Special Orders Received, Orders Rec'vd Misc. Commands, 1868-83
COLLECTION: Record Group 393, Records of the Adjutant General
LOCATION: M1076
ARCHIVE: Salt River Project Archives

FILE TITLE: Roll 11, Headquarters Records, Ft. Verde, Az., Miscellaneous Records, 1869-1891
COLLECTION: Record Group 393, Records of the Adjutant General
LOCATION: M1076
ARCHIVE: Salt River Project Archives

U.S. BUREAU OF LAND MANAGEMENT, PHOENIX

FILE TITLE: Master Title Plat and Historical Index for Township 10 North, Range 6 East
COLLECTION:
LOCATION:

ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 11 North, Range 6 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 12 1/2 North, Range 4 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 12 North, Range 5 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 12 North, Range 6 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 13 North, Range 5 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 14 North, Range 4 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 14 North, Range 5 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 15 North, Range 3 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 15 North, Range 4 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 16 North, Range 3 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 17 North, Range 1 West
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 17 North, Range 2 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 17 North, Range 3 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 18 North, Range 1 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 18 North, Range 1 West
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 18 North, Range 2 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 2 North, Range 7 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 3 South, Range 7 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 4 North, Range 7 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 5 North, Range 7 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 6 North, Range 7 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 7 North, Range 7 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 8 North, Range 6 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 9 1/2 North, Range 6 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 9 North, Range 6 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Tract Book for Township 14 North, Range 5 East
COLLECTION:
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Federal Land Patents overlying Verde River
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes and Survey Plat for Township 13 North, Range 5 East

COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes and Survey Plat for Township 2 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes and Survey Plat for Township 3 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes and Survey Plat for Township 5 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 10 North, Range 6 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 11 North, Range 6 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 11 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 12 North, Range 5 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 12 North, Range 6 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 12.5 North, Range 4 East
COLLECTION: General Land Office

LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 6 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 7 North, Range 6 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 7 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 9 North, Range 6 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Field Notes for Township 9.5 North, Range 6 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 2 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Master Title Plat and Historical Index for Township 3 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 16 North, Range 3 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 14 North, Range 4 East
COLLECTION: General Land Office
LOCATION:

ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 15 North, Range 3 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 15 North, Range 4 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 17 North, Range 1 West
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 17 North, Range 2 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 17 North, Range 3 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 18 North, Range 1 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 18 North, Range 1 West
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 18 North, Range 2 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Plats and Field Notes for Township 4 North, Range 7 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

FILE TITLE: Survey Plat for Township 14 North, Range 5 East
COLLECTION: General Land Office
LOCATION:
ARCHIVE: U.S. Bureau of Land Management

U.S. LIBRARY OF CONGRESS, WASHINGTON, D.C.

FILE TITLE: Verde River Irrigation, Dec. 1935
COLLECTION: Papers of William E. Borah
LOCATION: Box 434
ARCHIVE: Library of Congress

U.S. NATIONAL ARCHIVES – ROCKY MOUNTAIN REGION, DENVER

FILE TITLE: "Project History, Verde Project, Arizona, Volume I-Calendar Year 1933"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Engineering & Research Center PROJECT HISTORIES
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "Phelps Dodge Corporation Morenci Water Development Horseshoe Dam Unit on Verde River, Maricopa County, Arizona, January, 1944"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Engineering & Research Center PROJECT REPORTS
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "Salt River Project, Final History (to 1916)"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 142
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "Salt River Project-Annual Project History, 1916"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 142
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "Annual Report of Operation and Maintenance for the Agricultural Year 1914-1915"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 158
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "118 SALT RIVER PROJECT. Settlement of Water Rights Thru 1913 118"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation

LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "118 SALT RIVER PROJECT. Settlement of Water Rights, 1914 thru June 1919 118"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "261 SALT RIVER PROJECT. Salt River Valley WUA May 1 to Dec 31, 1905 261"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "261 SALT RIVER PROJECT. Salt River Valley WUA, Thru May, 1903 261"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "54-B3 SALT RIVER. Repayments: Corres. re: Furnishing Flood Waters to Water Users 54-B3"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: 929-4 ARIZONA Surveys & Investigations PARADISE VALLEY (Verde River) THRU MAY 1918. 929-4
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, Box 299
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineer Reports, January 1, 1907 - December 31, 1912."
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1913 - December 31, 1913"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1914 - December 31, 1914."

COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT. Board of Survey Reports. 544-D"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT. Classification of Lands, Soil Surveys 559"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT. Consulting Engineers Reports, Thru 1906"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey 544-D"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey. Jan 1, 1916 to 544-D"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "SALT RIVER PROJECT. Water Appropriations"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "023.6- VERDE RIVER Verde Irrigation, Press Releases Thru 1929"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "032.-SALT RIVER PARADISE VERDE, Water Rights, Settlement of Indian Thru 1929, 032.-"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "090. SALT RIVER PARADISE VERDE Miscellaneous Thru 1929"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "140. SALT RIVER PARADISE VERDE Legislation Thru 1929 140."
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "222.- SALT RIVER PARADISE VERDE Drainage. Verde River Irrigation and Power Dist. Thru 1929 222.-"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "301. SALT RIVER PARADISE VERDE Engineering Reports & Estimates Thru 1929 301."
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "301. VERDE RIVER Report dated 1920 by the Beckman & Linden Engineering Corporation. 301."
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

FILE TITLE: "301. VERDE RIVER. Engineering Reports Thru 1920"
COLLECTION: Record Group 115, U.S. Bureau of Reclamation
LOCATION: Entry 7, General Administrative and Project Records, 1919-1929, Verde/Paradise Verde Project
ARCHIVE: National Archives-Rocky Mountain Region

U.S. NATIONAL ARCHIVES – SOUTHWEST REGION, LAGUNA NIGUEL

FILE TITLE: Palo Verde Project: 860-M : - Reports: Misc.
COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior, Office of the Solicitor

LOCATION: Miscellaneous Projects, Box 6 (Palmdale Project to Palo Verde Project)
ARCHIVE: U.S. National Archives branch, Southwest Region

U.S. NATIONAL ARCHIVES, WASHINGTON, D.C.

