

FARMLANDS HISTORY: PART ONE

WATER

CROPS

HUBBELL TRADING POST NATIONAL HISTORIC SITE/ARIZONA

PREPARED FOR:

Southwest Parks and Monuments Association
339 South Broad Street, P.O. Box 1562
Globe, Arizona 85501

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FOREWORD

This is a historical study of water and the development of irrigation at Hubbell Trading Post National Historic Site and on the crops raised there. Because my instructions emphasized water rights and how they evolved, I devote a large part of my attention in the pages that follow to John Lorenzo Hubbell and his times. I have tried to understand how occupation of the site evolved from business interest to land claim and from land claim to water right and ultimately how it all became part of a Navajo irrigation project. In a more restricted sense I have examined the farm itself with its water system, layout, crops, and transitions which have carried this study into the more recent past.

It is a remarkable informative story. Hubbell, the Indian trader, takes on a different perspective as he deals with political and natural forces to perfect his homestead. Once established, there is a static quality to his farm and its operation. Conditions changed quickly, but brought little in the way of new opportunities for the Hubbell farmlands or for the Ganado Irrigation Project. Farming continued, but with diminishing momentum. The same irrigation system was used, the same crops raised, but it produced smaller profits and made less sense in the lives of people.

In certain respects this study is tentative, not definitive. It is interpretive in many of the things it considers rather than specific and final. In some cases final answers will not be found. In others further study should lead to a fuller list of specific conclusions. In other respects this has been a piecemeal study where approaching it from the whole might well have been more efficient. Subsequent studies should

both focus on other phases of the farmlands experience and round out what can be known about water and crops as they are seen in perspective of the entire operation. The Hubbell farmlands historical study should be continued.

This has been a pleasant task for me. It has been a return to the deserts of northern Arizona and topics in which I am deeply interested. Many people have made the experience more pleasant and have contributed to any success it achieves. Superintendent Ed Gastellum and Chief Historian Melody Webb, along with many other generous people in the National Park Service did much to point me on the path of information and make progress enjoyable. Curators, librarians, and archivists at the University of Arizona Library, the Arizona Historical Society, the Arizona State Department of Archives and Libraries, and the New Mexico State Records Center and Archives have all been helpful. People in other regional archives and universities were equally kind as were individuals and offices at Sun City, Ganada, Window Rock, and Ft. Defiance. My own staff at the Western Historical Quarterly and the library staff at Utah State University, too, have been pleasant and good to help. Thanks also to the Southwest Parks and Monuments Association for giving me opportunity to make the study.

HUBBELL FARMLANDS - PART ONE

Introduction

CHAPTER I

A. J. L. Hubbell: The Man and the Times

Writing on April 6, 1912, from Phoenix, where he was on Republican Party business, Navajo trader John Lorenzo Hubbell lapsed into satisfied reflection. "The appropriation for the Ganado Reservoir has passed the House [Congress]," he informed his oldest son, Lorenzo, who was at a Keams Canyon trading post, which was part of a flourishing business Hubbell and his sons operated. In fatherly tones he continued that the reservoir appropriation was

sure to pass the Senate, so at last after many years, my dream has come true and under adverse circumstances and with an opposition that no one thought could be overcome. This will show you that through life that what you always want, if it is right, persist in it and you will accomplish anything you start to do but first be right, then go ahead.¹

In the same mood he also wrote his other son Roman, at his headquarters in Ganado, informing him that the House had passed a bill containing \$35,000 for the reservoir and that an additional \$30,000 needed to complete it "will be appropriated this Fall without doubt."²

John Lorenzo Hubbell could well entertain feelings of satisfaction in 1912. He was at the zenith of his career. In the years just past he had completed the imposing stone buildings that indelibly marked his trading post, perfected a homestead entry in the center of the Navajo Reservation,

and in a most remarkable individual achievement had diverted Pueblo Colorado Creek, the only perennial flow of water in a radius of 35 miles, to irrigate his homestead. Now he had accomplished the seemingly impossible by bringing the Ganado irrigation system to the point of an appropriation as a federal project in which he retained what proved to be the "best" right. As his letter to Lorenzo implied, much of his life had been devoted to this dream. Indeed, the entire achievement of this remarkable man's life may be seen in terms of the Ganado irrigation project.

The annals of the West are replete with men who gave their lives to water. But among them Hubbell comes near being unique. In the nearest thing to an autobiography, he portrayed himself in well-known western stereotypes.³ He was lawman, trader, politician, and success, but like the myth he and his writer drew from it was a postured, self-seeking and clumsy portrait by comparison to the real John Lorenzo Hubbell. Dictated shortly before his death, it was one-dimensional and flat, more the last hurrah of a failing figure than a description of the complex supple individual Hubbell had been.

In reality Hubbell mixed visions and careers to be many things. While he was good at each, he approached greatness in the way he handled them in concert. On the one hand he was businessman--an entrepreneur who manipulated resources, created markets, and established an empire of modest proportions. He was a consummate master, if indeed not the ultimate virtuoso, of the Navajo trade. At once servant, friend, community molder, diplomat, regulator, and exploiter, he plied his Navajo clients with such effect that his influence lingers still, giving a special character to Ganado, and rising now and again above the inroads of time to moderate the tensions that new awarenesses and new needs bring to the reservation.⁴ He was also

host and point of regional access to politicians, publishers, explorers, artists, and writers--VIPs all, pace setters for the country, people who conceived its policy, molded its moods, and pointed the direction the West would go. He himself was a creator of image, who through the setting and ambience of his home, the geniality of his hospitality, and the astuteness of his business methods helped create a taste for, and spread the fame of, the Painted Desert, snake dances, and for the Navajos that both sold their rugs and jewelry and attracted favorable attention to them.⁵

Finally, he was a keen practitioner of frontier politics. Perhaps not a Davy Crockett or a Sam Houston, he nevertheless managed and manipulated things at every level, from the Mormon-Gentile struggles in St. Johns to the battle of sheepmen and cowboys that shook Apache and Yavapi counties, to Arizona's long fight to become a state. But with the sense for the jugular vein that often characterizes politicians, he made national government the true target of his political acumen. That this was so was due in large part to the fact that his place was located on the Navajo Reservation. It was also related to matters of water rights and land as surely as it was to profits, Indian relations, and trading licenses.

In dealing with the national government he was at home at all levels. He carried top-flight officials and political figures. He spent repeated periods in Washington, D.C., where the Office of Indian Affairs and the Department of the Interior were well known to him. When opportunity presented itself, he quickly made league with lobby groups like the Indian Rights Association and stood in well with journalistic crusaders like Hamlin Garland, who in that era of muckraking so often portrayed businessmen, Indian traders among them, as robber barons, corrupt, and venal.⁶ He maintained amicable relations with Arizona officials, both

among congressional delegations and with governors and other state officials.

Perhaps most remarkable was his ability to survive interagency tensions of the army and the Department of the Interior and sidestep the myriad dangers of the reservation's tribal, Indian agency, and personality relationships. Men less versed and perhaps less lucky than Hubbell, yet in their own right his peers--like Lot Smith of the Mormon community at Tuba City and Richard Wetherill of Mesa Verde and Chaco Canyon fame--succumbed to Indians whose native hostility was emboldened by serious infighting among the various white factions and interests that functioned on the reservation.⁷ By sidestepping potential enemies he picked up a friend here and found a supporter there. Only once did he seriously overreach himself. This was at the time of his unsuccessful bid for the United States Senate in 1914, which is reputed to have strained his finances to the point he never really recovered and can surely be taken as the point where the tide of his affairs began to ebb.⁸

B. Objectives of This Study

This is an interpretive presentation of the man John Lorenzo Hubbell. His long struggle to secure his water rights and develop a dependable delivery system was an extension of the man and to be fully understood must be seen in light of what he was and the times in which he lived.

While the best and most perceptive thumbnail biographies are the product of long, careful study, I offer what admittedly may prove to be a premature assessment of the man as a preface to this particular report precisely because I do not have the full picture of what he did in terms

of water development and crop selection. The records I have found are limited. They give an incomplete picture, yet they do give a picture, and it is a useful picture. Because I cannot trace his every act in detail, I will undertake to present a narrative of what he did based in some part on assumptions about what he was. Because evidence is sometimes circumstantial, I will occasionally find it necessary to show the man doing what he would likely have done rather than what the record proves unequivocally he did do.

For a planning document from which the Park Service creates policy and interpretive plans, this kind of approach has the obvious shortcomings that go with the lack of technical detail. On the other hand, it will have the strength of seeing Hubbell from the perspective of his water rights and crops rather than from the perspective of his public image or as trader. This will tend to redress points of distorted emphasis and broaden the view the Park Service has of the Hubbell Trading Post. Perhaps more important, this approach is useful to me and to some degree the only one open. It has real merit as a preliminary work that provides a broad outline of events, points up the availability or lack of historical material, and allows the establishment of working hypotheses which may be tested and developed later.

Furthermore, as it has worked out, the phased approach to the Farmlands Study under which the questions of water and crops have been addressed has had significant drawbacks. Research time was limited and little idea was had about where records would take the researcher. Yet from its very nature, the study of water rights required that a wide variety of sources be examined. This was done. In many cases little

information was found and the superficial search which time allowed was sufficient. Other sources were surveyed but not exhausted. In the case of the Hubbell Papers at Tucson, which deal mainly with the trading business, it may safely be said that they contain no windfall or "easy fix" for water questions. On the other hand, more general insights can doubtlessly be dug from them, but will require a period of systematic search and analysis that cannot be accomplished in less than a month or two. They are much more promising as a source of information on how the farm ran and what lay behind it in way of values. Similarly it seems likely that the General Land Office records at the Bureau of Land Management in Phoenix and Soil Conservation records housed in that city may well yield odds and ends of information through extended research and that the State Department of Library and Archives will surely provide additional information. Finally, it would seem there may still be additional information locked away in forgotten corners somewhere at Window Rock and Ft. Defiance. Sufficient search will jar loose the tumblers of these locks. The remaining unexamined sources--the National Archives and Federal Records Centers--seem much more promising. Clues abound that should lead research to major blocks of evidence.

Consequently, the present study hopes to make a preliminary statement about John Lorenzo Hubbell and his water rights and the crops he planted on his farm. It will examine water claims and attempt to provide a more or less complete outline of water's development to about 1920. Land and land rights will be viewed as elements essential to water's acquisition. Perspective and cause and effect will be important to this discussion. After 1920 water and crops will be dealt with only briefly as part of a

mature business and a decaying irrigation system. John Lorenzo Hubbell will be seen as central. Fuller treatment of numerous questions remains to be done, including the role of the Hubbell sons and daughter-in-law and the progressive collapse of the farming operation, as well as the routines of farming and its physical culture.

CHAPTER II. Water Rights in Long-range Perspective

A. The Agreement of 1913

One of the major purposes of this study is to throw light on the matter of Hubbell's claim to the water he used and to identify documents and precedents that indicate when and how that claim was established. To this point in my research, evidence appears to be more firmly rooted in practice and accepted precedent than in legal documentation. The most direct documentation yet to come to my attention is a 1913 agreement between Hubbell and the Department of the Interior. It came late, some thirty-five years after he first settled at Ganado, and at least ten years after he began irrigating. But for all that, it is an imposing document in both what it says and what it implies. Its language is clear. Hubbell owned land surrounded by the Navajo Reservation and had "acquired . . . water rights under the laws of Arizona" and had "built a canal or water ditch" about 2 1/2 miles long, and had "irrigated said lands for several seasons." The agreement further spells out that in exchange for his water rights and irrigation works Hubbell was to receive "not to exceed four hundred acre feet of water in each year" or a "proportionate share, per acre from the water supply actually available." He was to share proportionately in maintenance and operation costs.¹

(See Appendix I)

Beyond this clear language the agreement implies that Hubbell had shown good evidence of his claims to the water he used. Also suggested is the strong likelihood that such evidence still exists. But for the

moment we are left without further legal documentation. Apache County records at St. Johns reflect only indirectly upon Hubbell's water claims. The usual points of information in state and federal offices at Phoenix also failed to yield specific filings. The early history of the Hubbell Trading Post itself also throws little direct light upon this question. Like many frontier developments, Hubbell's early activities are obscured by time. No personal diaries recording general activities and suggesting intentions and motives have been found. Furthermore, Hubbell had few institutional connections from which purpose and intent may be inferred. His voluminous business records are also largely devoid of this kind of data.

B. Historical Setting

One exception is the memory of Dorothy Smith Hubbell, his daughter-in-law, who first came to the Hubbell ranch in 1920 and who knew John Lorenzo well and came to understand every phase of the Hubbell Trading Post as one of its managers. When asked about the nineteenth-century years of Hubbell's operation, she acknowledges first that she has no memory of it, but states that over the years she gained the impression that Hubbell's farming activities extended to before the turn of the century and that indeed the possibility of farming was apparent to him when he settled there. Two oral statements suggest her feelings. One from 1969 reads:

Mr. Hubbell built the first dam up at the lake and also three miles of ditches and flumes. They had a very wet year and that washed out his dam and he went to Washington to see if he could persuade the government to build a larger dam to benefit the Indians too. He had spent some \$25,000 already. As a

result they did build a bigger dam and took over the ditches and flumes. . . . I think the first dam was built before the reservoir was extended. At least they had some sort of irrigation system early.²

I inquired twice about these questions, once in an interview with Mrs. Hubbell on August 16, 1983, and again in a telephone conversation on September 12. Her response on the latter occasion was:

I can't recall any specific conversation when I was told that the farm and the irrigation system had been in operation prior to 1900. But I believe it was. And, yes, it is my opinion that Mr. Hubbell intended to farm the land when he first got there. He loved the land and thought it would always be in the family and worked to develop and hold it. Even in his declining years it was hard for him to give it up. I wonder, even now, if he would fault me for giving it up although I did it as a tribute.³

There are general evidences that support Mrs. Hubbell's suppositions. First, and perhaps most important, is the fact that Hubbell did indeed homestead and develop both land and water. While after-the-fact development does not prove intent, it does suggest that he recognized it as a possibility.

Others, too, had recognized the locale's potential. With its lake and its perennial flow of water in Pueblo Colorado Creek, the site had been a watering hole and crossroads from time immemorial. Modern Zunis claim it marked the western bounds of their traditional territory, and Hopis claim it marks the eastern bounds of theirs. Spaniards, too, undoubtedly knew of it and passed that way. By the time of the Mexican War (1846) Navajos had penetrated that far west and perhaps beyond. They are said to have called it "Lok' aah Nitell or Wide Reeds" and to have referred to Ganado Mucho, chief of the Western Division of the Navajos, who headquartered there, as "Tátsohnií Hastiin or Mr. Big Water."⁴

Anglo-Americans began to pass that way by 1850. Among them were Colonel Washington's military detachment in 1849, Amielial Whipple's railroad reconnaissance in 1853, and Captain Edward Beale in 1855.⁵

In May 1858 Captain Joseph Ives of the Topographical Engineers followed what by then was a well-beaten trail into Pueblo Colorado Valley from the West. With him came self-appointed delegations of both Hopis and Navajos, all of whom knew the entire country between Oraibi and Ft. Defiance. The Valley's stream and lake as well as the "brilliant sheet of verdure" that lay along its bottoms were welcome relief indeed, after the "frightfully arid" country through which Ives had passed.⁶

C. Prospects after 1875

As we approach Hubbell's era, the Pueblo Colorado Valley lay about six miles south of the 1868 treaty line establishing the Navajo Reservation but was well within Navajo country. It was also within what was increasingly recognized as one of the great avenues across the West. Thus the prospects of the site may have seemed good indeed when Hubbell took over first Charles Crary's primitive little post at what since has become Ganado Reservoir about 1876 and two years later bought the more impressive establishment of William Leonard on the south bank of Pueblo Colorado Wash about 2 1/2 miles away. It was one of the few spots in the entire region that combined both a lake and flowing water. A well-established trail passed through it. A prosperous community of Navajos lived in the neighborhood. Prospects for trade and government contracts were good, and with railroads already abuilding throughout the West, stranger things could happen than for Pueblo Colorado Valley to become a whistle-stop.⁷

Certainly there was some prospect that what was happening at St. Johns could happen here. In 1870 an express carrier had first built a shack at a crossing of the Little Colorado River there. Others followed by 1873, including Mexican Americans and the Barth brothers, who claimed

land and water and set themselves up as the dominant influence over Mexican communities at St. Johns and at neighboring Concho. Apache County was created in the winter of 1878-1879 and Hubbell's St. Johns store became the only hostelry and eating place when St. Johns picked off the county seat. The Barths parlayed their land and water claims, which could have been no more than a squatter's right similar to the claim William Leonard sold Hubbell, into ultimate payments estimated at \$19,000 as the Mormons moved in.⁸ Near St. Johns, the father of Lena Rubi, whom Hubbell married in 1879, had built the first diversion dam on the Little Colorado in 1873 and in February of 1880 filed claim to the dam site, water, and a right-of-way on which the ditch ran.⁹

As store owner and member of the St. Johns junta that picked off the county seat and did battle with the Mormons, Hubbell could not but have been aware of the potentialities of Pueblo Colorado Valley.¹⁰ His connection with the two key locations in the valley, one at the reservoir site where water entered the valley and the other on the largest piece of arable ground, could hardly have been accidental. Taken together with the speculative spirit that characterized northern Arizona's first settlers, his connection with these two spots make impressive evidence indeed that he recognized water's value and that he was keenly aware of any "possessory" rights that might accrue from occupation.¹¹

Detracting from the argument that Hubbell was intent on settlement from the first are his connections with St. Johns. The town flourished as an Indian trading center for a few years, and Hubbell continued to operate his store there until 1887 when he took shares in the Mormon-controlled Arizona Cooperative Mercantile Institution in exchange for his buildings and stock.¹² He was sheriff of Apache County from 1882 to 1886,

a position his own account shows to have been taxing, if not confining, but the county's lawlessness during his incumbency and the quickness with which his successor Commodore Perry Owens brought it to an end suggests his attention may have been elsewhere.¹³ His partnerships, first with a Mr. Pillsbury and then C. N. Cotton, may well have kept him away from Ganado much of the time, notwithstanding historian Frank McNitt's assertion to the contrary.¹⁴ Family accounts and business records, too, indicate that at various times homes were maintained in St. Johns, Albuquerque, and Gallup.

D. Early Land Claims

Nevertheless, Hubbell himself is explicit. In 1876 he took up "160 acres of land which was then open to homestead."¹⁵ Since no survey had yet been made and land at Ganado was not open to entry, it is not clear what he meant by "open to homestead." One thing, however, does seem evident. Several people did establish claims in the vicinity of the reservation that were proven up on as homesteads. Some were at Cienega Amerilla, or present St. Michaels, which like Ganado was a few miles south of the 1868 treaty line. These settlers jobbed for the government, traded, and freighted and some married Navajo women. Some also farmed and a few, including Sam Day, Sr., Anson C. Damon, Caddy Stewart, and J. R. Wilkins, or their successors, are said to have proven up on their claims.¹⁶

E. Trading Ranches

That Hubbell was recognized as one of these whose interests extended

to something more than trading is suggested in several references to his place as a trading ranch. In 1881 the phrase was used by John Gregory Bourke to describe the trading post of George M. (Barney) Williams at Kin Lichee, a few miles up Pueblo Colorado Wash from Ganado. According to Bourke, Williams'

ranch is of the Arizona order of architecture,—a single-storied, long low building of 'jacal' or palisade, filled in with mud chinking, and roofed with a covering of earth and brush. He had surrounded himself with many of the creature comforts, not the least important of which were one hundred chickens. In this secluded spot away from the lines of ordinary travel, and almost cut off from communion with white men, Williams has built up for himself a thriving and lucrative wool trade with the Navajoes, over whom, in common with Keams and Leonard he wields great influence.¹⁷

Bourke also referred to Thomas V. Keam's establishment in Keam Canyon as a "trading ranch." In addition to "bales of wool and sheepskins . . . packed in every nook and cranny of the long low building . . . awaiting a favourable season for transportation," Bourke describes Keam's water supply and garden.¹⁸

Indian reformer Herbert Welsh, who reported a trip through Navajo country three years later, made frequent references to trading posts, including one run by Hubbell's brother Charles in a "great tent."¹⁹ By contrast Welsh describes J. L. Hubbell's place as a "trading ranch." As Welsh related, his party spent the night

at the ranch of Hubbell and Pillsbury, to whose kindness and hospitality we are much indebted. Lorenzo Hubbell is an elder brother of the Mr. Hubbell whose name occurs earlier in my report. He is engaged in a successful business as a trader with the Indians. We found him most courteous and agreeable, and possessing a clear and intelligent mind.²⁰

A similar reference is given by J. J. Mora, who gave Lorenzo Hubbell a water color painting of Keam's trading post dated 1906 and inscribed with

"To the Boss of the Ranch." Similarly, Richard F. Van Valkenburgh refers in a 1941 publication to the "Hubbell ranch and trading post" in a way that sets it apart.²¹

Certainly such passing references do not establish the existence of water rights and legal claims to land. When taken together, however, they do lend credence to the idea that from the first Hubbell saw both potential and utility in exercising such rights as "squatters claims" conveyed. If nothing more, he recognized that a "possessory right" might well have a market value in the eventuality the government crowded him from the site as Indian needs grew.²² Also clear was the fact that "improvements" had sale value in case of a private transaction and that they would validate the reality of his ownership at such time as he undertook to patent the land.

CHAPTER III. Acquiring the Land Base: 1880-1917

Whatever can be said about the nature of Hubbell's claim from the standpoint of equity or custom, it was on shaky grounds legally between 1880, when an executive order extended the south boundary of the reservation, and 1902, when Hubbell's land was excepted from the reservation. It is clear that the trading post was occupied constantly during this period, but if Hubbell or either of his early partners actually took out water, or fences and irrigated the homestead prior to 1900, I have found no written source that says it in so many words. Furthermore, no specific record establishes that any move was made to secure title to the land or claim water until 1889. From 1890, however, until 1917 when a second patent was issued, easily traceable evidence exists of Hubbell's prolonged campaign to clear up the vexed questions raised by his place's location on the reservation and to acquire clear title and rights.

Land is the issue that appears first in the public record, but Hubbell clearly coordinated his effort where land and water were concerned. If the battle to clear the land title was waged in the public agencies and Congress, the campaign to get water involved first heavy financial risk and then a great selling job. Both required consummate political acumen. This chapter will describe the process by which Hubbell acquired land title. The next chapter will draw attention to how land and water related to each other in the process of proving up.

A. The Partnership of Cotton and Hubbell

The first step toward a clear title was taken by Hubbell's partner C. N. Cotton in the summer of 1890.¹ It is not entirely clear why

Cotton's name was used or what prompted the move at that moment. However, a number of considerations have some bearing on these questions. This was midway in the era of the Hubbell-Cotton partnership. Not only was Cotton actually at the trading post much of the time, but it was often referred to as his place, not Hubbell's. Typical was an 1892 irrigation survey listing of the trading post simply as "Cotton's" on its maps as well as in its text.² Record books maintained by the firm were often, but not uniformly, titled in Cotton's name.³ In addition, the partnership traded under a license applied for and issued to Cotton.⁴

A number of external factors may also have led the partners to believe that if they were ever to establish claim to land and water they had better move quickly. Land generally was in a state of flux in northern Arizona. In the late 1880s settlers who had acquired squatter's claims more than a decade previously were still unable to establish title because much land was unsurveyed and technically closed to settlement. Furthermore, the Atlantic and Pacific Railroad land grants were still the object of confusion and controversy.⁵ It was only a year or so since the Pleasant Valley feud between cattle owners and sheepmen had ended and the giant Aztec Land and Cattle Company (the Hashknife) ran on a strip of land along the Little Colorado that butted on the south boundary of the reservation. Land jumpings were common and contests in and out of court frequent.⁶ Settlers were distressed and protested to Arizona and to land office officials and took steps to clear up titles clouded by railroad claims. Arizona's delegates to Congress made protests about the state of Arizona's federal lands a stock in trade. Special agent S. B. Bevins of the General Land Office toured Apache County taking depositions and studying the situation. Mormon settlers at Tuba City and along the Little Colorado

redoubled their efforts to secure legal title. Ultimately, surveys were made and in some cases land long occupied "repurchased" from the railroad, thus settling the matter.⁷

Closer to home for Hubbell were developments along the southern and western boundaries of the Navajo Reservation. Never inclined to let artificial lines limit them, Navajos in great numbers were driven by increasing population and growing herds to adjacent ranges where they clashed with whites and Hopis for water and grass. This was a serious problem to which agents referred again and again in reports to the Commissioner of Indian Affairs.⁸ The competition between the two tribes became keen by 1888, and army detachments were dispatched several times to bring roaming bands of Navajos back. Agents toured the reservation in quest for unused springs and talked optimistically of wells and pumps. As shall be considered at greater length elsewhere, Agent C. E. Vandever also responded to a national movement to survey and classify public lands by calling for a survey of water supply, arable land, and potential dam sites on the Navajo Reservation in 1890.⁹ The implications of this growing pressure on natural resources could not have been lost upon Hubbell, and the fact that he and Cotton launched a campaign to secure their land claims by at least 1889 was doubtlessly related.

B. Thomas V. Keam's Example

During these same years Hubbell's neighbor to the west, Thomas V. Keam, made a determined, but apparently unsuccessful, attempt to acquire title to his trading post at Keams Canyon. He settled there initially in 1875 "for purposes of farming . . . and raising stock." He developed his

claim as quickly as possible, and in 1881 he wrote a Prescott friend, "Governor Erville," to help him to enter a section of land under the newly passed Desert Land Act. Erville learned that Keam could not complete his title, "the land being unsurveyed." Keam did, however, "furnish a plat of the land to the Register" to be placed "on file . . . showing my intention."¹⁰ Repeated efforts thereafter failed, and Keam was apparently never issued a patent. With the aid of the Indian Rights Association, he shifted his tack in 1888, now promoting his place as a government school and asking \$18,500 for his improvements, which included several buildings and "Ditches, Iron pipes, Dams, Transplanted Trees" and more than two miles of stone walls and wire fences. His unquestioned interest in educating the Indians notwithstanding, Keam was deeply chagrined at the \$10,000 Congress appropriated for his improvements.¹¹

C. Campaign to Reverse the Executive Order of 1880: First Phase

Whatever prompted them, Hubbell and Cotton appealed to the Commissioner of Indian Affairs in August 1890 to have "Cotton's" homestead excepted from the executive order of 1880, which had extended the reservation to include their trading post. In view of the process that Keam had gone through before he took his problem to Washington, D.C., it seems certain that they took preliminary steps in Arizona. This done, Cotton wrote the Indian Office in Washington, D.C. The Commissioner of Indian Affairs immediately referred the matter to the Department of the Interior. From there it was sent to Ft. Defiance for investigation by agent C. E. Vandever a capable, hard-working advocate of the current policies of assimilation, education, and Christianization of Indians. On September 25, Vandever

returned a favorable recommendation along with the report that

Mr. Cotton had lived on his place now within the limits of said addition to the reservation since the spring of 1878; that he had thereon a trading post, with a large number of buildings, and the best store on the reservation; that . . . Mr. Cotton settled upon his place with the intention of making it his home two years before the reservation was extended over the land occupied by him.¹²

On December 10 the commissioner forwarded an opinion that the executive order was within legal rights and that it "made no exception from the withdrawal from sale and settlement of tracts settled upon or occupied" prior to 1880. The commissioner also indicated that since the land had been "unsurveyed" Cotton had "acquired no vested right to" it. Then in a qualifying note that was key to the federal government's position on this sort of question, he continued, that it was not "the policy of the Department" to recommend the appropriation of "lands occupied by settlers in good faith unless it was considered necessary for the wants of the Indians."¹³ Even in such cases, it was recommended that settlers be paid for improvements. He also indicated that there was a remedy for Cotton's dilemma. "Where lands to which private parties have acquired valid or even inchoate rights, have been included in an Indian reservation by executive order, such order may now be so modified as to except such lands from the operation thereof."¹⁴ The entire correspondence was then returned to the department with "a draft of an executive order modifying said order of January 6, 1880, with a recommendation that the same . . . be presented to the President for his signature."¹⁵

The department "conceded" that Mr. Cotton has acted in good faith, and that it is a great hardship to extend said reservation over the premises occupied by himself." It also held that because of the General

Allotment Act (the Dawes Act) of 1887, Cotton's "remedy must be given by congressional action." Then in the most significant element of this entire process, the Secretary of the Interior concluded that "to enable Mr. Cotton to secure relief by Congressional action you are hereby directed to reserve the land covered by his improvements and occupied by him . . . until further advised."¹⁶

On February 9, 1892, New Mexico's territorial delegate, Antonio Joseph, introduced House Bill 5565, in Cotton's behalf "For Relief of Actual Settlers on the Navajo Reservation." This bill was assigned to committee and was never heard from again. It is not clear why a New Mexico delegate introduced the bill or why it failed to attract support. Whatever else it accomplished, it apparently taught that future efforts should be supported by careful preparatory work. Indeed, one wonders if dissolving the partnership and assigning the Ganado place to the man with Arizona connections may have been a business decision aimed in part at securing the land.

D. After 1892

The record as now known shows no direct action until the end of the decade. It is clear that the Hubbell-Cotton squatter's claim had been dignified by official recognition and that for the moment the property was under no threat. It is probable the two partners were content to let their claim rest. If no more than meets the eye had been done in the way of improvements, they were still in the old Leonard buildings. It could have been good strategy to initiate the new period of building

that is said to have been underway by 1900 before pushing the matter further. It may also have been prudent to postpone further action until after the partnership was dissolved. Or again, the break in the drive to get the land may have been more apparent than real and that Hubbell was actually busy establishing the economic and social base to complete his drive.

E. The Politics of Success, 1899 - 1902

In time the drive was renewed, and between 1899 and 1902 the necessary action to exempt Hubbell's claim from the reservation was slowly worked through Congress. One of the initial steps was taken by Cotton, who on January 3, 1899, wrote with reference to "his claime." There followed on February 9 a communication addressed to the president by N. O. Murphy, Republican governor of Arizona, "in the interest of Mr. J. J. Hubbell, (sic) a resident of Ganado, Arizona."¹⁸ On March 9, S. M. Brosius, sometime congressman from Pennsylvania and sometime Indian Rights Association lobbyist whose services were engaged by Hubbell, also submitted a communication with affidavits supporting Hubbell's claim. Since it appeared that the Cotton and Hubbell claims were in conflict, the Indian commissioner contacted Lt.-Colonel Constant Williams, formerly acting Indian agent at the Navajo Agency, and G. W. Hayzlett, the current agent, requesting that they help clear up the issue and ascertain if there were other claimants. On April 11, Williams advised the commissioner that A. C. Damon "makes claim" to a tract of land he had occupied at Ft. Defiance (apparently Cienega Amerillo or St. Michaels) for "about thirty years" and that the "land at Ganado, Ariz., was occupied at the time the reservation was extended . . . by Mr. J. L. Hubbell, who had purchased the

improvements thereon a year or two before from a man named Williams, and that Hubbell afterwards sold all, or a part, to C. N. Cotton."¹⁹ In August of the same year, Constant Williams wrote "Dear Hubbell" a letter explaining that Brosius had approached him requesting that he write an affidavit in behalf of Hubbell. Williams answered that he had written in behalf of Cotton and that he could serve Hubbell better if Brosius would get the Indian commissioner to approach him for information, which he had apparently done. Williams ended his letter to Hubbell with the "hope that next winter may see you put in legal possession of the property or properly compensated for it."²⁰

The issue between Hubbell and Cotton was quickly resolved when Agent Hayzlett reported on June 29, 1899, that "the interests of Messrs. Cotton and Hubbell are identical." In support of this statement he enclosed a letter from Cotton indicating that "if Hubbell's claim is allowed it will be perfectly satisfactory to me."²¹ Hayzlett also confirmed Anson Damon's claim and indicated that he had heard of no other claims. A letter from Hayzlett on December 2, 1899, to D. B. Henderson, speaker of the house of representatives, appealed for his support in putting Hubbell's claim forward. It is apparent that Hubbell had not only secured the backing of Indian reformers like Brosius, but that the agent himself justified his claim as serving the Indians. Hayzlett explained

I herewith hand you a synopsis of a Bill which partly explains itself. The author of this case is one J. L. Hubbell who resides on this Navajo reservation, some thirty miles west of the agency, he was a resident and occupant of the Quarter section of land on which he still lives long before the Executive Order of January 1880, which order extended the reservation. . . . He started and occupied the place expecting to make a permanent home, has improved and expended considerable money on it, I should think in the neighborhood of \$10,000, and if an act can be passed that will secure to him a title

he will put more Improvements on it and thereby give the Indians in the part of the country a daily object lesson, in the way of farming and stock raising. As it is he keeps some hogs, cows and hundreds of chickens, and gives Employment to many Indians during the year, he does a great deal for the Indians and when they cannot reach the agent they go to him for advice and always receive from him that which is timely and good, he is of great help to the agent thereby helping the Government and the Indian, I have some correspondence on this subject with the Indian Office, but cannot say whether they will recommend the legislation or not, but am of the opinion they will as I think they understand the justice of it.