FILE TITLE: Vol. 9 of 14, Fort McDowell, AR
COLLECTION: Record Group 393, Records of the U.S. Army Commands
LOCATION: Entry 2
ARCHIVE: U.S. National Archives

FILE TITLE: "Volume 1, Letters Sent From Aug. 18, 1865 to Oct. 11, 1867"
COLLECTION: Record Group 393, Records of the U.S. Army Commands
LOCATION: Entry 2, Letters Sent, August 18, 1865 to Oct. 11, 1867, Fort McDowell, Arizona
ARCHIVE: U.S. National Archives

FILE TITLE: "Arizona, Camp McDowell"
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Abandoned Military Reservations File, Arizona, Camp McDowell-Target Ranges, Box 15'
ARCHIVE: U.S. National Archives

FILE TITLE: Camp Verde, Arizona, See Fort Verde
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Division "K" Abandoned Military Reservation Files, Box 16
ARCHIVE: U.S. National Archives

FILE TITLE: "Verde River Irrigation & Power District, Canal and Reservoir File"
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Division "K" Abandoned Military Reservation Files, Box 17
ARCHIVE: U.S. National Archives

FILE TITLE: No Title: Will insert blank page with "Untitled" written on it
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Division "K" Abandoned Military Reservation Files, Box 17
ARCHIVE: U.S. National Archives

FILE TITLE: Rio Verde Canal Co.
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 569, Division "F" Old Canal and Reservoir Files, 1891-1929, Box 14
ARCHIVE: U.S. National Archives

FILE TITLE: Paradise Valley Water Users Asso.
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 146
ARCHIVE: U.S. National Archives

FILE TITLE: Paradise Verde Water Users Ass No. 2
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 146
ARCHIVE: U.S. National Archives

FILE TITLE: Upper Verde Reservation Ditch and Water Right
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 194
ARCHIVE: U.S. National Archives

FILE TITLE: Central Verde Ditch, Arizona
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 32
ARCHIVE: U.S. National Archives

FILE TITLE: "66254 - 1913 (1) Camp Verde 308"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 121, Camp Verde, Decimal No. 308, Land Allotments-Box 1600
ARCHIVE: U.S. National Archives

FILE TITLE: "6624 - 1913 (2) Camp Verde 308"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 121, Camp Verde, Decimal No. 308, Land Allotments-Box 1601
ARCHIVE: U.S. National Archives

FILE TITLE: "66254 - 1913 (3) Camp Verde 308"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 121, Camp Verde, Decimal No. 308, Land Allotments-Box 1601
ARCHIVE: U.S. National Archives

FILE TITLE: "12718 1926 Camp Verde 341"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 121, Camp Verde, Decimal No. 341, Land Allotments-Box 1601
ARCHIVE: U.S. National Archives

FILE TITLE: "56540 1926 Camp Verde 341"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 121, Camp Verde, Decimal No. 341, Land Allotments-Box 1601
ARCHIVE: U.S. National Archives

FILE TITLE: "Camp McDowell 1905"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 653, District 4, Box 73
ARCHIVE: U.S. National Archives

FILE TITLE: "Camp McDowell 1906"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 653, District 4, Box 73
ARCHIVE: U.S. National Archives

FILE TITLE: "Camp McDowell 1909"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 653, District 4, Box 73
ARCHIVE: U.S. National Archives

FILE TITLE: "Annual Report of Chief Engineer, 1913"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 654, Box 1
ARCHIVE: U.S. National Archives

FILE TITLE: "Resume of Irrigation Conditions End of Fiscal Year 1914, June 30, 1914"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 655, Box 29
ARCHIVE: U.S. National Archives

FILE TITLE: Report on Flood Damage, Camp McDowell Res., C.R. Olberg Feb. 1916
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 657, Box 48, Reports and Related Records, 1891-1946
ARCHIVE: U.S. National Archives

FILE TITLE: Report on Irrigation of Camp McDowell Indian Res. Ariz. F.R. Schanck, Feb 1913
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 657, Box 48, Reports and Related Records, 1891-1946
ARCHIVE: U.S. National Archives

FILE TITLE: "Report on the Irrigation of the Ft. McDowell Indian Res. Verde River Valley, Ariz. to R.G. Valentine, W.H. Roscrans, Aug 31, 1916"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 657, Salt River-Verde, Box 48
ARCHIVE: U.S. National Archives

FILE TITLE: "Report on Proposed Irrigation Project, McDowell Res., Ariz. C.R. Olberg. Jan. 1916, Vol. 1"
COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs
LOCATION: Entry 657, Salt River-Verde, Box 49
ARCHIVE: U.S. National Archives

FILE TITLE: "Fort McDowell, Arizona"
COLLECTION: Record Group 94, Records of the Adjutant General's Office, 1780s-1917, Records of Divisions

LOCATION: Box 65, Military Reservation Division, early 1800s-1916
ARCHIVE: U.S. National Archives

FILE TITLE: "Medical Histories of Posts, Fort McDowell, 1865 to December 1872"
COLLECTION: Record Group 94, Records of the Adjutant General's Office, 1780s-1917, Records of Divisions
LOCATION: Vol. 35
ARCHIVE: U.S. National Archives

FILE TITLE: "Medical History of the Post, Fort McDowell Arizona Territory, Department of Arizona, January, 1884"
COLLECTION: Record Group 94, Records of the Adjutant General's Office, 1780s-1917, Records of Divisions
LOCATION: Vol. 39
ARCHIVE: U.S. National Archives

FILE TITLE: VERDE - post, camp or Fort. Aban. Military Res. - Arizona
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 690, Abandoned Military Reservation Files, Box 17
ARCHIVE: U.S. National Archives