I do not ask this many personal grounds but as a matter of justice, and I do think it will be a benefit rather than an injury to the Indians, and I trust you will take pleasure in having some member introduce a bill, and that the relief sought may be obtained.²²

It is apparent from this letter and indeed the entire turn-of-the-century correspondence that Hubbell enjoyed the goodwill of people at the agency as well as of the reformers and that his image as friend of the Indian and supporter of the assimilationist policy then in vogue was widely accepted. Contributing to this just at this time and doubtlessly not unrelated to the favor in which he was held was his role in encouraging the establishment of a mission at Ganado. He was on good terms with the Catholic missionaries at St. Michaels, which had been established in the years just past, and is said to have investigated the possibility of bringing a Catholic mission to Ganado. Discouraged because of Ganado's proximity to St. Michaels, Hubbell had welcomed a group of Presbyterians who were touring the reservation in 1900 and, indeed, suggested the site where the Presbyterian mission was subsequently located. Hubbell had the first missionaries assigned to Ganado live at his home during the months that "his bill" was being worked through Congress in 1901 and 1902. It is clear Hubbell's efforts to develop his place and Ganado generally were regarded as a force for civilizing the Navajos and taken, by many, to be in their best interest.²³

As a consequence, Bill 4001 was introduced in the House of Representatives on December 13, 1899, by J. F. Wilson, Republican delegate from the Territory of Arizona. The bill's intent was to except "all lands claimed by actual settlers or persons to whom valid rights attach . . . from the operations" of the executive order of 1880. This act passed the House on March 5, 1900. The Senate also passed the Wilson bill but amended it, making the Navajo Reservation subject "to the mining laws of the United States," which led the President to veto the bill.²⁴ It was reintroduced on January 7, 1902, by Marcus Smith, who had replaced Wilson as Arizona's delegate, in identical language except the offensive amendment had been dropped. Responding to S. M. Brosius's strong urgings to broaden its base of support, a slightly modified version was introduced in the House by Smith in April and at the same time in the Senate by William Stewart of Nevada, chairman of the Senate Committee on Indian Affairs. With this kind of support, the bill had passed both houses by June 30 and was signed by the president on July 1. The next day Brosius forwarded a certified copy which, he assured Hubbell, "Local Land Offices" would "take due cognizance" of. Hubbell could thus "go right ahead even before the statute is printed" and file his homestead application. Brosius concluded by expressing his interest in visiting Ganado to "go over the ground and see what improvements you contemplate now that the bill is law, and you can secure title to lands."²⁵

This was another major milepost on Hubbell's path toward establishing an irrigated farm secure in both its land and water claims. He must have felt much the same satisfaction on learning the way to ultimate ownership had been cleared that he would later feel upon learning that the Department

of the Interior had taken over the reservoir project. (See page 1 , above.) On the other hand, much remained to be done and many a crisis yet lay ahead.

F. Homesteading

Brosius's enthusiastic haste to get Hubbell started on the homesteading process notwithstanding, it appears he could have done no more than file a letter of intent in 1902 because the area had not been surveyed. It is not known what was done to get the survey made, but a rule of thumb did exist that when three settlers per township petitioned for a survey, the surveyor general was authorized to proceed without cost to the settlers as funds became available.²⁶ It may be that Anson Damon and other St. Michaels settlers shared Hubbell's need for a survey, and it appears that survey work was needed on the reservation. Even so, things moved slowly, and it was not until 1906 that the survey was completed by Hubbell's neighbor and friend Sam Day, who in his colorful past has surveyed a railroad grade up Pike's Peak as well as much of the south boundary of the 1868 treaty reservation.²⁷ Thus it would seem that formal entry would not have been made until that time.

Proving up did not proceed smoothly even then. Various minor mistakes created some delay, and real trouble came when Hubbell failed, after all he had experienced in the way of dealing with federal agencies, to provide evidence certifying his occupancy of the place. As a result the register of the Phoenix land office wrote him a curt demand giving him sixty days to "furnish" the necessary proof or face cancellation of his entry "without further notice."²⁸ Hubbell quickly filed three depositions. These

turned the trick with the land office and today provide the core of what is known about the construction of his irrigation system between 1902 and 1908. (See Appendices II-IV.)

Finally in 1908 a patent was issued. For the moment all seemed well, but it soon became evident that serious problems in the Sam Day survey flawed Hubbell's title. To clear this up, a new survey was necessary. Correspondence in 1912 suggested that Hubbell himself might have to pay for this survey, but the notes of Frederick C. Miller who did the resurvey in September 1915 include data on other farming plots along the Pueblo Colorado suggesting that the Indian Service at least bore part of the cost.²⁹ The resurvey completed and duly filed, Hubbell was issued a new patent in 1917, which has apparently withstood the test of time.

CHAPTER IV. Water Rights: A Clouded Issue

A. Dating Hubbell's Water Rights

Throughout this study the question of water rights has been of primary importance. As indicated in Chapter II, the most satisfactory documentary evidence of Hubbell's claim to water rights is the 1913 agreement with the Department of the Interior. (See page 8 and Appendix I.) This agreement indicates that Hubbell had acquired "water rights under the laws of Arizona" and in its references to his canal system implies that his water rights were of, at least, several years standing. Given the role of the doctrines of prior appropriation and beneficial use which were fundamental to Arizona water law, it is easy to trace Hubbell's water claims to 1902. In that year, his as yet unsurveyed and unentered homestead was opened to the functioning of federal land acquisition procedures, enabling him to prove up on his land and to implement plans for an irrigation system. There is much evidence of Hubbell's developing irrigation system in the years after 1902, and the system itself became evidence that water rights existed. Perhaps the most precise and succinct documentary evidence that Hubbell had appropriated water and was putting it to beneficial use is found in depositions submitted to the Phoenix land office as proof that he had fulfilled the homestead requirements for occupancy and development. (See Appendices II-IV.) Because they spell out what was happening and indicate that water rights date to the first year of the century, extracts from two of these may be quoted. In April of 1908 Mathew Howell, of Long Beach, California, stated under

oath:

that he first visited said land about ten years ago, . . . that Mr. Hubbell has established an irrigating system upon said land and has thereby brought under cultivation about one hundred and forty acres of land, . . . that said irrigating system consists of a main irrigating ditch about two and one-half miles in length, terminating in a reservoir, through which all of said land is irrigated by means of laterals. This irrigation system has been gradually developed during the last five years.

At the same time, Paul Brizzard of Phoenix stated that Hubbell:

has constructed an irrigating ditch about two and one-half miles in length from Pueblo Colorado Creek to a reservoir covering about five acres, and that from this reservoir he has built laterals, by means of which he is able to irrigate every part of his farm, consisting of about one hundred and forty acres . . . said irrigating system must have cost about fifteen thousand dollars and that the levelling and planting of said farm must have cost about ten thousand dollars more; that said irrigating ditch is substantial and well built, being upon an average five feet wide at the bottom and about seven feet wide at the top.¹

From the foregoing it is clear that Hubbell had appropriated water and that he was beginning to put it to beneficial use. Taken together with the 1913 agreement, these statements give clear evidence of water rights extending to 1902.

Since specific documentation does not provide clear evidence of earlier water rights, one is tempted to write no more on the topic. Yet there is more to the history of Hubbell's water claims than one sees if one leaves the question at 1902 where specific documentation ceases. One treads dangerous grounds in considering the vague beginnings of rights in this kind of situation. In the first place it is the preserve of the law, and even law finds it difficult to give lasting firmness to the quagmires of water rights. But without undertaking a legal brief, one

can comment historically and perhaps throw light on the circumstances out of which Hubbell's water right emerged and one can certainly raise questions to be answered by fuller research. To get at these considerations, oral sources, questions of intent, negative evidence, and growing interest in water development may be used to guide our discussion.

B. Oral Sources

Oral history has the obvious disadvantage that memory is limited to the life span of living people. Furthermore, people are much more apt to remember things and events than they are abstractions like the acquisition of water rights. In keeping with this, oral history tends to bear on water rights only as remembered things and events reflect upon them. As noted in an earlier chapter, Dorothy S. Hubbell is of the impression that the Hubbell farming operation began prior to 1900 and that John Lorenzo had constructed an early version of the Ganado Reservoir to facilitate it.² (See page 9 .) Friday Kinlichinee, Howard Gorman, and Arthur Hubbard, all longtime residents of Ganado, were also interviewed as to their impressions about when the irrigation system was put in. Mr. Kinlichinee, an octogenarian who was a trusted Hubbell employee and who continues to work for the Park Service, was of the opinion that the entire operation--dam, reservoir, ditches, and land preparation--was the work of a single year of creation. More important here was the fact that he could remember it himself.³ Howard Gorman disclaimed any impression about when the irrigation system had been put in but was of the opinion that Theodore Roosevelt had been instrumental in getting the dam project accepted in Washington, D.C., which would seem to reflect local folk history and

in any event could not have been earlier than 1913.⁴

Arthur Hubbard, whose earliest memories extend to the World War I period, said, in effect, that his only gauge about how long the irrigation system had existed lay in the fact that as a small boy he had "killed yellow birds with a sling in cottonwoods that used to grow around the reservoir there," by which he referred to the small holding reservoir at the head of the Hubbell property. These trees have long since disappeared, according to his report, but at the time, seemed like big trees to him. Cottonwoods were not found elsewhere along the Pueblo Colorado; the trees around the holding reservoir were a favorite haunt because medicine men wanted the feathers and skins of the yellow birds.⁵

Reflecting indirectly on whatever light trees can throw on timing of development is Mrs. Hubbell's memory of hearing that a line of cottonwoods grew along the lane south of the trading post until sometime between when Hubbell's widowed daughter, Barbara Goodman, came there to live and when Dorothy Hubbell herself arrived in 1920. A Mr. Collins was farm foreman at the time and wanted the trees out. The more aesthetically inclined Mrs. Goodman objected, but he went ahead and removed them.⁶ True they may have been immature trees as certainly they would have been had they been planted after a lateral was run along the lane in connection with Hubbells post-1900 developments. On the other hand, they may possibly suggest an earlier ditch.

Taken together, these oral sources do little to suggest that irrigation was established before 1902. Nevertheless, Mrs. Hubbell's opinion ought not to be discounted, and the existence of well-grown trees in Mr. Hubbard's memory suggests that the issue ought not to be finally closed until all possible sources of information have been exhausted.

C. Of Intentions and Rights

It would appear that intent has some bearing upon when rights began to attach in Hubbell's case. From time to time in the long proceedings by which Hubbell's land was excepted from the reservation, his intention to homestead at Ganado was cited as relevant. Thomas Keam, too, put his intent to settle Keams Canyon forward as his best hope of getting title there. (See page 18 .) Even in 1930, a few months before his death, Hubbell was still declaring he had intended to homestead when he first went to Ganado.⁷ In a frontier situation where settlement ran ahead of surveys and land entry, occupation was the ultimate and accepted statement of intent.

Custom was similar with respect to water. The water notice books found in every arid county are a means of recording and dating intention. In addition, it would seem that intent to homestead carried with it an implied intent to claim water, either by prior appropriation and beneficial use or by purchase. If Hubbell intended to homestead in 1876 as he asserts in "Fifty Years an Indian Trader," it would seem that such an objective implied an intent to use water.^{7a} As noted previously, his early connection with the reservoir site and with the largest piece of arable ground in Ganado valley bears this out. (See page 12 .) Whatever his early intent, it is difficult to document that he sustained it by personal occupation between 1876 and 1890. Indeed, close examination suggests that he ultimately sold his entire claim to Cotton and that for many years he lived elsewhere.

In light of this, 1890 becomes a better date to attach such water rights to as may inhere in intent to homestead. Although Cotton was still connected with Hubbell's trading post in 1890 and there was a

break of several years between Cotton's early effort to get the land and Hubbell's later one. "occupation" with all that it implied about improvements and development continued during these years. When the record has been fully examined, it may well prove that water claims were filed during these years, but whether such evidence is found or not, it would seem that the successive official decisions and legislative enactments by which the Hubbell-Cotton land claim was progressively legitimated, recognized that intention to use water had taken on some of the attributes of a right by 1890 and perhaps before.

D. Negative Evidences.

Certain negative evidences also support the existence of early water claim. Put differently, the fact that no one ever seriously challenged Hubbell's development of his irrigation system suggests that his water rights were fortified by time. Indian agents, surveyors, and United States Geological Survey scientists came and went for years. Some saw prospects for an Indian irrigation project, but none appears to have questioned Hubbell's rights. An example is Special Agent Levi Chubbeck, who inspected Ganado Lake in 1903 and again in 1904. On the second visit Chubbeck reported finding Hubbell's system under construction and recommended that the Indian Service consider his offer to sell the ditch at cost, "reserving the right to have it carry enough water for his use."⁸ Totally lacking is any sense that Hubbell was appropriating what was not his, which is in its way, a recognition of an established right.

Ironically an even more telling consideration of this kind lies in a benchmark decision of the Supreme Court defining the existence of

unique Indian water rights. To understand how this applies it is necessary to recall that Hubbell's 1913 agreement with the Department of the Interior accepted without question that he owned land adjacent to the Navajo Reservation and that he had "acquired . . . water rights under the laws of Arizona" with which to irrigate that land.⁹ (See Appendix I.)

In 1908 the court held in the case of *Winters vs. United States* that on reservations Indian water rights existed without the workings of either prior appropriation or beneficial use "because of an implied reservation of water with and at the time of the reservation of the land sufficient for the irrigation thereof."¹⁰ Historian of western water rights, Norris Hundley, has elaborated:

This so-called "reserved" water right constitutes a special right that differs significantly from all other kinds of water rights. Unlike a riparian right, which resides only in owners of land bordering a stream, it can be invoked to divert a stream onto nonriparian lands. Unlike the doctrine of prior appropriation, . . . the reserved right exists whether or not Indians are actually using the water, and it continues unimpaired even if the Indians should subsequently cease their uses.¹¹

This clearly pertains to the Navajo Reservation. It may be argued that Hubbell and William Leonard before him had acquired inchoate or possessory water rights prior to the Executive Order of 1880 extending the reservation to include Ganado. But the Rio Pueblo Colorado drains in excess of 220 square miles, extending well within the 1868 treaty reservation, which would seem to make its waters subject to the Winters Doctrine, unless prior appropriations and beneficial use could be traced beyond that date, which of course they cannot.

By 1913 the Commissioner of Indian Affairs and the Secretary of the Interior and solicitors who advised them were well aware of the Winters

Doctrine. It had been a bitterly contested and widely publicized case upon which subsequent decisions had been based.¹² Moreover, the commissioner himself reported in 1913 that Indian rights rested upon it and announced the "urgent necessity for looking thoroughly into all conditions pertaining to water rights on the various reservations to protect the Indians against the loss of such rights."¹³ There can be no doubt that Hubbell's case was considered in light of the Winters ruling. This, of course, raises questions that are difficult to answer. It is possible that any adverse implications the Winters Doctrine held for Hubbell were ignored on the grounds offered in support of his land claims in 1899 that he would "give the Indians . . . a daily object lesson, in the way of farming."¹⁴ (See page 23 .) More likely, Department of the Interior solicitors thought he had a valid claim and that it would stand up in court. Although I have not yet found the substantiating evidence, he had rights "acquired . . . under the laws of Arizona."¹⁵ By 1913 his land rights, with whatever they implied about water rights, had been judged valid by three separate processes: first, the 1890 departmental action "reserving" his rights from any adverse action of the Indian Service; second, the congressional act of 1902 reversing the Executive Order of 1880 as far as Hubbell's property went; and third, the homesteading process through which he acquired title in part by performing irrigation development work. (See pages 21-27.) Furthermore, the departmental action of 1890 had rested on the "opinion" that he had previously acquired "valid . . . rights" meriting that his land be reserved "from the operation" of the executive order extending the reservation.¹⁶

It seems almost certain that the rulings and correspondence on which the 1913 agreement rested can be found in the National Archives.