FILE TITLE: Box 158A, Tonto National Forest, Folder 1
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 918, National Forests, 1891-1955
ARCHIVE: U.S. National Archives

FILE TITLE: Box 35, Coconino National Forest
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Entry 918, National Forests, 1891-1955
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 129, John Wood
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 130, Reuben C. Campbell
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 134, Bradley C. Rain
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 144, George W. Hull
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 148, Preston W. Burford
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 149, Josiah Marr
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 157, Mitchel Burch
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 158, William Munds
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 162, David W. Strahan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 174, Andrew J. Winningham
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 185, Everett A. Jordan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 215, John C. Duff
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 220, Alonzo Bristow

COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 237, William F. Wilber
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 238, Robert M. Rogers
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 250, Frank Knell
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 277, Thomas R. King
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 318, Farrall Tiernan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 329, James Brown
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Cash Entry Patent File 330, Willie A. Jordan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Desert Land Entry Patent 439098, Dea Mee Get
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Desert Land Entry Patent File 717758, Ada D. Andrews
COLLECTION: Record Group 49, U.S. General Land Office

LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Forest Lieu Patent File 264746, Santa Fe Pacific Railroad Company
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Forest Lieu Patent File 580415, Santa Fe Pacific Railroad Company
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 155, David Scott
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 158, William Nichols
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 166, Jackson Thompson
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 169, Henry Williams
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 171435, Louis Tiszo
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 187, Lewis A. Willard
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 192, James M. Williams
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents

ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 198, Thomas F. Peters
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 199, Henry J. Peters
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 220, John C. Duff
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 228, Thomas Carroll
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 253, Leonard Carroll, Sr.
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 290917, John Thomas Logan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 307045, Josiah L. Murdock
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 349, John T. Nelson
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 350305, David Strahan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 363, John W. Ralston
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 364, William S. Head
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 431987, L. William Pugh
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 444072, Joseph Brazil
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 465357, John N. Alexander
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 512, John B. Ricketts
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 522538, Louis Tiszo
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 532826, Luis Lopez Reyes
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 539, William H. Hawkins
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 546, Lennie Young
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 564, Jules J. Humbert
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 565, August J. Humbert
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 590591, Harlin Wood
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 624521, Benjamin McDonald
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 646, Wallace B. Willard
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 666, Ralph A. Dykstra
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 680819, Caroline E. Adams
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 716502, John F. Ralston
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 728034, Patrick F. Geary

COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 737605, Lee Smart
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 793381, Timothy P. Sullivan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 844648, Joseph H. Morrison
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 850, George C. Brown
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Homestead Entry Patent File 88473, Samuel G. Wallingford
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

FILE TITLE: Mining Entry Patent File 335072, Sycamore Mining Smelting and Development Company
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives

U.S. NATIONAL ARCHIVES II, COLLEGE PARK, MARYLAND

FILE TITLE: File 2184
COLLECTION: Record Group 57, Records of the U.S. Geological Survey
LOCATION: Entry 369, Conservation Division, Water and Power Branch, Records Concerning Land and Stream Classification, 1900-61
ARCHIVE: U.S. National Archives II

FILE TITLE: Progress Report upon Geographical and Geological Explorations and Surveys West of the 100th Meridian in 1872...

COLLECTION: Record Group 57, Records of the U.S. Geological Survey, Wheeler Survey
LOCATION: Entry 20, Report on Wheeler Survey in 1872, Box 1
ARCHIVE: U.S. National Archives II

FILE TITLE: Coconino National Forest Atlas
COLLECTION: Record Group 95, U.S. Forest Service Cartographics
LOCATION: Entry 65, Forest Atlases, 1908-25
ARCHIVE: U.S. National Archives II

FILE TITLE: Prescott National Forest Atlas
COLLECTION: Record Group 95, U.S. Forest Service Cartographics
LOCATION: Entry 65, Forest Atlases, 1908-25
ARCHIVE: U.S. National Archives II

FILE TITLE: Tonto National Forest Atlas
COLLECTION: Record Group 95, U.S. Forest Service Cartographics
LOCATION: Entry 65, Forest Atlases, 1908-25
ARCHIVE: U.S. National Archives II

UNIVERSITY OF ARIZONA

FILE TITLE: Notes and Description of Life and Events at Old Camp Lincoln, Arizona, and New Camp Lincoln on the Rio Verde in 1865-66
COLLECTION: Unpublished manuscript
LOCATION:
ARCHIVE: University of Arizona Library

UTAH STATE HISTORICAL SOCIETY

FILE TITLE: Guy M. Keysor Journal
COLLECTION: Guy M. Keysor
LOCATION:
ARCHIVE: Utah State Historical Society

WATER RESOURCES CENTER ARCHIVES, BERKELEY, CALIFORNIA

FILE TITLE: Storage Irrigation System of the Rio Verde Canal Co. of Phoenix, Arizona
COLLECTION: James Dix Schuyler Collection
LOCATION: 138-Part 1
ARCHIVE: Water Resources Center Archives

FILE TITLE: Rio Verde Canal and Reservoirs
COLLECTION: James Dix Schuyler Collection

LOCATION: 138-Part 2
ARCHIVE: Water Resources Center Archives

FILE TITLE: Report Upon the Development and Distribution of the Water Resources of Salt River Valley, Arizona
COLLECTION: Joseph B. Lippincott Collection
LOCATION: 52-2
ARCHIVE: Water Resources Center Archives

X. APPENDIX B – PUBLISHED SOURCES

BOOKS AND PUBLISHED GOVERNMENT DOCUMENTS

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XI. APPENDIX C – FEDERAL AND STATE PATENTS

FEDERAL PATENTS

LOCATION Township 13N, Range 5E, Section 5
PATENT TYPE AND NUMBER: HE 307045
DATE: 01/02/1913

LOCATION Township 13N, Range 5E, Section 5
PATENT TYPE AND NUMBER: HE 624521
DATE: 04/11/1918

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: CE 344278
DATE: 06/26/1913