Until such evidence can be produced or until the matter is otherwise settled, it will remain an unresolved issue with the justice of the Winters Doctrine on the one hand balanced by the equity of rights confirmed by successive official actions on the other.

E. Development as an Influence on Hubbell's Water Rights

A climate of development and promotion in which water became a critical issue for Hubbell existed in the decades before the turn of the century. Mormons had settled at Tuba City along both the San Juan and the Little Colorado, where they built reservoirs, miles of ditch, and had good farms. Others, too, located along the San Juan, and the interest of the Wetherills turned from archaeology to trade and ranching at Kayenta and Chaco Canyon, while even such Indian country oases as Keams Canyon and Cienega Amerillo were being claimed and developed. By 1890 water development and land speculation had become a contagion in southern Arizona, and even Apache County water took on new value as speculators filed a welter of overlapping claims on Zuni and Little Colorado rivers.¹⁷

A region-wide cycle of dry years accompanied the speculative land boom of the late 1880s, and speculation and land reform seemed briefly to find a common cause in 1888. Congress acted on a plan submitted by John Wesley Powell, sometime canyonlands explorer but now director of the United States Geological Survey, for an irrigation survey throughout the entire arid region. By year's end, money was appropriated, and in a measure that soon shook the entire West, all public lands were closed

to settlement and development. A select senate committee took to the road, holding hearings in virtually all the arid states. Powell put engineers in the field surveying sites for reservoirs and canal works and launching longterm hydrographic studies. Although a public outcry from Arizona and elsewhere soon forced the government to reopen the public domain to settlement, Powell's surveyors continued their work into the mid-1890s ultimately surveying and classifying much of its water and land resources.¹⁸

Of significance here is that interest in storage reservoirs became important in the desert west for the first time. Previously, diversion dams and use of what may be termed primary waters had occupied attention. Now unclaimed secondary waters, huge dams, and vast delivery systems became the order of the day as first private capital, then state and local public monies and after 1902 vast infusions of federal funds through the Bureau of Reclamation, undertook to redeem western deserts. A generation-long mania ensued that badly overreached itself. Hundreds of millions were spent, hundreds of thousands of settlers located on submarginal lands, and as the generation aged in the 1920s and 1930s a retreat ensued that was only less traumatic in the mountain deserts than in Oklahoma.¹⁹ Certainly John Lorenzo Hubbell was a product of that mania. His values and efforts were inspired by it. His dreams and claims grew from it, and the support others gave him makes sense when viewed in its climate.

F. Resources and Assimilation

Closer to home the flux of the turn-of-the-century decades

influenced water rights in various ways. Navajo country underwent an extended drouth beginning in the late 1880s. Sheep herds and ponies had multiplied all out of reason. Human population, too, soared, and Navajos who may have numbered as few as 8,000 in 1868 when they returned from Fort Sumner now numbered more than 15,000. Upwards of half foraged for their herds beyond the limits of the reservation. As drouth deepened, they competed with white ranchers who were driven onto the reservation by similar forces.²⁰

Hard pressed by settlers and civil authorities, the Indian Service sought to curtail the roaming Navajos in the short run and yet move them in the direction of assimilation with the white society at the same time. Specifically, they sought to advance irrigation so the Navajos could support themselves without running their livestock beyond the reservation, and at the same time they encouraged an increasing number of Indians to work off the reservation and to educate their children. Education and Christianization were pursued with a vigor that was sometimes ruthless. Kean had parlayed his claim into a government school by the mid-1880s, and in time a boarding school was established at Ft. Defiance and mission schools at Two Grey Hills, St. Michaels, and Ganado, among other places.²¹ Used to recruit reluctant pupils, the military from Ft. Wingate sometimes complained. For example, one officer wrote in 1892 that

the use of the military to compel separation from their families is the one great question with the Navajo, and although his stock and relations will die this winter of starvation, yet that is a small item compared to the taking of his children. This compulsory attendance of his children will send him on the warpath quicker than anything else. White people would not stand it, and they make a mistake if they think the Navajo has only animal affection for his young. There are milder ways of educating this tribe.²²

Among the assimilationists were Agent George W. Hayzlett, who had gone out of his way to advance Hubbell's land claim in the name of civilization, and his associate C. H. Lamar, superintendent of the boarding school at Ft. Defiance. (See page 23 .) Wrote Lamar in 1901:

Though the generous spirit and intention of the Government have been explained to them [the Navajos] many times, they do not properly appreciate the efforts made in their behalf. I think a larger percentage of the former year's pupils were returned this year than ever before, yet the feeling and disposition of camp Indians on the reservation toward schools and education work generally is not encouraging. This sentiment may be overcome in time, but just now the work is very trying. . . . The fact that there is very little on the reservation to induce white people to come among the Navaho is responsible for their being so largely "left alone in their glory." Being shut in "by the nature of the place," as it were, and coming in contact to a very limited extent with other peoples, it is not surprising that they cling tenaciously to the time-honored customs and superstitions of their race.²³

Also committed, as we shall presently see, to the development of irrigation, Hayzlett and his colleagues were sometimes willing to sacrifice Indian resources to education and assimilation. In 1901, for example, the Presbytery of Arizona applied through Hayzlett for "160 acres situated near Ganado on the Navaho reservation" but indicated its preference to wait until Hubbell's irrigation project took form before the "exact site" would be chosen. Hayzlett responded that it was not "advisable to ask for so much land" and forwarded the request to the Office of Indian Affairs, which demonstrated its willingness to traffic in the trade-off between assimilation and resources, when the acting commissioner instructed Hayzlett to "report just how much land can . . . be spared without detriment . . . to the Indians."²⁴ The mission was later assigned only thirty acres of farming land, but the suggestion is strong that the system worked to the interest of whites, including Hayzlett, Hubbell, and the Presbyterian mission.

G. Navajo Irrigation

Nevertheless, efforts were underway to develop water holes and irrigation systems. Although Indians had farmed in northern Arizona since time immemorial and American efforts to cultivate a little land at Ft. Defiance extended back to 1852, irrigation development appears not to have been initiated on the Navajo reservation until 1886-1887 when an appropriation of \$7,500 was devoted to it. That year fifteen springs were opened up, five dams constructed, and fourteen small reservoirs and nine ditches were built. With impossible optimism the agent estimated that "12,000 to 15,000 acres of tillable land" would be opened to irrigation and water supplied for 100,000 animals. To encourage irrigation, farm implements were also distributed, including twenty-six wagons and "nearly one hundred corn-cultivators," which the Indians "refused to take away" because they were "worthless to them in their method of farming."²⁵

The following year another \$3,000 was devoted to building a dam and "three ditches aggregating two miles in length."²⁶ The form of the future, however, was already apparent. Hastily designed and poorly built, the new water works proved to be as worthless as the cultivators, and successive agents scornfully reported their uselessness and their quick decay in the face of desert weather conditions.²⁷

H. The Lt. W. C. Brown Survey

With the drouth unabated and the Powell irrigation survey getting underway, the Commissioner of Indian Affairs recommended in March of

1890 that a similar survey be made of the Navajo reservation. It seemed that the reservation was to be subject to a thorough investigation and that major projects might grow out of it. But the wheels of the bureaucracy ground slowly, and by the fall of 1892 when the so-called Lt. W. C. Brown Survey was conducted its prospects were already considerably reduced. The survey itself was superficial and three detachments, each under the command of a lieutenant with engineering training, rode the reservation at a ten-to-twenty-miles-a-day rate. Lt. Brown worked the San Juan River section. Lt. Odon Gurovits surveyed the northwestern and central portions of the reservation and Lt. E. M. Suplee took the south and southwestern portions, including Ganado.²⁸ Using maps produced by earlier surveys of John Wesley Powell, they visited springs and water courses demarked by Powell and dubbed in others they heard about or discovered. In all, seventeen maps were published, which, like their report, generally were done in haste. (See Appendix VI.)

Nevertheless, Suplee's maps and recommendations for the development of Ganado Lake as an irrigation system are interesting from several standpoints. In the first place, he marks the trading post as Cotton's. Second, his report is brief but outlines a project and establishes beyond all question that Hubbell was not then using Ganado Lake as a reservoir and that it had never been used as part of an irrigation system. In part, his report reads:

Returning to Cotton's and inspecting the Arroya Colorado, which goes dry about a quarter of a mile below his store, I found three miles up stream a natural lake in which water remains the year around, this year being the only exception. Six thousand feet up the stream from the lake (see Gonado [sic] map) a brush-wood dam 200 feet long and 20 feet wide, of rough construction, merely to turn the course of the stream,

which flows 100 gallons per minute, [this was in September of a dry year] into an artificial channel 6 feet wide at the bottom, 8 feet wide at the top, is recommended. The excavation is in easy soil running the stream through a notch to the lake; 200 feet of the excavation will be 6 feet wide at the bottom, 14 feet at the top, and 15 feet deep; the total excavation being 7,121 cubic yards. The lower end of the lake should have an embankment 3,500 feet long, 30 feet thick at the base and 15 feet high, thrown up with scrapers from the bottom and sides, requiring 60,000 cubic yards of earth. The lake itself drains 8 square miles of land, and the freshets and constant running of the stream should give a lake ten feet deep covering 200 acres.

The irrigating ditch should have a race and head gate. The race should be made 2 feet by 2 feet by 200 feet, of boards from Government sawmill 20 miles distant. It should run from 150 feet inside of embankment to 20 feet outside, where the gate should be made to regulate the flow. The ditch is 5 miles long, 3 feet wide at the bottom, 5 feet wide at the top, and 3 feet deep, and will irrigate 1,000 acres or more, if water is sufficient. The ditch is in firm soil except for 1,000 feet at the head, where loose soil and boulders occur. It rained six days while I was at Cotton's and although the lake had been dry, it had 8 inches of water in it after the rain.²⁹

Although time has proven that Suplee was both right and wrong in his recommendations, his plans do represent a considerable forward step from the first fumbling irrigation projects of the Navajo agency. To the extent that the diversion dam still stands where he visualized it and the storage dam approximates his 3,500 feet in length, his grasp of how the system would work was sound. On the other hand, his projected westside canal and the "1,000 acres of fine land" it was supposed to irrigate badly misread prospects. Later efforts to build the westside canal failed because of the length of the ditch, poor soil, and the fact that under the operational reservoir the best water rights were on the south side of the Rio Pueblo Colorado.³⁰

Although everything about Suplee's report denies the possibility of Hubbell or Cotton having established water claims, the relationship of the Indian commissioner's recommendation in 1890 and the survey in 1892 to the initial effort of Hubbell and Cotton to have their land excepted from the Executive Order of 1880 is almost certainly one of cause and effect. Suplee and his detachment obviously camped at Cotton's during the six days they were exploring the locality. This suggests they were received with the hospitality typical to the place, but it also assures that the partners were fully apprised of the survey and its meaning.

I. The Hubbell Water Act of 1893

Another development emerges from this period suggesting even more strongly that Hubbell's mind was on water rights. He had been elected to the Territorial House of Representatives that same fall of 1892 and from January to April 1893 was active in his legislative role. From that session of the legislature issued two of Arizona's fundamental water laws. Previous water law was limited. Dating from 1864, the territory's bill of rights declared all "water capable" of navigation or irrigation "to be public property." A law of 1871 reiterated this declaration, and in a clause that indicated that storing or impounding water was largely beyond the capacity of early settlers, further specified that water was applicable "to the purposes of irrigation and mining" and "provided that the appropriator should post a notice at the point of diversion and file a copy of the notice with the county recorder."³¹ Finally in

1887, a law had been enacted declaring that riparian rights had no force in the territory.

One of the major objectives of the seventeenth legislature in which Hubbell sat was to improve upon this situation, and Hubbell made it his business to have an influence on the outcome. The more important of the two bills was Act 86, "Relating to the Appropriation of Water and the Construction and Maintenance of Reservoirs, Dams and Canals." This law clearly enunciated the doctrine of priority, spelling out the "first appropriating water . . . shall always have the better right." It then lays out the rules by which water may be appropriated and specifies "reasonable time" governing the "construction of dams, reservoirs and canals." Bill No. 20 was introduced and shepherded through the legislative process by Hubbell himself, clearly putting him at the forefront of the legislative water interests. This act's purpose was "To Encourage the Impounding and Storage of Water in the Territory of Arizona" and was undoubtedly as much an indication of Hubbell's interest in what became Ganado Reservoir as it was a statement of law.³² Hubbell himself could return to Ganado content that the legal apparatus was in place that would enable him to compete effectively with the Indian Service in developing the waters of the Pueblo Colorado. Whatever his interests in the 1870s, by 1892 Hubbell and his place were part of what people were then calling "The Irrigation Age." Water rights, dams, and ditches were now prominent in Hubble's mind.

CHAPTER V. Hubbell's Irrigation System

Whatever it had amounted to prior to 1900, Hubbell's irrigation system "gradually developed" between 1902 and 1908 into a form that fully merited the name "irrigation system" and which guided subsequent water development at Ganado. Sam Day, Sr., who was to conduct the government survey in 1906 was paid by Hubbell for surveying work during 1903 and corresponded with Hubbell about his ditches and farm thereafter.

(See page 26 .) It seems logical to conclude that his work included surveys and plans for the diversion dam, the ditch, the storage reservoir at the head of Hubbell's property, and the laterals that carried water to the fields, as well as layout for the fields themselves.¹

A. The Diversion Dam

Hubbell's diversion dam, like almost all the dams built on the reservation up to that time, was a low earthen affair.² (See Maps 1-4 and 12-13, Appendix V.) If it diverted water out of the south side of Pueblo Colorado Creek, as the agreement with the Department of the Interior indicates, it must have been at a point somewhat below the present diversion dam and perhaps as far downstream as where the later ditch coming from the government reservoir was flumed from the north to the south side of the gully through which the creek flowed. At the present diversion dam site the terrain is such as to deny the possibility of a south-side diversion ever having been built there. Downstream, erosion has washed a large gully quite likely eradicating earlier diversion sites

for a half mile or so to the south. Experience elsewhere in northern Arizona makes it seem certain that Hubbell's first attempts to dam the stream for diversion purposes washed out frequently and required successive changes and created erosion.³ This made each succeeding round of repairs more difficult and pointed up the need for a reservoir and diversion works that could be controlled.

B. The Hubbell Canal

The canal Hubbell built has been reported as being from two -and-one quarter to three miles in length. Coming out of the Pueblo Colorado Creek on the south, it ran the entire distance to the homestead on that side. This required skirting several hills, or intruding points, and made building several flumes to cross washes running into the Pueblo Colorado necessary. The first generation of flumes was supported by wooden truss work and made of lumber acquired from the agency saw mill.⁴ (See Map 1 and Plans 9 and 11, Appendix V.) In spite of being "substantial and well built" by the standards of the day, they were by modern standards fragile and subject to malfunction. They were also subject to a host of natural stresses, including shifting soil, erosion, and the rapid deterioration of the yellow pine from which they were made.

Although during much of the irrigating season there would seem to have been little need for a ditch of large capacity Hubbell built well, making his main canal "five feet wide at the bottom and about seven feet wide at the top"--dimensions that compare favorably with the canal as it now exists.⁵ Perhaps his intent was to take full advantage of

spring runoff, and perhaps he had some thought of the ditch's trading value in mind.

C. The Holding Reservoir

The holding reservoir covered about five acres then as it does now. Contemporary accounts refer to it as being the point where the Hubbell canal terminated. Herbert Gregory, a United States Geological Survey geologist who visited Ganado before 1909, wrote of Hubbell's "low earth dams," which inclines one to think that the storage reservoir was impounded by a much less imposing dike than now surrounds it.⁶ Water flowed in at the southeast corner, and presently there is a break at the southwest corner suggesting that at some time water may either have been let into the pond or taken back into the ditch at that point.⁷ A wier that was evidently in working shape when farming was discontinued in the 1960s is located about a third of the way from the northeast corner, where it controlled the flow of water from the reservoir into a head ditch. Remains of an older outlet a few paces to the west are also evident today, as is a watering trough of a size appropriate for sheep, suggesting that livestock held in the field immediately below the pond were sometimes watered from it.

While the holding reservoir was an essential part of Hubbell's irrigation system, it was more a short-term or supplementary unit designed to provide flexibility and efficiency in irrigating than for storage in the usual sense. Hubbell, like Lt. Suplee, had recognized the necessary

role of an enlarged Ganado Lake as a reservoir. (See page 41 .) The natural lake collected water from a small drainage northwest of the head of Ganado Valley and emptied into the creek through a low pass that spread some three-quarters of a mile between the hilly intrusion that formed the north shoulder of the Pueblo Colorado's canyon on the east and the hills to the west. Thus the lake's "throat" could be easily dammed and the reservoir thus created conveniently filled with water diverted from the larger drainage. Yet it avoided most of the hazards usually connected with efforts to frontally obstruct large drainages. (See Maps 1 and 2, Appendix V.) Whether Hubbell learned from unsuccessful attempts to impound water there or understood from the first that it was beyond his capacity, he was working to involve the government in the project at least as early as 1903 or 1904. In both of those years a special inspector for the Department of the Interior named Levi Chubbeck inspected Ganado Lake as a possible site for a government project. Chubbeck's 1904 report read in part:

The Ganado Reservoir Site. --. In my former report of the Navaho Reservation, I made mention of a reservoir site near Mr. Hubbell's trading post, at Ganado, and recommended that it be considered. In company with Superintendent Perry, I looked over the site on this trip, and am still impressed that it can be made to hold a large amount of flood water, this to be diverted from the Pueblo Colorado Creek, by means of a ditch.

Since my visit to Ganado a year ago, Mr. Hubbell, the Indian trader, who has a 160-acre homestead near the reservoir site, has made a reservoir and ditch leading from the creek, at considerable expense to himself. It has been proposed that the Hubbell ditch be used for conveying the water from the proposed Government reservoir to the Indian land to be irrigated. Mr. Hubbell offers to sell the ditch at what is cost to him, reserving the right to have it carry enough water for his use, or to lease it at an annual rental which will equal interest on the cost of the ditch.

I suggest that Superintendent Perry together with the engineer whom he employs give the Ganado Reservoir and the Hubbell ditch propositions careful consideration. If the

reservoir can be made available, there is a large amount of excellent land close at hand on which to locate Indians.⁸

Thus, Hubbell looked beyond his small holding reservoir. It appears never to have been intended to impound water except in a temporary and supplementary sense and should properly be viewed as part of his delivery system.

D. Clearing the Land and Building the Laterals

Nearly as demanding as the construction of the delivery system was the task of putting land in shape for irrigating. Part of Hubbell's homestead, and perhaps much of it, was covered with cedar and pinion trees. Friday Kinlichinee recalls it as a "forest" that was cleared during the course of a single season.⁹ With teams accustomed to working in multiple hookups available during lulls in the freighting business, Hubbell had the necessary horsepower. Some trees may conceivably have been used for wood, but most were doubtlessly burned on the ground or used for riprapping and fill to provide foundation and body for diversion dams.

About a mile of ditch was constructed on the farm in five laterals together with a head ditch connecting four of them to the holding reservoir. (See Map 17, Appendix V.) The laterals varied some in width and depth, but physical remains suggest that they were about two feet wide at the bottom and three at the top. Remnants of the head ditch indicate it was of similar size, suggesting that only one stream was used at a time from the holding reservoir. Elsewhere, additional streams could be taken from one of several headgates opening directly into Hubbell's system from the canal to be used either as independent streams or together with the stream from the reservoir to make a good head of water. An Indian Service map

of the Hubbell place in 1931 shows five such direct headgates, most of which are to be found now apparently in the same place and in some cases still showing evidence of early stone and concrete construction.¹⁰

In all, some 110 acres were actually under the ditch system in five different fields. What may be called the first field lay on the land now occupied by the Park Service trailer court. It consisted of thirteen acres and was watered by a lateral coming directly from the main canal. Second, was the sixteen-acre piece that lies east of the trading post and directly north of the holding pond. It was irrigated from a lateral that ran down its east side and in 1931 was apparently under the same fence as the thirteen-acre field, but was separated from it by the arroyo and with a distinct ditch system. This arrangement still exists except for fences that also divide them now. Across the lane and to the south and west of the trading post was an eighty-acre tract of land that I will call the big field. It was fenced as a unit but divided into fields by three laterals that ran from south to north and northwest. An examination on the ground in the summer of 1983 indicated that at some time or other all three of the big field laterals were served at least in part by the holding pond. The 1931 Indian Irrigation Service map shows that the western-most or last lateral was also served by the main canal and that a supplementary ditch ran 200 or 300 yards through neighboring Indian fields in an effort to maintain grade and bring a stream in directly from the south to water high ground at the homestead's far southwest corner. Evidence of this arrangement is still very much apparent. How successful this upper ditch was or when it was put in is not known, but one is inclined to think it was tried as an expedient after experience had shown the last lateral would not do its job otherwise. Several remaining gullies in the small

brush area at the southeast corner of the big field suggest washouts and adaptations over the years as the Hubbells sought to get water around the rough south end of their farm to water the westside of the big fields.

E. Terraces

The land in each of these fields was evidently laid out during the early period of construction in checks or terraces, signs of which are plainly visible now. This is borne out by Friday Kinlichinee's memory and Mrs. Hubbell's impression that the terraces were part of the original watering system as well as by photographs from about 1910 showing evidence of borders in the field south of the barn. In further support is the fact that in the turn-of-the-century years check irrigation was popular, particularly in the Southwest. Thus, it is possible, as Friday Kinlichinee thinks, that Hubbell brought the idea for it from New Mexico. He could also have learned of it from the irrigation books and government publications that are found in his library.¹¹ While furrow irrigation probably predominated in northern Arizona, Hubbell may also have deemed it prudent to go with checks because of his dependence on unskilled hired labor.

The check system required that a major earth-moving task be undertaken to level the ten-to twelve-yard-wide terraces. Each one dropped appropriately from top to bottom (generally east to west) but maintained grade between borders (generally south to north) and then dropped a foot or so to the next terrace, repeating the process on down the ditch. Once established, check irrigating was relatively simple, as water was let into

each terrace and ran on it until it was completely flooded. If the borders were not unnecessarily abrupt to complicate crossing, it made for smooth fields and easy management for hay and certain other crops.

On the other hand, it was not every outfit that was equipped technically and with horsepower to install a check system originally. Even granting that Hubbell, and Leonard before him, had chosen the land wisely to minimize leveling, the original installation was doubtlessly an immense job. Arthur Hubbard, who would not be old enough to remember the original leveling, does recall twelve-mule hookups on levels and fresnos at work as fields were replanted during his boyhood.¹² Big floats or drags are among the homemade implements still to be found in the junkyard south of the corrals. There is no reason to think, however, that these date beyond World War II.

In walking the land, especially in the field east of the store, one observes a phenomenon in these terraces that I believe leads Friday Kinlichinee to make a comment about the terraces being formed in a very shallow "V" extending from a trough in the middle to the elevated borders on either side. It appears that rather than being designed that way some terraces have been plowed with one-way moldboard or disc plows that threw the soil out towards the borders, leaving the dead furrow at the exact center of the terrace. Typically, dead furrows were turned at the center at one plowing and at the outside the next to maintain level land. The "veed" or "swaled" effect observed by Mr. Kinlichinee thus seems likely to be the product of poor plowing.

F. Concrete and Stone Headgates

Perhaps the most impressive physical remains of the entire system, including the government dam, are the concrete and stone headgates that turned water from the laterals into the checks. Located ten to twelve paces apart according to the width of the terraces, about 125 of these remain. Although they vary somewhat in size according to the lift required to get water onto the land, they are of a single design and construction. They also appear to have been built at the same time and are remarkably free of repair work. They are formed in a winged construction with outriders extending a foot or so above the top of the ditch bank and into the earth bank on an easy angle. A slot is poured into each for a board to make the actual dam. The masonry work is less refined than much of the stone work one sees throughout the West dating to the W. P. A. and C. C. C. days, but is well made and has obviously stood the stress of time.

Who the mason was is not known. A Navajo named Des Cheenii Nez did much Hubbell Trading Post masonry work during the 1930s.¹³ Among the skills agents reported Navajos had by 1900 was stone masonry, and it seems altogether probable that some Navajo craftsman did this work as well.¹⁴ One's respect for the work rests not only on the detail of the stone work itself but on the fact that each headgate is individually crafted. Each headgate varies according to its situation, some being of perhaps twice the height and bulk of others. On the west two laterals, the head gates open to both right and left to aid in watering stretches where the grading left something to be desired.

The stone headgates like the trading post and barn reflect Hubbell's flare for massive well-built construction. They give a stamp of quality to the entire irrigation system and make a statement about Hubbell's operation that in various ways doubtlessly impressed all who saw his place. If Hubbell's intent was to project a baronial image to the likes of Hamlin Garland, he could scarcely have chosen a better device.¹⁵ If he was interested in enhancing the trading value of his canal works to appeal to the government engineers who he hoped to interest in Ganado Reservoir, the headgates would have been persuasive indeed.¹⁶ And if he hoped, as some of his supporters suggested, to set an example from which Indians could learn, there was nothing jerrybuilt to encourage bad habits here. And finally the modern observer who knows the rickety tick of moldering remains that mark other defunct irrigation systems throughout the desert west is humbled at what these stone markers say about Hubbell's character and industry in much the same way that one is humbled by the prehistoric buildings at Chaco Canyon or Hovenweep.

G. Questions of Timing, Costs, and Work Force

Three questions remain, one relating to the headgates and the others to Hubbell's work force and to the entire system's cost. One would like to know what year the headgates were installed. The laterals, or at least the first of them, were in place by 1904. Were the masonry headgates installed at that time? Or was there a period of experimentation with dirt, wooden, or canvas headgates? My impression is that the latter is

true. It would be logical to think of a time of experimentation, trouble with washing, gopher and prairie dog holes and then as the work of constructing the entire system tapered off, the installation of the headgates in a costly but necessary attempt to make the system work.

With one or two notable exceptions, the record offers only inferences. The crops raised during these years included considerable rye, a drought-resistant grass and grain crop that was very popular in dry farm circles during the turn-of-the-century decades.¹⁷ While Hubbell's cultivation of rye may even suggest a period of dry farming before the irrigation system was put in, it says explicitly that everything was not properly watered during the first years. Certainly other problems contributed to erratic irrigation, but earthen headgates cutting the laterals every ten to twelve paces would certainly have been among the complicating factors.

Another possibility is that the headgates were put in at a much later date, after cheaper but efficient yellow pine gates began to rot away. Although I did not examine every headgate in detail, I did look at each one with some care. Nowhere did I see a scratched date or name as I did at the diversion dam indicating that the last time the lip on its overflow was raised was in 1959 and that H. Reid did the work. Yet a few bits of evidence bear on the question of when the headgates were built. Mrs. Hubbell remembers with certainty that the headgates were there in 1920 and that to her eye they appeared to have had long use. Friday Kinlichinee is also certain that they date to the same period as the rest of the system.¹⁸ On the lateral running north along the lane towards and around the corrals two large cottonwood trees grow, one out of the middle of headgate number four and one in the middle of the ditch between headgates 33 and 34.¹⁹ They are mature trees and can and should be

dated, but at present convey more than anything else a sense that it has been a long time indeed since the ditch was properly maintained. Apple trees, all but two of which are dead, mark the course of the head ditch and the second lateral in the big field. They were almost certainly planted before 1908. Chinese elms mark the course of the third or westernmost lateral in the big field. Stunted and prematurely aged by drouth, they hint that either the third lateral was not used until the 1920s and the 1930s when the Chinese elm was much in vogue in northern Arizona, or to my mind, more likely they signify a time when irrigating was renewed through the third lateral after a period of disuse of sufficient length to kill the fruit trees.

There is, however, one matter of record that leads me to believe that the headgates were installed in 1908 and 1909. In September of 1908 a bill of lading from Sam Day was entered in a Hubbell account book, indicating that Day had loaded out three wagons for Hubbell with cement.²⁰ Without having made an exhaustive search, I can also say that I saw no other transactions recorded in Hubbell's books involving cement, either buying it, selling it, or shipping it at other times during the early decades. In other respects, the timing seems right, as the foregoing discussion shows. Consequently I am tentatively convinced that the stone headgates do indeed date to the fall and winter of 1908-1909.

Moving to the second question, I have looked in vain for time sheets, credit entries, or other evidences of labor costs from which some idea can be had about what kind of labor force Hubbell employed on his irrigation works. Otherwise, he was employing both Mexican Americans and Navajos as well as Anglos as teamsters and general labor. Many transactions

indicate that Indian laborers were paid in store goods and that labor was entered against existing bills that Hubbell carried. Indian respondents are quick to insist that Indians would have comprised most of the work force and that they did the work on the government dam construction and improvements. Indeed, Arthur Hubbard drove truck when the dam was raised in 1936.²¹ Records also indicate that Indians did most of the actual farm work throughout the years and were the only farmers most of the time. From this it may be deduced that Indians did much of the construction work. The fact that Des Cheenii Nez did much stone work during the 1930s indicates that Indians probably built the headgates as well. (See page 56 .) The use of regular farm crews of eight or nine men and peak crews during haying and baling of sixteen to eighteen suggests that Hubbell may have mobilized a formidable crew indeed as he put in his ditches.

Two factors seem to relate. How much were they paid and how did he afford it? Labor generally was cheap. This was particularly true as it related to farming and livestock, with a dollar a day being a common wage and managerial pay going as high as \$60 to \$75 per month. Indians were doubtlessly paid less. The Hyde Expedition, for example, paid 50¢ per day at Chaco Canyon.²² Navajos who worked for the railroad received from \$1 to \$1.25 per day, and reference is occasionally made to 75¢ as a going reservation wage.²³ As late as 1940 the Hubbell Trading Post paid \$1.50 for Navajo farm labor and twice that for a man and a team and three times as much if he brought his own mowing machine.²⁴ Liberal though he was said to have been, Hubbell could not have paid more than \$1 per day during the construction period and probably paid less, possibly as little as the Hyde Expedition.

The large work force involved would nevertheless have been costly, and that an individual entrepreneur built the system at all was due to the fact that the wage scale was determined by reservation-farm standards and that Hubbell worked the labor costs into his business, enlarging sales and turning a profit even as he paid for work done on the ditch. Any question that this was part of the formula is dissipated by the fact that after long years of disuse Hubbell's trading post at the dam site was reopened in 1913 to serve and take advantage of the population that construction and operation of the reservoir focused there.²⁵

As William Adams explains about traders of the mid-twentieth century in his Shonto, Hubbell maximized longterm profits by exploiting all the elements of the situation.²⁶ It may be said to have been a form of vassalage which ably applied enabled an individual to establish an irrigation system comparable in scope to the cooperative efforts of the Mormons at Tuba City and Bluff and the full equal of any project effected to that time on the Navajo reservation, with the possible exception of one or two on the San Juan River where potential was much greater. With his Hispanic background, Hubbell came by the kind of relationship that existed between himself and "his Indians" naturally, and with a good deal of benevolence and mutual goodwill he was able to complete a very impressive project indeed.²⁷

There remains the question of cost. Because it was worked into his overall business, there is probably no way to determine the real cost of Hubbell's irrigating system, but some observations may be made that will enable us to get some sense of what he paid. At different times and for different purposes he estimated costs and value differently. In the

depositions made in support of his homestead application in 1907 it was estimated that the ditch had cost \$15,000 and the land preparation \$10,000.²⁸ Much later Dorothy Hubbell also presented these figures as her understanding of what the irrigation improvements had cost.²⁹ Similar figures were also used in dickering with the Department of the Interior as Hubbell exchanged his canal for a water right in the Indian Service system. In each case there was an obvious advantage to keeping the figure high.