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: CE 344278
DATE: 06/26/1913

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: CE 626
DATE: 09/30/1899

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: CE 654
DATE: 06/11/1900

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: CE 705
DATE: 05/06/1907

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: HE 364
DATE: 10/16/1895

LOCATION Township 13N, Range 5E, Section 6
PATENT TYPE AND NUMBER: HE 364
DATE: 10/16/1895

LOCATION Township 13N, Range 5E, Section 7
PATENT TYPE AND NUMBER: CE 655
DATE: 10/04/1900

LOCATION Township 13N, Range 5E, Section 7
PATENT TYPE AND NUMBER: HE 1108800
DATE: 07/19/1940

LOCATION Township 13N, Range 5E, Section 7
PATENT TYPE AND NUMBER: HE 894082
DATE: 01/29/1923

LOCATION Township 13N, Range 5E, Section 7
PATENT TYPE AND NUMBER: IND TR PAT 926562
DATE: 12/14/1923

LOCATION Township 13N, Range 5E, Section 8
PATENT TYPE AND NUMBER: CE 130
DATE: 12/15/1879

LOCATION Township 13N, Range 5E, Section 8
PATENT TYPE AND NUMBER: HE 104
DATE: 01/09/1886

LOCATION Township 13N, Range 5E, Section 8
PATENT TYPE AND NUMBER: HE 546
DATE: 10/12/1900

LOCATION Township 13N, Range 5E, Section 9
PATENT TYPE AND NUMBER: HE 512
DATE: 11/24/1903

LOCATION Township 13N, Range 5E, Section 14
PATENT TYPE AND NUMBER: CE 687
DATE: 10/28/1902

LOCATION Township 13N, Range 5E, Section 16
PATENT TYPE AND NUMBER: CE 134
DATE: 12/15/1879

LOCATION Township 13N, Range 5E, Section 16
PATENT TYPE AND NUMBER: HE 160
DATE: 11/20/1882

LOCATION Township 13N, Range 5E, Section 17
PATENT TYPE AND NUMBER: HE 169
DATE: 06/24/1890

LOCATION Township 13N, Range 5E, Section 17
PATENT TYPE AND NUMBER: HE 19
DATE: 11/15/1881

LOCATION Township 13N, Range 5E, Section 21
PATENT TYPE AND NUMBER: CE 129
DATE: 12/15/1879

LOCATION Township 13N, Range 5E, Section 21
PATENT TYPE AND NUMBER: HE 114
DATE: 11/02/1891

LOCATION Township 13N, Range 5E, Section 21
PATENT TYPE AND NUMBER: HE 350305
DATE: 08/14/1913

LOCATION Township 13N, Range 5E, Section 21
PATENT TYPE AND NUMBER: HE 67
DATE: 01/09/1886

LOCATION Township 13N, Range 5E, Section 22
PATENT TYPE AND NUMBER: HE 887439
DATE: 11/13/1922

LOCATION Township 13N, Range 5E, Section 27
PATENT TYPE AND NUMBER: HE 478
DATE: 06/10/1898

LOCATION Township 13N, Range 5E, Section 27
PATENT TYPE AND NUMBER: HE 844648
DATE: 01/23/1922

LOCATION Township 13N, Range 5E, Section 34
PATENT TYPE AND NUMBER: CE 16
DATE: 02/27/1901

LOCATION Township 13N, Range 5E, Section 34
PATENT TYPE AND NUMBER: CE 329
DATE: 12/31/1890

LOCATION Township 14N, Range 4E, Section 2
PATENT TYPE AND NUMBER: CE 185
DATE: 07/27/1885

LOCATION Township 14N, Range 4E, Section 2
PATENT TYPE AND NUMBER: CE 238
DATE: 12/16/1889

LOCATION Township 14N, Range 4E, Section 3
PATENT TYPE AND NUMBER: CE 149
DATE: 12/05/1884

LOCATION Township 14N, Range 4E, Section 3
PATENT TYPE AND NUMBER: CE 157
DATE: 12/05/1884

LOCATION Township 14N, Range 4E, Section 3
PATENT TYPE AND NUMBER: CE 220
DATE: 12/16/1889

LOCATION Township 14N, Range 4E, Section 3
PATENT TYPE AND NUMBER: CE 237
DATE: 12/16/1889

LOCATION Township 14N, Range 4E, Section 3
PATENT TYPE AND NUMBER: HE 444
DATE: 11/10/1897

LOCATION Township 14N, Range 4E, Section 4
PATENT TYPE AND NUMBER: CE 543
DATE: 06/10/1896

LOCATION Township 14N, Range 4E, Section 4
PATENT TYPE AND NUMBER: HE 68
DATE: 12/30/1884

LOCATION Township 14N, Range 4E, Section 4
PATENT TYPE AND NUMBER: HE 88473
DATE: 11/08/1909

LOCATION Township 14N, Range 4E, Section 11
PATENT TYPE AND NUMBER: CE 144
DATE: 12/05/1884

LOCATION Township 14N, Range 4E, Section 11
PATENT TYPE AND NUMBER: HE 192
DATE: 08/23/1893

LOCATION Township 14N, Range 4E, Section 11
PATENT TYPE AND NUMBER: HE 363
DATE: 06/11/1895

LOCATION Township 14N, Range 4E, Section 13
PATENT TYPE AND NUMBER: CE 631
DATE: 08/14/1899

LOCATION Township 14N, Range 4E, Section 13
PATENT TYPE AND NUMBER: CE 657
DATE: 06/11/1900

LOCATION Township 14N, Range 4E, Section 13
PATENT TYPE AND NUMBER: HE 60
DATE: 09/03/1884

LOCATION Township 14N, Range 4E, Section 13
PATENT TYPE AND NUMBER: HE 803
DATE: 07/27/1904

LOCATION Township 14N, Range 4E, Section 14
PATENT TYPE AND NUMBER: CE 148
DATE: 12/05/1884