Tax records for the first decades of the century, on the other hand, listed farm improvements at or below \$4,000.³⁰ Any inclination to minimize tax filings, notwithstanding, Hubbell listed his farm at a full 160 acres of irrigated land in pre-1908 tax forms. This figure was dropped progressively thereafter until he showed only 60 acres as irrigated after 1915. Three possibilities suggest themselves here. The first would be that experience showed that, weather conditions and other things considered, no more than an average of 60 acres could be irrigated. Consequently, that figure represented an accurate assessment. Second would be that the number of acres irrigated actually did work downward from an initial high. But close examination of the premises and maps establishes that only 110 acres could have been farmed and that it would have been from that high, not 160 acres, from which irrigated acreage progressed downward.³¹ Third is the possibility that there was a strategic advantage in the homestead process in listing the full 160 acres as irrigated ground in the years prior to 1908.

Whatever the merits of these observations, Hubbell left a third and private evaluation of his irrigating works that would seem to be more useful in determining cost of development than either of the above figures. In 1902 a ledger book was opened in which he entered general

inventories and in other ways tried to summarize his business over the next five years.³⁰ The first entry is undated but by other entries would seem to be January 1, 1902. Here "Property Account Ganado" is entered at \$12,000 but no differentiation is made as to buildings, stock, land, or improvements. On December 31, 1902, his inventory entry includes "Ganado and Cornfield Improvements and 160 acres of Land, \$15,400." This would seem to represent an outlay of at least \$3,400 on farm and water improvements during the year, but almost surely represents an even larger outlay because he now enters a separate account to stock and sundries. By January 1, 1905, his inventory summary enters in part:

Ganado Buildings	\$13,400.00
Farm Land & Improvements, 160 acres	6,000.00
Ditch Account	8,990.90

All other items brought his total to \$85,545.78. Of importance here is that the ditch account had come into being since the last entry two years before. The total real property had risen from \$15,400 to nearly twice that amount, or \$28,390. The following year's summary on January 1, 1906, is entered differently but is of equal interest:

Farm Account	\$10,893.53
Ditch Account	8,990.90
Buildings and Improvements at Ganado	15,260.00

With other items, these bring his total worth to \$106,019.50. While the change of nomenclature clouds understanding, cost and value as they relate to Hubbell's irrigation system and land preparation would appear to come to something more than \$15,000. Although not the \$25,000 of some estimates, it was nevertheless a substantial amount of money. Perhaps more important, it provided the foundation upon which the government's Ganado project grew.

CHAPTER VI. The Ganado Reservoir and the Decline of the Hubbell Farm,
1913-1960

A. Private Influence and Bureaucratic Know-how

From the foregoing it is apparent that the interest of the Indian Irrigation Service in Ganado Lake as a reservoir site developed concurrently with Hubbell's irrigation system. Hubbell was, of course, aware of this and doubtless cultivated it. From the time of Lt. Suplee's report in 1892 Ganado Lake was periodically studied. Special Inspector Levi Chubbeck studied it in 1903 and again in 1904, recommending not only that its development be considered but that the takeover of Hubbell's canal ought to be part of the formula. (See page 51 .) Others followed him, but for years the scope of the project was beyond them. Means, political as well as economic, could not be mustered.

Only the outlines of how they came together can be seen in the records now available. It is a story for which documentation almost certainly survives in the National Archives and one that when told in full will reveal much about Hubbell's farming operations as well as his water interests. To tell the story without the full record is less than satisfactory, but what is known makes it possible to offer a preliminary sketch of how the reservoir came into being and what the long-term results were.

By 1909 things began to fall into a shape that would allow the reservoir to be built. The Indian Irrigation Service had been organized, and the fumbling beginnings of inexperienced but optimistic agents had given way

to professionals with wide experience and dedication like Samuel Shoemaker, who in two different assignments spent more than a half decade developing several Navajo projects on the San Juan River. Another dedicated professional named H. F. Robinson, took over as chief engineer of the southwest office of the Indian Irrigation Service about that time and encouraged by geologist Herbert Gregory's support of the project drafted plans and made cost estimates.¹ In Hubbell, Robinson and his colleagues found both deep interest in the project and political influence that would enable them to get it through.

In 1909 Hubbell was approaching the zenith of his career. His sons were grown and had joined him as Indian traders. His business had taken on regional dimensions as Navajo blankets and silver crafts caught on. Nationally he had numerous connections. In addition he was a politician of local prominence and knew the ropes in Washington, D.C. Thus in joining league with Robinson and other advocates of the reservoir at Ft. Defiance a good team was formed. They had the machinery and Hubbell brought influence to bear. In this role he worked closely with Arizona's congressional delegation, which with the acquisition of statehood in 1912 grew to three members. In addition to correspondence with Carl Hayden and Henry Ashurst that carried on through the World War I years, he made frequent trips to Washington. It is not clear how many trips the Ganado project involved, but between July 1912 and January 1913 he was to be found in Washington on three separate occasions, once for several months.²

From his point of view two major problems had to be worked out. First was to get the project accepted by the Indian Service and the Department of the Interior and funded by Congress. Although a \$35,000

item was written into an appropriation bill in April 1912 and a promise made for an additional \$30,000 to complete the project before the year was out, things did not move smoothly or quickly. Appropriations on the order of \$8,000 to \$13,000 were extracted from the Indian commissioner on several occasions. To complete the dam, upgrade flumes, and open the northside ditch, Hubbell turned again and again to Hayden and Ashurst, who were usually successful in keeping the project alive, if not in getting all it needed. By 1921 a total of \$107,581 had been expended on construction and \$18,427 on maintenance.³

Hubbell's second problem had to do with working out how his interests in the project would be maintained. Apparently this was accomplished during fall and winter visits in 1912 and 1913 as the agreement with the Department of the Interior was formally entered into on February 6, 1913, although Hubbell did not sign it until May 31. It is interesting to note that the 1913 agreement follows exactly the proposal first submitted by Special Inspector Chubbeck after his 1904 visit to Ganado. By the agreement's terms Hubbell turned over his water right and his diversion dam and canal. He received a water right in the project. (See page 8 and Appendix I.)

B. The Role of Teddy Roosevelt

In Ganado it is thought that Theodore Roosevelt played some role in pushing the reservoir project through Washington's red tape. There can be no question that Roosevelt made a trip to northern Arizona in 1913. Furthermore, Hubbell had established a connection with him as early as

1904 and from 1911 to 1915 corresponded frequently with members of his family.⁴ But there is no correspondence that has any bearing whatever on the reservoir, although the campaign to get it underway was obviously carried out simultaneously with the Roosevelt correspondence.

In the memory of people, however, Roosevelt and the reservoir are connected. This is particularly true among Navajos who have lived in the vicinity for decades. Howard Gorman, a one-time tribal councilman, for example, is clear in his memory. While Roosevelt was in northern Arizona to visit the snake dances and Rainbow Bridge, Hubbell is said to have ridden with him as they approached the trading post to a point overlooking Ganado Lake and told him of his dream to build a reservoir there. Roosevelt immediately recognized the merits of the proposal and got it for him in Washington.⁵ It is not clear that Teddy himself ever visited Ganado. Furthermore, by 1913 Roosevelt was an ex-president who had fallen out with his hand-chosen successor, Robert Taft, and had witnessed the election of Democrat Woodrow Wilson as president. It seems unlikely that Roosevelt had anything to do with the reservoir project. On the other hand, the story, with what it implies about the use of political influence, reflects a truism.

C. The Reservoir: Building and Farming

Once money was available, the Indian Irrigation Service wasted no time. Using Indian labor, horsepower, and fresno scrapers a 3,500-foot earthen dam was erected and diversion works installed to bring the water out of the Pueblo Colorado. Hubbell opened a trading post at the dam

site again, apparently in an effort to attract an Indian community to the upper end of the valley from which the labor force could be recruited and, of course, to take advantage of the money the project would crank into the area. By fall 1913 Herbert Gregory could report with gratification and some exaggeration that the project was nearing completion.⁵

On completion, the dam impounded water covering at high level about 350 acres and had a storage capacity of some 3,800 acre feet, which according to the accepted rule of thumb of two and a half acre feet per acre of land was to irrigate more than 1,700 acres.⁶ The first phase of the project developed only the canal south of the Rio Pueblo Colorado, although to bring water out of the reservoir it was necessary to run the canal some distance on the north and cross a creek bed to the south. Extensions requested in 1916 aimed at raising the dam, improving faulty flumes, and building a westside canal. Thereafter development proceeded slowly until perhaps as late as the 1940s, as the dam was raised, new flumes installed, and efforts made to push the westside canal several miles to the south. (See Appendix IV.)

It apparently took until 1921 to actually get Indian farmers on the land under the system. That year Agent Peter Paquette, assigned land and Indians, began to farm. As A. F. Robinson described it, Paquette began "alotting" land in January

and was besieged with requests from the Indians for allotments. Allottees at once commenced preparing their twenty acre plots and in a few instances building fences. By the middle of May we were delivering water to seventeen users, sixteen are under the south side ditch and one under the north side. A number of Indians who have plots under the north side ditch asked for water but we were unable to deliver water to them.⁷

In 1921 the Indians occupied 220 acres of land under the system, while Hubbell irrigated 100 and the Presbyterian mission between 20 and 30 acres.⁸ Most Navajo farms were located along the south side of the wash from the David T. Hubbard farm just below the dam to farms a mile or so below the Hubbell homestead.⁹ The reservoir was supervised by a "gate tender" for whom a home was constructed near the diversion dam. The role of gate tender was comparable to water boss on cooperative ditches elsewhere in the West. They managed the wier at the dam, kept the ditch functioning, and assigned water turns. In addition they advised Indians on farming methods and seeds and otherwise encouraged them. Several "gate tenders" are remembered with fondness by Navajos who spent their childhood on these farms. Among them was S. G. Maus, Mr. Maus, or Dr. Maus as he was sometimes called. A portly man, he wore bib overalls and like other gate-tenders was not well educated, but understood farming and irrigating. Eben Taylor was another who is remembered, as is Fred Mortensen.¹⁰ Most Indians followed Hubbell's lead and put their land into checks or terraces for irrigating purposes. David Hubbard, however, had been introduced to row cropping or furrows in his experience at Grand Junction as a youth and broke with the norm on his farm.¹¹

Although numbers probably never exceeded twenty-five families, the 1920s were the heyday of Ganado farmers. As oldtimers now recall, they raised flourishing crops of hay and vegetables. A Ganado Valley Grower's Association was organized, fairs were held at the mission, and for a time the project seemed to prosper in a limited way.¹²

But as elsewhere in northern Arizona, the lot of the irrigator at Ganado was not easy. Hubbell approached Henry Ashurst and Carl Hayden again and again for help in securing appropriations to make unanticipated

changes and repairs.¹³ In practice the project never irrigated more than 350 acres. Extensions planned in 1916 raised the dam and began to push a canal out on the north side. Construction proved to be unexpectedly difficult and land conditions disappointing on the 1,000-acre tract that since Lt. Suplee's first survey had been the prize that had attracted government planners. As one sobering letter to the commissioner in December 1922 put it: "The north side canal contains a great deal of adobe and is badly cut up by arroyos, and if leveled and graded would take an enormous amount of work to put in tillable conditions. I believe that the Indians would be unable to irrigate and farm this land successfully."¹⁴ Cornfields now became the objective. It was level and had good soil. With the canal expected to be put through, the area was subdivided into ten-acre plots and assigned to Indian families. The dam was raised, perhaps as many as three times and perhaps only once. Additional money was spent on the northside canal, but evidently water was never conveyed through it to the cornfield lands. According to one local source, only one farm was ever cultivated on that entire side.¹⁵ Visual examination would suggest the record may have been a little better. But changing times diverted attention just as experience raised questions about the project's prospects.

D. Collapse of Farming

An array of natural problems confronted the reservoir's developers. Spring runoff that had been counted on to fill the reservoir often proved to be so filled with debris and sediment that it was necessary to turn it downstream to avoid filling the reservoir with mud. Flumes failed

with regularity. And even in a dry country, floods were a menace. Ordinary rainy seasons filled the canal and threatened flumes. A series of storms in 1923 hurled challenges almost too great to meet. As Supervising Engineer H. F. Robinson recounted later that year:

On July 7, there was a cloudburst on the project extending from the reservoir to the mission, a distance of about three miles. 6 1/3 inches of water fell in 1 1/3 hours. . . . On July 14th another heavy storm when 4 inches fell in less than 2 hours, covering the entire project. . . . On August 18th another very heavy storm . . . September 17 another heavy rain for 42 hours. ¹⁶

Between them, the four storms very nearly leveled the entire delivery system. In addition, the course of the Rio Pueblo Colorado was badly eroded, complicating ditch and flume maintenance for all time.

With such difficulties, the prospects of the Ganado irrigation project remained modest. Instead of 1,500 acres under irrigation, about 330 were watered. Instead of Hubbell's 110 acres representing about 13 percent of the land, it turned out to be one third of the total, and in practical application over the years it seems possible that even a larger portion of the water may have been delivered to his land. Indeed there is a persistent account in the folk history of the valley that the Hubbell place may have got as much as two thirds of the water in normal years. ¹⁷

As early as the 1920s some observers had begun to sense that the project gave the Indians little access to their rights. The agent at Ft. Defiance was apologetic that the project was not producing better results in terms of Navajos served. He wondered if more had not been lost in the way of native farming at Cornfields than had been gained at Ganado. "When I located the Day School at the Cornfields," he wrote the commissioner in 1922,

there were many families living in that locality who were doing a great deal of farming, before the Ganado Reservoir was built and were raising good crops by irrigating their fields from the water that they took out of the wash. Since the reservoir has been built they have been unable to do any farming to speak of on account of their not being able to get water at the proper time, it being turned into the reservoir. Practically all of these Indians became discouraged and abandoned their land and moved away to some other place where they could do dry farming. I asked several Indians why they did not continue their farming around the Cornfields as they used to do and their answers were that they were unable to get water on their crops at the proper time and that they were a failure, but before the reservoir was built they were able to get water to raise good crops.¹⁸

This account raises numerous unanswered questions. It is not even certain that Hubbell himself was able to water regularly and adequately. It would seem evident, however, that Hubbell's claims to the project were met as fully as the conditions permitted.

But as elsewhere in the desert West, even the best water right at Ganado proved in the long run to be inadequate. By using water from the reservoir, the Hubbell homestead was farmed through the remaining years of John Lorenzo's life and quite possibly in diminishing acreage through the lives of his sons. After younger son Roman died in 1957, his wife, Dorothy Hubbell continued to farm until 1963 or 1964. Actually a recession that was slow and general had been underway for decades. From a high in the late 1920s and early 1930s, Navajo farming progressively failed as water problems, weeds, soil exhaustion, and lack of markets took their toll. The Depression and World War II brought other opportunities and different visions for the Navajos. By a process of attrition, farming slowly failed with the final stroke falling in the 1960s when the wier became inoperable at the reservoir, making any further water delivery impossible.

Farming at the Hubbell homestead suffered the same slow attrition. Hubbell died in 1930 and with him passed the vision of a "redeemed" west transformed from deserts to smiling farms. This vision had carried Hubbell beyond the narrow limits of the Ganado farm. Indeed, by 1920 he had a farm at Pinyon Spring near Zuni, one at the Vander Wagon ranch in the same vicinity, and two fruit farms at Farmington. The products of all went into the sales of Hubbell's trading posts, which by that time numbered perhaps a dozen stores and blanketed the Navajo reservation.¹⁹

Just as he had the entire system in place, the formula on which his farming success rested began to come apart. Mechanization replaced horses and mules with trucks. Although hay still sold on the reservation and from time to time large amounts of hay were trucked in from the Salt River Valley, the need to feed his own string of work stock that had made the farm such an integral part of his operation progressively declined. Similarly, New Deal grazing reforms ended the "open range" quality of the Navajo sheep trade making a farm less necessary. In addition, the same problems that beset his Navajo neighbors beset him. The submarginal character of his farm and the isolation of its location contributed to its decline as it did theirs. The quality of timelessness so apparent in the aging headgates and the bordered terraces also hint that there were few changes to make, little reason to update, gear for new markets, or change outmoded methods that belonged to a different era. Even with alfalfa hay the dominant crop, the soil wore out in time. The stables full of horses to provide manure passed by the board. Bind weeds took many of the fields, and creeping drought edged in the perimeters of others. Finally, minimum wages and labor discord among farm laborers and

and other opportunities heralded the passing of the cheap labor by which the irrigation system had been built and on which the farm had existed. It was John Lorenzo Hubbell's dream, and in the decades in which it was enacted and to which it belonged, it can only have been said to have been a resounding success. Since then it has become an anachronism.