LOCATION Township 14N, Range 4E, Section 14
PATENT TYPE AND NUMBER: HE 716502
DATE: 11/03/1919

LOCATION Township 14N, Range 4E, Section 15
PATENT TYPE AND NUMBER: HE 791341
DATE: 01/21/1921

LOCATION Township 14N, Range 4E, Section 15
PATENT TYPE AND NUMBER: RRIS 813150
DATE: 06/30/1921

LOCATION Township 14N, Range 4E, Section 23
PATENT TYPE AND NUMBER: CE 646
DATE: 06/11/1900

LOCATION Township 14N, Range 4E, Section 24
PATENT TYPE AND NUMBER: CE 290917
DATE: 09/09/1912

LOCATION Township 14N, Range 4E, Section 24
PATENT TYPE AND NUMBER: CE 606
DATE: 11/11/1898

LOCATION Township 14N, Range 4E, Section 24
PATENT TYPE AND NUMBER: CE 628
DATE: 07/15/1899

LOCATION Township 14N, Range 4E, Section 24
PATENT TYPE AND NUMBER: CE 650
DATE: 06/11/1900

LOCATION Township 14N, Range 4E, Section 25
PATENT TYPE AND NUMBER: CE 661
DATE: 10/04/1900

LOCATION Township 14N, Range 4E, Section 25
PATENT TYPE AND NUMBER: CE 683
DATE: 08/12/1902

LOCATION Township 14N, Range 4E, Section 25
PATENT TYPE AND NUMBER: CE 684
DATE: 08/12/1902

LOCATION Township 15N, Range 3E, Section 1
PATENT TYPE AND NUMBER: HE 680819
DATE: 06/02/1919

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: CE 158
DATE: 07/27/1885

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: HE 187
DATE: 05/11/1894

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: HE 646
DATE: 02/12/1902

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: HE 78
DATE: 09/03/1884

LOCATION Township 15N, Range 4E, Section 7
PATENT TYPE AND NUMBER: HE 465357
DATE: 03/29/1915

LOCATION Township 15N, Range 4E, Section 17
PATENT TYPE AND NUMBER: HE 1097660
DATE: 06/17/1938

LOCATION Township 15N, Range 4E, Section 18
PATENT TYPE AND NUMBER: CE 439098
DATE: 10/29/1914

LOCATION Township 15N, Range 4E, Section 18
PATENT TYPE AND NUMBER: DLE 717758
DATE: 11/08/1919

LOCATION Township 15N, Range 4E, Section 18
PATENT TYPE AND NUMBER: HE 171435
DATE: 01/19/1911

LOCATION Township 15N, Range 4E, Section 18
PATENT TYPE AND NUMBER: HE 770091
DATE: 08/26/1920

LOCATION Township 15N, Range 4E, Section 19
PATENT TYPE AND NUMBER: HE 522538
DATE: 04/01/1916

LOCATION Township 15N, Range 4E, Section 20
PATENT TYPE AND NUMBER: HE 799033
DATE: 03/03/1921

LOCATION Township 15N, Range 4E, Section 20
PATENT TYPE AND NUMBER: HE 982184
DATE: 07/13/1926

LOCATION Township 15N, Range 4E, Section 33
PATENT TYPE AND NUMBER: HE 88173
DATE: 11/08/1909

LOCATION Township 15N, Range 4E, Section 35
PATENT TYPE AND NUMBER: RRIS 813150
DATE: 06/30/1921

LOCATION Township 16N, Range 3E, Section 8
PATENT TYPE AND NUMBER: CE 215
DATE: 12/16/1889

LOCATION Township 16N, Range 3E, Section 8
PATENT TYPE AND NUMBER: HE 220
DATE: 11/23/1891

LOCATION Township 16N, Range 3E, Section 8
PATENT TYPE AND NUMBER: HE 253
DATE: 02/23/1892

LOCATION Township 16N, Range 3E, Section 8
PATENT TYPE AND NUMBER: HE 539
DATE: 02/08/1900

LOCATION Township 16N, Range 3E, Section 9
PATENT TYPE AND NUMBER: HE 153
DATE: 02/24/1908

LOCATION Township 16N, Range 3E, Section 9
PATENT TYPE AND NUMBER: HE 666
DATE: 03/07/1902

LOCATION Township 16N, Range 3E, Section 16
PATENT TYPE AND NUMBER: State Grant
DATE: 12/27/1877

LOCATION Township 16N, Range 3E, Section 17
PATENT TYPE AND NUMBER: CE 330
DATE: 06/24/1895

LOCATION Township 16N, Range 3E, Section 20
PATENT TYPE AND NUMBER: FLS 264746
DATE: 05/09/1912

LOCATION Township 16N, Range 3E, Section 20
PATENT TYPE AND NUMBER: FLS 264746
DATE: 05/09/1912

LOCATION Township 16N, Range 3E, Section 20
PATENT TYPE AND NUMBER: HE 564
DATE: 06/28/1900

LOCATION Township 16N, Range 3E, Section 21
PATENT TYPE AND NUMBER: CE 665
DATE: 02/20/1901

LOCATION Township 16N, Range 3E, Section 21
PATENT TYPE AND NUMBER: HE 565
DATE: 10/12/1900

LOCATION Township 16N, Range 3E, Section 21
PATENT TYPE AND NUMBER: HE 717
DATE: 01/30/1906

LOCATION Township 16N, Range 3E, Section 26
PATENT TYPE AND NUMBER: CE 692
DATE: 07/18/1903

LOCATION Township 16N, Range 3E, Section 26
PATENT TYPE AND NUMBER: HE 166
DATE: 12/31/1890

LOCATION Township 16N, Range 3E, Section 27
PATENT TYPE AND NUMBER: CE 162
DATE: 12/05/1884

LOCATION Township 16N, Range 3E, Section 27
PATENT TYPE AND NUMBER: HE 1052701
DATE: 01/11/1932

LOCATION Township 16N, Range 3E, Section 27
PATENT TYPE AND NUMBER: HE 283
DATE: 12/09/1892