CHAPTER VII. Alfalfa: A Single Crop Operation

The timelessness or unchanging character of the Hubbell farming operation is especially apparent in its cropping pattern. Unlike many other northern Arizona farms where a near subsistence kind of diversification was the order of the day, Hubbell's farm was highly specialized. Indeed, it may be said that it was uniquely specialized. It had been conceived as part of a specialized isolated enterprise. Its characteristics included marginal natural resources, cheap labor, distance, and a limited economic community over which Hubbell and his family exerted considerable control. In its early years the Hubbell farm was admirably designed to fill his peculiar needs. It fed his draft animals, supplemented his Indian trade, and served a sheep and goat buying business that in its best years amounted to more than 10,000 head.¹ When trucks replaced work horses by the 1930s and the sheep trade came under increasing regulation during and after the New Deal, new markets for farm produce did not appear. Fundamentally only one crop was grown and cropping patterns changed little or not at all.

A. The Hay Ranch

At various times the Hubbells referred to the Ganado homestead as the "hay ranch."² It was an apt term for a number of reasons. It differentiated the Ganado operation from Hubbell's "bean ranches" at Pinyon Springs, and Vander Wagon near Zuni, and the two "fruit farms" near Farmington. In addition it was descriptive of agriculture on the

Ganado place. Alfalfa hay was the primary crop from the first. With its potential for three or four cuttings per year and its production possibilities of one and a half to two and a half tons per acre, alfalfa's advantages were obvious. Since it returns nitrates to the soil by natural processes, alfalfa wore soil out much less quickly than many crops. It was an excellent forage crop, although its advantages as a horse feed were somewhat limited by the tendency of its dust to induce "heaves," a serious equine respiratorial condition. It could survive relative periods of drouth and was generally well suited to northern Arizona. The strains or varieties planted are not known, but Hubbell was forward-looking in this respect and occasionally corresponded with the Department of Agriculture in efforts to improve yields.³

Hubbell apparently used no rotation system. Corn was grown for table use as green corn but never for forage or grain. There is no evidence that wheat or barley were ever grown, but if they were, they were harvested as hay. In the beginning rye was used as a nurse crop for alfalfa and perhaps on dry land fields or fields watered only once or twice annually, because of its drouth-resistant qualities. Oats, a much more conventional nurse crop, were also used to start alfalfa after 1910.⁴ There is no evidence that threshing was ever done at the Hubbell farm.

Once started, alfalfa fields in other parts of northern Arizona were often not broken up for many years, in some cases not for as much as a quarter century. The Hubbell tendency not to tinker with or change their farming methods leads one to believe that they broke fields up and replanted them only when it was necessary. It seems entirely possible that alfalfa patches first planted around 1905 remained until

1920 or later. On the other hand, Dorothy Hubbell remembers frequent occasions when fields were reseeded.⁵ Rodents, "gophers" according to her account, but perhaps the prairie dogs that still inhabit the abandoned fields, or possibly both, were a primary cause. Their burrows damaged the ditches and borders making it necessary to redo fields with some regularity. Years of drouth or breakdown in the dam or canal may also have killed alfalfa stands, making it necessary to replant.

In other arid farm localities where water could be applied only once or twice in the spring, alfalfa farmers often made excellent returns on alfalfa seed during the 1920s by letting the second or third cutting of hay (depending on moisture) blossom and mature. There is no evidence, however, that the Hubbells ever tried this expedient. Weather conditions in northern Arizona, where July and August are rainy seasons, may have made this practice less appealing than in arid parts of Utah, Nevada, and Idaho where late summer rains were comparatively rare.

As suggested above, alfalfa fit well in Hubbell's turn-of-the-century trading enterprise. It was necessary to feed the fifty or sixty head of horses and mules with which he handled his freight and mail-stage service at Ganado.⁶ He also maintained barns and stables at Gallup, but doubtless bought hay there or shipped it in by rail. He, like other traders, maintained a "hay room" from which hay was sold to Indians a bale or two at a time. Navajos made no attempt to provide hay for their animals generally, and summer and winter alike they foraged for themselves, but riding and work horses often had to have some supplementary feed.⁷ After 1900 he hoped to raise hay to meet needs of the government school at Keams Canyon and had obvious freight

advantages over contractors from outside. Early in his experience with rye and alfalfa hay, Hubbell wrote H. H. Miller, superintendent of the Keams Canyon Indian school, a letter relative to his haying operations, indicating how he hoped it would fit in his enterprises. "I selected the best hay," he wrote:

It is so much better than Alfalfa that we receive, that I thought it best to ship it in the place of the alfalfa. I will follow this up with another load in a day or so. It looks favorable for a good crop of hay this year, and I hope to be able to deliver next year a fine lot of same. I believe I can deliver hay from this farm about the 10th of June. It will be Rye hay, but will be far above the Alfalfa Hay that so far I have been able to get. I hope the hay will prove satisfactory. If it is not please take what you can use at the price you think it is worth.⁹

During good years this worked out nicely. In 1907, for example, Miller acknowledged receipt of 15,160 pounds of hay in May. In September hay raised on the Hubbell farm was counted in three bale lots, loaded thirty bales to a wagon, and shipped to Keams Canyon in several different consignments. The next year the shipping season to Keams Canyon began July 24, when twenty-nine bales were shipped, and extended through December 10.¹⁰ In all nearly 1,000 bales were delivered. Records for the early 1920s show brisk over-the-counter sales at the trading post, some transactions amounting to a half-ton, and some as little as a single bale.¹¹ For years the trading price appears to have been pegged at 4¢ per pound. In 1936 bailing began in May and ran until the following March. A total of 1,360 bales were put up at 125 pounds per bale,¹² making a total of about 85 tons.

Other years, however, there is evidence that Hubbells imported much hay. In 1914 and 1915 for example, correspondence with Hunning and Connell of Las Lunas, New Mexico, shows that Hubbell sometimes bought

hay by the car load. Hunning and Connell hay ran \$13 put down in Gallup in 1913, and in 1914 cost \$14 for "number one" alfalfa hay, a dollar per ton less for "number two" and two dollars less for "meadow hay." Hubbell dickered for one to four cars at different times, and apparently purchased them, because freight records show many wagon loads of hay coming into Ganado.¹³ Much later, after trucks and good roads had become common, hundreds of tons of hay were hauled from the Salt River Valley to meet Hubbell Trading Post contracts and over-the-counter trade during the drouth of 1930-1934.¹⁴

B. Haying Operations

Hay was handled with machinery on the Hubbell farm, from at least as early as 1903 when the first hay baler was purchased. Sam Day, Sr., who sold Hubbell the machine, was at Chinle much of the time during these years and one wonders if it might have been a used machine that Day had used earlier at his Cienega Amerilla place.¹⁵

Hubbell also made inquiries about a manure spreader in 1907 and evidently bought one soon after, which suggests that the abundance of cheap labor did not commit him to tedious outmoded hand methods.¹⁶ In the early years there is no evidence that he bought mowing machines and rakes, but he paid taxes on "farm machinery" prior to 1910 which together with the fact that he bought a baler in 1903 makes it seem certain that he had these implements as well.¹⁷

The farm work force was always large. Both Friday Kinlichinee and Mrs. Hubbell reported peak crews of up to twenty men. Time sheets from

1939 indicating that seven or eight men were employed regularly and showing up to eighteen employees during haying season, establish beyond doubt that their memories are sound. These time sheets almost certainly show only Navajo laborers. Before his death John Lorenzo and his son, Roman, managed the farm much of the time; later, Roman, and still later his widow, Dorothy Hubbell ran it. At times there appears to have been a foreman employed as well. A Mr. Collins served in this capacity sometime prior to 1920. Siez , a trusted Mexican employee of the Hubbells is reported by Howard Gorman and Chester Hubbard to have bossed the farm for many years. Mrs. Hubbell, however, is certain they misunderstood his function.¹⁸ Whatever the case, there can be no doubt that Indian workers actually did the farming. While some of them were skilled and careful, there was a good deal of turnover, and the Hubbell farming operation frequently suffered from their disinterest. For example, during the 1920s an Indian driver is said to have turned over a tractor in the arroyo, probably the one that separates the present trailer court from the rest of the farm. However, blacksmiths and mechanics were always on the place and kept the farm equipment operable as well as the wagons and trucks.

Hay was hauled loose on hay racks from the fields. Friday Kinlichinee recalls that four wagons were used, each handled by a teamster and a fork man. A field crew of four men and a stacking crew of four rounded out the total work force of sixteen. Certainly there was variation in this. For one thing, four seems an excessive number of wagons. Considering the short haul, two, or no more than three, certainly could have kept field and stack crews hard at work. Hay was always put on the wagon with

a fork. Mr. Kinlichinee recalls no time when any mechanical loader was used. Although Hubbell owned a crawler tractor by 1930, a farm tractor by the 1950s, and field balers were everywhere in use by that time, Mr. Kinlichinee remembers only horse power and hand-working of loose hay.¹⁹

At some point, a derrick or hay pole was installed, and hay was loaded on a sling laid over the hay rack on the wagon, which enabled them to lift entire loads off by horse power, greatly facilitating the stackyard process. At least one picture shows several good-sized stacks in a yard southwest of the barn.¹⁹ Since no one has memory of storing loose hay in the barn, it is safe for the present at least to assume that hay was always stacked in the yard first and baled later. In keeping with widely accepted customs of the time, hay fed on the place would almost certainly have been fed from the stack.

The barn itself is much more closely related to the trading and freighting business than it is to farming. Its very design is more urban than agricultural. Like livery barns and carriage houses of the late 19th and early 20th centuries it accommodated stables, tack room, and smithing facilities for shoeing horses and repairing wagons and, as time changed, repairing trucks. Like livery barns, it served both as a stable and as a feed store. In addition it was very much like the warehouses one would have found in Gallup, Holbrook, and Winslow prior to 1920, although few of them would have been as well built or impressive architecturally.

Like the haying process, baling was a job that employed a good-sized crew. Balers, two of which remain south of the barn, were primitive stationary apparatuses powered by a sweep pulled by one or two horses

which endlessly circled the baler, stepping over its low end in their rotation. No specific data is available to indicate how much hay could be baled in a day, although shipping rhythms suggest that they rarely baled more than 125 bales per day, and Mr. Kinlichinee recalls that their usual pattern was to operate only for a long forenoon each day.

C. Static Cropping Pattern

Although we shall discuss a few other crops that were raised on the Hubbell farm, hay was obviously the chief crop. In an era and a region subject to change and adaptation, an entire array of production factors fixed the Hubbell farm in the haying mold. The ranch was beyond the reach of outside markets. The Hubbell sons never saw their prospects as being directly related to the farm and were not driven to experiment with it to improve profits. There was never any sense that it ought to be utilized more intensively to provide opportunities for upcoming generations or new members of the family. The practice of running it under their own general and sometimes casual supervision with Navajos to work it, tended also to inhibit change because adaptation required new skills that no one was really willing to gear up for.

To a degree the farm had also been brought into existence for purposes that were not directly economic. It was part of the Hubbell mystique, a mood piece as it were. To crop it differently was to alter the contributions it made in this sense. Additional factors that inhibited change in cropping patterns included the nature of the water supply, the unusual relationship to the government, and its remotness from

markets, land promotions, and profit-motivated neighbors. For these reasons the Hubbell farm, including its long dependence upon alfalfa as a crop, has a strange quality of timelessness and motionlessness about it. It is as though the model were stricken off and remained unchanged thereafter.

D. Fruit, Pasture, and Truck Crops

If no other cash crops were raised, a number of interesting incidental cropping efforts were made. Doubtless the most interesting of these, and perhaps when the full story is known the most important, is fruit.

Hubbell was interested in raising fruit there from the time water was first developed. The early 1900s were a time of intense interest in horticulture regionally. Each of the four-corners states had its areas of fruit culture, and Arizona state policy favored fruit growing. Hubbell was very much a product of the times in his flirtation with fruit trees, and his later acquisition of the Farmington fruit farms indicates his sense that fruit he raised himself could become important to his trading business.

However, he likely learned quickly that Ganado's elevation (about 6,300 feet) and the region's raw spring climate did not lend itself well to fruit growing. There is some hint that a large number of trees may have been planted east of the trading post, but it remains to be shown definitely whether or not orchards as such were ever planted.

On the other hand, it is clear he planted fruit trees along many of the laterals and the head ditch. This had the obvious advantage of

placing them near moist soil otherwise unused. Among the varieties planted were plums, apricots, pears, and apples. Shipping notices for about 200 apple trees in 1906 made it clear that the irrigation system was working by that year or before. From the Spencer Seedless Apple Company of New Mexico in Roswell, 110 "seedless apple trees" were shipped on December 12, 1906, with instructions to plant them at once. In February of the same year a Wichita nursery had also sent both apple and pear trees.²⁰

One finds no evidence that the experiments with fruit were successful. People who visited the place sometimes mentioned fruit trees and vineyards as well. Some recalled fruit picked from plum trees and the role of black walnuts as a source of natural dyes for Indian weavers. But the fact that Hubbell purchased the two Farmington fruit farms suggests that little or no fruit was raised at Ganado.

The fruit trees have some bearing upon the use of the Hubbell fields for pasture. To the extent that it was hoped fruit would be produced, the trees would likely have been protected from horses which could have reached foliage on the smallish trees that grew on the Hubbell ditch banks and under some circumstances would have chewed their bark. Another factor that bears on pasture use for horses is the fact that Hubbells kept only draft and saddle animals. There were apparently never any brood mares.²¹ During freighting and farming seasons, working teams may well have been kept in and fed. An alfalfa farm, however, often had a partial growth that could be grazed after frost in the fall. Whether the trees were prized highly enough to keep horses out is beyond knowing at this point, but it does seem certain that with the precautions taken by farmers everywhere against bloat, that sheep and the two dairy cows that were generally kept could well have run on the frosted hay fields.

Runt herds and sheep needing to make a quick gain were often held there for a few weeks.²² In the spring, also, there would have been a time between first greening and effective growth when fields could be pastured. The east arroyo, as well as the Rio Pueblo Colorado, both of which ran through Hubbell property, could also have provided pasture. However, this would have been so only to the extent that they were under fence, as Indian stock would have grazed down any unfenced feed. There is no physical or recorded evidence of pastures especially fenced for the milk cows or for other purposes unless it is the little arroyo running between the present trailer court and the field east of the trading post.

More must be learned about the role the farm played as a pasture. There can be no doubt that in the long run it was a significant role. It is in some respects an incidental role as well. Consequently, written sources of information will be difficult to find. Oral sources, however, hold considerable promise.

In conclusion a few words should be said about the kitchen garden and what may be called household animals. Gardens were grown from at least 1900 and perhaps before. Ganado proved to have a good climate for many truck crops, although its elevation may have complicated raising such frost-sensitive plants as tomatoes.²³ Sweet and Indian corn both did well, as did a wide variety of truck vegetables and melons. This topic has been the object of some attention in the various trading post studies that have been made, and Mrs. Hubbell had a close connection with the gardens during the years since 1920 and should be able to provide fuller information if properly questioned.

Along with the dairy cows, chickens and hogs were maintained for

the convenience of the house. Both Kean and Barney Williams are said to have been surrounding themselves with such amenities by the early 1880s. Hubbell himself had chickens by 1900 and paid taxes on them regularly after 1902. Usually he listed only twenty-five, but sometimes fifty or more. Hogs were only kept occasionally, if his tax records are to be depended upon. He almost always listed the two cows, and for a brief period listed a dairy bull on his tax filing. Although Lorenzo, Jr. evidently had cattle, and at least one letter refers to a small number of cattle bearing the old gentleman's brand, there is no evidence that Hubbell kept range cattle at Ganado.²⁴

In summary, it may be said that the Ganado place was an "alfalfa ranch," but that at times rye and oat hay were raised to facilitate the larger objective of raising alfalfa. Pasture was an important sideline of the alfalfa culture, and as the farm declined, may have become increasingly important. Fruit was an interesting, but unsuccessful experiment. Truck crops, milk cows, and poultry were essential to a comfortable existence until modern refrigeration and regular delivery of perishable products became feasible after 1940.