LOCATION Township 16N, Range 3E, Section 27
PATENT TYPE AND NUMBER: HE 405
DATE: 12/18/1896

LOCATION Township 16N, Range 3E, Section 27
PATENT TYPE AND NUMBER: HE 532826
DATE: 06/10/1916

LOCATION Township 16N, Range 3E, Section 28
PATENT TYPE AND NUMBER: CE 174
DATE: 11/20/1883

LOCATION Township 16N, Range 3E, Section 28
PATENT TYPE AND NUMBER: FLS 580415
DATE: 04/25/1917

LOCATION Township 16N, Range 3E, Section 28
PATENT TYPE AND NUMBER: HE 431987
DATE: 09/17/1914

LOCATION Township 16N, Range 3E, Section 28
PATENT TYPE AND NUMBER: HE 728034
DATE: 01/16/1920

LOCATION Township 16N, Range 3E, Section 30
PATENT TYPE AND NUMBER: IND RES X PAT 297309
DATE: 10/21/1912

LOCATION Township 16N, Range 3E, Section 35
PATENT TYPE AND NUMBER: HE 143
DATE: 08/19/1890

LOCATION Township 16N, Range 3E, Section 35
PATENT TYPE AND NUMBER: HE 155
DATE: 08/19/1890

LOCATION Township 16N, Range 3E, Section 35
PATENT TYPE AND NUMBER: HE 158
DATE: 08/19/1890

LOCATION Township 16N, Range 3E, Section 35
PATENT TYPE AND NUMBER: HE 228
DATE: 11/23/1891

LOCATION Township 16N, Range 3E, Section 35
PATENT TYPE AND NUMBER: HE 590591
DATE: 07/03/1917

LOCATION Township 17N, Range 1W, Section 1
PATENT TYPE AND NUMBER: CE 250
DATE: 08/08/1889

LOCATION Township 17N, Range 1W, Section 3
PATENT TYPE AND NUMBER: CE 318
DATE: 09/28/1894

LOCATION Township 17N, Range 1W, Section 4
PATENT TYPE AND NUMBER: HE 270566
DATE: 06/01/1912

LOCATION Township 17N, Range 1W, Section 5
PATENT TYPE AND NUMBER: In Lieu 58
DATE: 06/27/1922

LOCATION Township 17N, Range 1W, Section 6
PATENT TYPE AND NUMBER: In Lieu 65
DATE: 11/10/1922

LOCATION Township 17N, Range 1W, Section 7
PATENT TYPE AND NUMBER: HE 199
DATE: 11/02/1891

LOCATION Township 17N, Range 1W, Section 8
PATENT TYPE AND NUMBER: HE 198
DATE: 02/09/1891

LOCATION Township 17N, Range 1W, Section 9
PATENT TYPE AND NUMBER: HE 349
DATE: 02/23/1895

LOCATION Township 17N, Range 3E, Section 7
PATENT TYPE AND NUMBER: ME 335072
DATE: 05/20/1913

LOCATION Township 17N, Range 3E, Section 17
PATENT TYPE AND NUMBER: HE 737605
DATE: 03/01/1920

LOCATION Township 17N, Range 3E, Section 33
PATENT TYPE AND NUMBER: HE 793381
DATE: 02/03/1921

LOCATION Township 18N, Range 1E, Section 29
PATENT TYPE AND NUMBER: HE 444072
DATE: 11/21/1914

LOCATION Township 18N, Range 1W, Section 35
PATENT TYPE AND NUMBER: HE 850
DATE: 05/23/1906

LOCATION Township 18N, Range 1W, Section 36
PATENT TYPE AND NUMBER: CE 277
DATE: 12/16/1889

LOCATION Township 18N, Range 2E, Section 31
PATENT TYPE AND NUMBER: CE 26
DATE: 12/30/1905

LOCATION Township 18N, Range 2E, Section 31
PATENT TYPE AND NUMBER: CE 45039
DATE: 02/01/1909

LOCATION Township 18N, Range 2E, Section 31
PATENT TYPE AND NUMBER: HE 36
DATE: 04/01/1907

ARIZONA STATE PATENTS

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: 53564
DATE: 01/08/1996

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: 031 7323
DATE: 01/22/1988

LOCATION Township 15N, Range 3E, Section 12
PATENT TYPE AND NUMBER: N 6938
DATE: 07/20/1983

XII. APPENDIX D – RESUME OF DOUGLAS R. LITTLEFIELD

Douglas R. Littlefield, Ph.D.
Littlefield Historical Research
6207 Snake Road
Oakland, California 94611
Telephone: (510) 339-1017
Email: douglittlefield@aol.com

EDUCATION:

Ph.D. American history. University of California, Los Angeles, 1987. Dissertation: "Interstate Water Conflicts, Compromises, and Compacts: The Rio Grande, 1880-1938." Fields: history of California and the American West, water rights history, legal history, environmental history.

M.A. American history. University of Maryland, College Park, 1979. Master's thesis: "A History of the Potomac Company and Its Colonial Predecessors." Fields: business history, colonial history, early republic history, trans-Appalachian West history, British history.

B.A. English literature. Brown University, 1972.

CONSULTING AND EXPERT WITNESS EXPERIENCE:

2004 – Present: Research historian and consultant for City of Santa Maria, California (counsel: Best, Best & Krieger of Riverside, California). Providing historical research and documentation on the history of water rights of the U.S. Bureau of Reclamation's Santa Maria Project (California) for use in *Santa Maria Valley Water Conservation District v. City of Santa Maria, Southern California Water Company, City of Guadalupe, et al.*, Santa Clara County (California) Superior Court, Case No. CV 770214.

2004 – Present: Research historian and consultant for City of Pocatello, Idaho (counsel: Beeman & Associates of Boise, Idaho, and White & Jankowski of Denver, Colorado). Providing historical research and documentation on the history of Pocatello's water rights for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States;*

State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System, County of Twin Falls (Idaho) District Court, Case No. 39576.

2003 – Present: Research historian and consultant for U.S. Bureau of Reclamation (Mid-Pacific Region). Providing historical research and a report on the history of the water rights of the Friant Unit of the Bureau's Central Valley Project (California).

2002 Research historian and consultant for the Alameda County Water District. Provided historical research and a report on the history of the water rights of the District.

2001 – Present: Research historian and consultant for Paloma Investment Limited Partnership (counsel: Mesch, Clark & Rothschild of Tucson, Arizona). Providing historical research (and deposed) regarding whether the Gila River was navigable in 1912 when Arizona became a state for use in *Flood Control District of Maricopa County v. Paloma Investment Limited Partnership* and *Paloma Investment Limited Partnership v. Flood Control District of Maricopa County*, Maricopa County (Arizona) Superior Court, Case No. CV97-07081.

2000 – 2001: Research historian and consultant for Salt River Project, Arizona (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Provided extensive historical research and documentation on Zuni Indian water rights and land claims in Arizona and New Mexico for use in *In re the General Adjudication of All Rights to Use of Water in the Little Colorado River System and Source*, Apache County (Arizona) Superior Court, Case No. 6417.

2000 – 2001: Research historian and consultant for the Maryland Attorney General. Provided historical research and affidavit testimony on the 1785 "Mount Vernon" interstate compact between Maryland and Virginia for use in U.S. Supreme Court case of *Virginia v. Maryland*, No. 129 Original.

2000 Research historian and consultant for the Salt River Project, Arizona (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Provided historical research and documentation on water rights of the Gila River, Arizona, for use in *In Re: The General Adjudication of All Rights to Use Water in the Gila River System and Source*, Maricopa County (Arizona) Superior Court, Case No. W1-203.

1998 – 2000: Research historian and consultant for the Idaho Attorney General. Provided historical research and report on whether the Salmon River and selected tributaries were navigable in 1890 when Idaho became a state.

1998 – 1999: Research historian and consultant for the Idaho Coalition, a landowners' group (counsel: John K. Simpson of Rosholt, Robertson & Tucker of Boise, Idaho, and Shawn Del Ysura of J.R. Simplot Company of Boise, Idaho). Provided historical research, and affidavit testimony on the impacts of various dams in the Columbia River and Snake River watersheds on anadromous fish for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States; State of Idaho; and all unknown claimants to*

the use of water from the Snake River Drainage Basin Water System, County of Twin Falls (Idaho) District Court, Case No. 39576.

1998 – 2000: Research historian and consultant for Sacramento Municipal Utility District of California (counsel: Ronald Aronovsky of Alden, Aronovsky & Sax of San Francisco). Provided research on land site history for use in *Sacramento Municipal Utility District v. California Department of Transportation, Sacramento Housing and Redevelopment Agency, et al.*, Sacramento County (California) Superior Court, Case No. 96AS04149.

1997 – Present: Research historian and consultant for City of Las Cruces, New Mexico (counsel: Stein & Brockmann of Santa Fe, New Mexico). Providing historical research and report on the City's water rights for use in *State of New Mexico v. Elephant Butte Irrigation District*.

1997 – 2003: Research historian and consultant for Fort Hall Water Users' Association, Idaho (counsel: Richard Simms of Hailey, Idaho). Provided historical research and report the Association's water rights in relation to the Shoshone and Bannock Indian land cessions on the Fort Hall Indian Reservation in Idaho for use in *Fort Hall Water Users' Association, et al., v. United States of America*, U.S. Court of Federal Claims, Case No. 01-445L.

1997 – Present: Research historian and consultant for Kern Delta Water District. Providing historical research and report on Kern Delta's water rights for use in *North Kern Water Storage District v. Kern Delta Water District, et al.*, Tulare County (California) Superior Court, Case No. 96-172919. Testified in that case as an expert witness historian for ten days in the initial trial, which was remanded for additional testimony and evidence. Providing additional research and written reports on water rights for the remanded trial.

1996 – 1998: Research historian and consultant for Idaho Attorney General. Provided historical research and report on water rights in relation to the Deer Flat National Wildlife Refuge for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States; State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System*, County of Twin Falls (Idaho) District Court, Case No. 39576.

1995 – 1998: Research historian and consultant for U.S. Department of Justice. Provided historical documentation on the history of water rights on the Santa Margarita River at U.S. Marine Corps Base, Camp Pendleton, in southern California.

1995 – Present: Research historian and consultant for the Salt River Project (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Providing historical documentation and reports on whether the Salt, Gila, and Verde rivers were navigable in 1912 when Arizona became a state. Testified in 1997 and 1998 before the Arizona Navigable Stream Adjudication Commission regarding the navigability of the Salt, Verde, and Gila rivers. Testified on the same subject in 1998 and 1999 before the Arizona State Legislature.

1995 – 2001: Research historian and consultant for Nebraska Department of Water Resources (counsel: Stein & Brockmann of Santa Fe, New Mexico). Provided historical documentation and report on water rights and the history of *Nebraska v. Wyoming*, 325 U.S. 589 (1945), for use in U.S. Supreme Court case of *Nebraska v. Wyoming*, Original No. 108, regarding the apportionment of the waters of the North Platte River. Deposed in that case, but the case was settled before trial.

1993 – 1994: Research historian and consultant for Simms and Stein, attorneys specializing in water law in Santa Fe, New Mexico. Provided historical documentation and affidavit testimony on Arapaho and Shoshone land claims and cessions along the Wind River in Wyoming for use in *In Re: the General Adjudication of All Rights to Use Water in the Big Horn River System and All Other Sources, State of Wyoming.*

1991 – 2003: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture (counsel: Montgomery & Andrews of Santa Fe, New Mexico). Provided historical documentation and reports on water rights and history of apportionment of the Republican River and its tributaries among Kansas, Nebraska, and Colorado for use in U.S. Supreme Court case of *Kansas v. Nebraska and Colorado*, No. 126 Original, regarding the interstate apportionment of the Republican River.

1991 – 1993: Research historian and consultant for Nickel Enterprises (Bakersfield, California; counsel: Anthony Murray of Carlsmith, Ball, Wichman, Murray, Case, Mukai & Ichiki of Long Beach, California. Provided historical documentation and report on the navigability of the Kern River for use in *Nickel Enterprises v. State of California*, Kern County (California) Superior Court, Case No. 199557. Testified as an expert witness historian in this case for eleven days.

1989 – 1990: Research historian for Pacific Enterprises, Los Angeles, California. Directed historical research for and coauthored a corporate history of this southern California holding company entitled *The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989* (1990).

1988 – 1989: Research historian and consultant for Water Defense Association, Roswell, New Mexico (counsel: Simms & Stein of Santa Fe, New Mexico). Provided historical documentation of water rights claims along the Bonito, Hondo, and Ruidoso rivers in southeastern New Mexico for use in *State v. Lewis*, Chaves County (New Mexico), Case Nos. 20294 & 22600, Consolidated.

1986 – 1990: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture (counsel: Simms & Stein of Santa Fe, New Mexico). Provided historical documentation and report on water rights and interstate apportionment of the Arkansas River between Kansas and Colorado for use in U.S. Supreme Court case of *Kansas v. Colorado*, October Term 1985, Original No. 105, regarding the interstate apportionment of the Arkansas River. Testified as an expert witness historian for twelve days.

1986 – 1989: Research historian and consultant for Legal Counsel, State Engineer Office, State of New Mexico. Provided historical documentation and report on water rights in the Carlsbad Irrigation District in southeastern New Mexico for use in *State v. Lewis*, Chaves County (New Mexico) Case Nos. 20294 & 22600, Consolidated.

1986 – 1987: Historical consultant for *National Geographic Magazine*. Advised editors on June 1987 article, "George Washington's Patowmack Canal."

1984 – 1986: Research historian and consultant for Legal Counsel, State Engineer Office, State of New Mexico. Provided historical documentation and report on the history of water rights on the Rio Grande and interstate apportionment disputes between New Mexico and Texas for use in *El Paso v. Reynolds*, U.S. District Court, Civ. Case No. 80-730-HB.

OTHER PROFESSIONAL EXPERIENCE:

January 1992 – 1994: Member of Board of Editors of *Western Historical Quarterly*.

1991 – 1995: Lecturer, Department of History, California State University, Hayward. Taught a graduate seminar on environmental history and also taught survey courses on American history and California history.

1980 – 1984: Editorial Assistant, *Pacific Historical Review*. Edited scholarly articles and book reviews.

1979 – 1979: Lecturer, University of Maryland's University College off-campus program. Taught courses on the history of the American West and U.S. History surveys.

PUBLICATIONS:

Books:

The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989 (coauthor, 1990).

Articles:

"The History of the Rio Grande Compact of 1938," in Catherine T. Ortega Klett, ed., *44th Annual New Mexico Water Conference – Proceedings – The Rio Grande Compact: It's the Law* (Las Cruces: New Mexico Water Resources Research Institute, 2000).

"The Forensic Historian: Clio in Court," *Western Historical Quarterly* (1994).

"The Rio Grande Compact of 1929: A Truce in an Interstate River Apportionment War," *Pacific Historical Review* (1991).

"Eighteenth Century Plans to Clear the Potomac River: Technology, Expertise, and Labor in a Developing Nation," *Virginia Magazine of History and Biography* (1985).

"The Potomac Company: A Misadventure in Financing an Early American Internal Improvement Project," *Business History Review* (1984).

"Water Rights During the California Gold Rush: Conflicts over Economic Points of View," *Western Historical Quarterly* (1983).

"Maryland Sectionalism and the Development of the Potomac Route to the West, 1768-1826," *Maryland Historian* (1983).

Book Reviews:

Sarah S. Elkind, *Bay Cities and Water Politics: The Battle for Resources in Boston and Oakland* (Lawrence: University Press of Kansas, 1998), in *Environmental History* (2000).

David C. Frederick, *Rugged Justice: The Ninth Circuit Court of Appeals and the American West, 1891-1941* (Berkeley: University of California Press, 1994), in *Pacific Historical Review* (1995).

Daniel Tyler, *The Last Water Hole in the West: The Colorado - Big Thompson Project and the Northern Colorado Water Conservancy District* (Niwot, Colorado: University Press of Colorado, 1992), in *Montana: The Magazine of Western History* (1994).

Lloyd Burton, *American Indian Water Rights and the Limits of Law* (Lawrence: University Press of Kansas, 1991), in *Journal of the West* (1994).

Zachary A. Smith, ed., *Water and the Future of the Southwest* (Albuquerque: University of New Mexico Press, 1989), in *Western Historical Quarterly* (1991).

F. Lee Brown and Helen Ingram, *Water and Poverty in the Southwest* (Tucson: University of Arizona Press, 1987), in *The Public Historian* (1990).

David J. Eaton and Michael Andersen, *The State of the Rio Grande/Rio Bravo: A Study of Water Resource Issues Along the Texas/Mexico Border* (Tucson: University of Arizona Press, 1987), in *New Mexico Historical Review* (1988).

Pat Kelley, *River of Lost Dreams: Navigation on the Rio Grande* (Lincoln: University of Nebraska Press, 1986), in *Pacific Historical Review* (1988).

Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water* (New York: Viking Penguin, Inc., 1986), in *Environmental History Review* (1987).

Thomas F. Hahn, *The Chesapeake and Ohio Canal: Pathway to the Nation's Capitol* (Metuchen, N.J.: Scarecrow Press, Inc., 1984), in *Business History Review* (1987).

PROFESSIONAL AFFILIATIONS:

American Historical Association, American Society for Environmental History, California Committee for the Promotion of History, California Historical Society, National Council on Public History, Ninth Judicial Circuit Court Historical Society, Organization of American Historians, Western History Association, Western Council on Legal History.