¹J. L. Hubbell to Lorenzo Hubbell, Jr., April 6, 1912. Farm Folders, Working Papers, Hubbell Trading Post National Historic Site, hereafter cited as WPHTP. What I have chosen to call "Working Papers" is a rich collection of material gathered over the years to aid the personnel of the HTP in their interpretive and planning efforts. Gathered at random, much of it is not cited as to its original source and thus is somewhat less than ideal for this sort of paper.

²J. L. Hubbell to Roman Hubbell, April 6, 1912, WPHTP.

³John Lorenzo Hubbell as told to John Edwin Hogg, "Fifty Years an Indian Trader," Touring Topics, XXII (December 1930) 24-51. My access to this article has been a typescript made by Frank McNitt found in the McNitt Collection, New Mexico State Records Center & Archives, hereafter cited as McNitt Collection.

⁴In addition to Hubbell and Hogg, "Fifty Years an Indian Trader", my impressions of Hubbell in the main rely on Dorothy S. Hubbell, Untranscribed Oral History interviewed by Edgar Moore, March 1979, WPHTP and Dorothy S. Hubbell, Oral History interviewed by David Brugge, March 1973, handtranscribed, WPHTB; Frank McNitt, The Indian Traders, (Norman, 1962) especially chapters 10, 15, and 16; Dane and Mary Roberts Coolidge, The Navajo Indians, (Boston, 1930); Le Charles G. Eckel, "History of Ganado, Arizona," Museum Notes: Museum of Northern Arizona, 6 (April 1934) 48-50; and Richard F. Van Valkenburgh, Dine' Bikéyah, edited by L. W. Adams and J. C. McPhee, (Window Rock, 1941); and Dorothy C. Mott, "Don Lorenzo Hubbell of Ganado," Arizona Historical Review, 4 (April 1931) 45-51. All of these sources more or less distort and mythologize Hubbell and no doubt I have fallen victim of the same influences. A biography that takes the real measure of the man is badly needed. Some idea of how the Hubbell legend has tended to get out of hand may be seen from the following quote that leaves Hubbell nameless, but which sows misunderstanding and confusion in almost all it says: "The original grant of one of these early traders, whose post was not far from the one at Wide Ruins, had run clear from the Rio Grande to Rio Puerco. He had died some years before, but Sallie and Bill [Lippencott] heard a good deal about him still. He had been Spanish, but looked like Theodore Roosevelt, except that his fierce white mustaches had turned up, instead of down. He had once gone hunting in Africa with Roosevelt, and the old Moorish-type house in the desert had its walls so covered with trophies from that trip, and with Spanish ancestral things which had come around the Horn, the walls themselves were completely hidden. He had been quite a figure in the Southwest, that trader and sometimes the new young traders would go call on his daughters. The daughters would sit primly in high old rockers, working black lace Spanish hankkerchiefs while they made polite conversation about how hard

clothes were to get in that part of the country, and about the servants-- and a Navaho maid would serve formal tea." Alberta Hannum, Spin a Silver Dollar: The Story of a Desert Trading-Post, (New York, 1944) 35-36.

⁵For Hubbell's influence on Navajo weaving and his relationship with the Indians generally see McNitt, The Indian Traders, 208-212; also C. A. Amsden, Navaho Weaving, (Albuquerque, 1949); and G. A. Reichard, Navajo Shepherd and Weaver, (New York, 1936).

⁶Garland was among Hubbell's many visitors spending two weeks at his place late in 1899. While there, he took notes on the "post and the Navajos who came to it . . . and plans for two stories, presumably suggested by Hubbell." Lonnie E. Underhill and D. F. Littlefield, Jr., Hamlin Garland's Observations on the American Indian, 1895-1905 (Tucson, 1976) 29. He also got the idea for an article on Hubbell which with names thinly disguised appeared as "Delmar of Pima," McClure's Magazine, 18 (February 1902) 340-348.

⁷For a gripping account of Richard Wetherill's death at the hands of a Navajo assassin see Frank McNitt, Richard Wetherill: Anasazi, re. ed. (Albuquerque, 1966) 5-8 and 255-318; for Lot Smith's demise at Tuba City see Charles Peterson, Take Up Your Mission: Mormon Colonizing Along the Little Colorado . . . (Tucson, 1973) 121 and 203; also "'A Mighty Man Was Brother Lot': A Portrait of Lot Smith, Mormon Pioneer," Western Historical Quarterly, 1 (October 1970) 394-414.

⁸Frank McNitt attributes the hard times that Hubbell experienced during the 1920s to the cost of this campaign. This may well have been true. If so, it would seem that Hubbell's association with the Roosevelt family may have had some bearing on it due to the fact that Hubbell was encouraged to run by the former president's nephew Nicholas Roosevelt and possibly by T. R. himself. See Nicholas Roosevelt to J. L. Hubbell, October 19 (no year), Roosevelts File, WPHTP.

CHAPTER II

¹Dorothy S. Hubbell, Sun City, Arizona, apparently has the original of this document. Copies exist in the Water File HTP and in my possession.

²Dorothy S. Hubbell, Oral History March 1973, interviewed by David Brugge, WPHTP.

³Dorothy S. Hubbell, Conversation with Charles Peterson August 16, 1983 and Telephone Conversation September 12, 1983. Notes in my possession.

⁴Richard Van Valkenburg, Diné Bikiyah 64.

⁵Lt. J. H. Simpson, "The Report of Lieutenant J. H. Simpson of an Expedition into the Navaho Country in 1849. . .," 31 Cong., 1 sess., Sen. Exec. Doc. 64; A Pathfinder in the Southwest: The Itinerary of Lieutenant A. W. Whipple . . . in the Years 1853 & 1854, ed. Grant Foreman, (Norman, 1941); and Uncle Sam's Camels: . . . the Report of Edward Fitzgerald Beale (1857-1858), ed. by Lewis Burt Lesley, (Cambridge, 1929).

⁶Lt. Joseph C. Ives, "Report Upon the Colorado River of the West," 36th Cong., 1 sess., Sen. Exec. Doc. 128-131.

7. For an account of the development of the 35th parallel as a railroad route with emphasis upon land see William S. Greever, Arid Domain: The Santa Fe Railway and Its Western Land Grant, (Palo Alto, 1954).

⁸James H. McClintock, Mormon Settlement in Arizona: A Record of Peaceful Conquest of the Desert, (Phoenix, 1921) 170; for a description of Hubbell's St. Johns store and the town in 1879 see Joseph Fish, The Life and Times of Joseph Fish, Mormon Pioneer, ed. John H. Krenkel, (Danville, Illinois, 1970) 200-201.

⁹See Notices Effecting Real Estate #1, Apache County Recorder's Office, St. Johns, Arizona 1.

¹⁰Joseph Fish recounts that at the height of the Mormon-Gentile conflict in St. Johns "Hubbell stated that he would fight them [the Mormons] until Hell froze over and then give them a round on the ice, but notwithstanding this assertion, he and two or three others turned and later became the friends of the Mormons." Life and Times of Joseph Fish 248. Aside from the interest of a fiery young Hubbell taking a strong position, this statement is important because of what it signifies about Hubbell in a larger sense. Rarely does one come across a figure in history who is active in major issues who handles things more effectively in the long run so as to generate goodwill and support. It is a secret to Hubbell's success in the successive measures that were necessary in securing his land and water rights on the Navajo reservation.

¹¹McNitt, Indian Traders 200-202; Hubbell himself uses "possessory rights" to describe the value of his improvements and claims at Ganado in an 1889 "Recapitulation," Folder 7, Box 496, Hubbell Papers, at the University of Arizona Library, hereafter cited as HPUAL.

¹²Reference to "January 1887 Record Book, HPUAL" in a typescript item entitled "Documentation of J. L. Hubbell for the 19th Century," in WPHTP.

¹³Earle R. Forrest, Arizona's Dark and Bloody Ground, rev. ed., (Caldwell, 1962) chapters 7 and 15 gives a good account of Apache County's outlawry and strife during these years that credits Commodore Perry Owens and a vigilance committee with bringing things under control in 1887.

¹⁴By implication and statement McNitt keeps Hubbell in the foreground at Ganado during the entire decade (1885-1896) of his association with Cotton, yet offers almost no evidence to locate Hubbell at Ganado, Indian Traders 213-224.

¹⁵Hubbell and Hogg, "Fifty Years An Indian Trader" 5.

¹⁶McNitt, Indian Traders 245-258; for an excellent treatment of the Treaty of 1868, see John L. Kessell, "General Sherman and the Navajo Treaty of 1868: A Basic and Expedient Misunderstanding," Western Historical Quarterly, XII (July 1981) 251-272.

¹⁷John Gregory Bourke, The Snake-Dance of the Moquis of Arizona . . . Journey from Santa Fe . . . to the Villages of the Moqui . . ., rept., (Chicago, 1962) 67-78.

¹⁸Bourke, The Snake-Dance of the Moquis 82-84.

¹⁹Herbert Welsh, Report of a Visit to the Navajo, Pueblo, and Hualapais Indians of New Mexico and Arizona, (Philadelphia, 1885) 22-24.

²⁰Welsh, Report of a Visit to the Navajo 32.

²¹McNitt, Indian Traders 197; Van Valkenburg, Dine' Biqueyah 64-65.

²²This is apparent in the fact that he purchased William Leonard's claims and improvements and that in the earliest "recapitulation" of his assets available, lists "improvements and possessory rights" at \$1,000, the largest single item in 1889. See Folder 7, Box 496, HPUAL.

¹C. N. Cotton to J. J. Belden, August 11, 1890, 57 Cong., 1 sess., Sen. Rept. 2042 (1902) 2.

²W. C. Brown, "Report Upon Condition of the Navajo Indian Country," 52 Cong., 2 sess., Sen. Exec. Doc. 68 (1893) 26-27 and Map 16.

³See Guide to Hubbell Papers, prep. Clinton Colby (Tucson, 1978) for a quick survey of papers in Cotton's name.

⁴Frank McNitt, Indian Traders 213-224; and McNitt to David Brugge, August 31, 1968, WPHTP.

⁵William S. Greever, Arid Domain; and Charles Peterson, Mormon Colonizing Along the Little Colorado 164-175.

⁶Will C. Barnes, Apaches & Longhorns: The Reminiscences of Will C. Barnes, ed., Frank C. Lockwood, rpt., (Tucson, 1982) 118-196.

⁷Peterson, Mormon Colonizing 172-175; G. S. Tanner and J. M. Richards, Colonization . . . The Joseph City Region (Flagstaff, 1977) 85-88; and Hse. Exec. Doc. 232 (188) 21-22.

⁸See Navajo Agency Reports in the Annual Report of the Commissioner of Indian Affairs for virtually any year between 1882 and 1900. Good examples are Report of Agent S. S. Patterson, Report of Commissioner, (1886) 420-422 and Report of Agent C. E. Vandever, Report of Commissioner, (1889) 255-261.

⁹Report of C. E. Vandever, Report of Commissioner, (1890) 160-161; the Commissioner followed up with a recommendation to the President that the reservation be divided into "survey districts," that army officers be assigned to carry out the survey and that estimates be made as to costs; see S. E. Shoemaker, "Report to the Commissioner of Indian Affairs, March 14, 1900." A copy is in Series 7 File 139 of the Richard F. Van Valkenburgh Papers, Arizona Historical Society, hereafter Van Valkenburgh Papers.

¹⁰Thomas V. Keam to Herbert Welsh, November 24, 1888, Keam-Welsh Correspondence, Indian Rights Association Archives, Philadelphia, Pa. Although Keam refers to Erville specifically as governor of Arizona Territory in 1881, he was apparently not appointed governor; and I can find no reference to him as acting governor or in other official capacity.

¹¹ Frank McNitt, The Indian Traders 186-189, leaves the reader with the impression that Keam acquired title to Desert Land Act entry. The Keam-Welsh Correspondence, however, makes it seem very unlikely that he ever did. Information on the value of Keam's improvements and transactions with the Indian Service are found in Keam to Welsh, November 24, 1888 and an attachment to that letter and in other letters that followed in 1888 and 1889, Indian Rights Association Archives.

¹² 56 Cong., 1 sess., Sen. Rept. 699 (1900) 2; and Congressional Record, 35 Pt. 8 (1902) 7649.

¹³ 57 Cong., 1 sess., Sen. Rept. 2042 (1902) 2.

¹⁴ 57 Cong., 1 sess., Sen. Rept. 2042 (1902) 3, underlining is original.

¹⁵ 56 Cong., 1 sess., Sen. Rept. 699 (1900) 2.

¹⁶ 56 Cong., 1 sess., Sen. Rept. 699 (1900) 3.

¹⁸ 56 Cong., 1 sess., Sen. Rept. 699 (1900) 1-4; and 57 Cong., 1 sess., Sen. Rept. 2042 (1902) 1-5.

¹⁹ 56 Cong., 1 sess., Sen. Rept. 699 (1900) 1-4; and 57 Cong., 1 sess., Sen. Rept. 2042 (1902) 1-5.

²⁰ Constant Williams to J. L. Hubbell August 12, 1899, WPHTP.

²¹ 56 Cong., 1 sess., Sen. Rept. 699 (1900) 3; and 57 Cong. 1 sess., Sen. Rept. 2042 (1902) 3-4.

²² G. W. Hayzlett to Col. L. B. Henderson, December 2, 1899, Ft. Defiance Letterbooks, FD-27, pp 185-86. My access to this was a typed copy among the WPHTP. It seems likely it was copied by David Brugge, but it may have been copied by Frank McNitt and given to Brugge; in any event the problem with sources that one deals with in the "free floating" documents in the WPHTP is illustrated by this. D. B. Henderson was congressman from Iowa and was Speaker of the House in the 56th and 57th congresses. See Who's Who in America 1906-1907, 817.

²³ For Hubbell's role with the Presbyterians see Cora B. Salsbury, Forty Years in the Desert: a History of Ganado Mission 1901-1941, (n. p., n. d), Salsbury also indicates that he "pointed out a fine site for a Mission and also a site for a future dam which would irrigate the whole Ganado Valley." 14.

²⁴57 Cong., 1 sess., Sen. Rept. 2042 (1902) 4-5.

²⁵S. M. Brosius to J. L. Hubbell July 2, 1902, WPHTP. Brosius had been a congressman from Pennsylvania in the late 1880s and early 1890s. By 1900 he was head of the Washington Agency of the Indian Rights Association and although he seemed just a bit embarrassed about accepting money for pushing Hubbell's claim through congress, acknowledged he had done the service and ought to be paid.

²⁶This rule of thumb, as well as problems connected with the resurvey of Hubbell's land after 1912, was spelled out in a letter from lawyer Robt. E. Morrison of Prescott to Hubbell, September 18, 1912, WPHTP.

²⁷S. E. Day to J. L. Hubbell, July 22, 1906, Day File Box 23, HPUAL; and Frank McNitt, Indian Traders 247.

²⁸Lyman W. Wakefield to J. L. Hubbell, March 18, 1906, WPHTP.

²⁹See Survey notes and maps of survey of "Subdivision of T. 27 N., R. 26 E., conducted during September 1915 by Frederick C. Miller, U. S. Surveyor. Filed on November 24, 1917 in Book 2962 of the Phoenix Land Office extracts in WPHTP; also see F. C. Miller to J. L. Hubbell, July 1, 1915 with further reference to the survey, WPHTP.

CHAPTER IV

¹These three depositions were taken in April 1908. Copies are in Box 329, HPUAL and WPHTP.

²Dorothy S. Hubbell, Oral History, March 1973.

³Friday Kinlichinee, Ganado, Arizona, Conversation with Charles Peterson, August 3, 1983.

⁴Howard Gorman, Ganado, Arizona, Conversation with Charles Peterson, August 2, 1983. According to Gorman "J. L. Hubbell, Teddy Roosevelt, and Robert James were riding abreast up the canyon. On the way back they stopped at a spot overlooking the site of the irrigation project. Hubbell stopped and said 'just imagine this built up with a reservoir' and showed him. Teddy Roosevelt said 'How you going to do it?' 'Navajos can do it with a scoop and bring the water down,' Hubbell said. Teddy Roosevelt, 'I'll look into it. If it can be done I'll see you get the money.'"

- ⁵ Arthur Hubbard, Ganado, Arizona, Conversation with Charles Peterson, August 25, 1983.
- ⁶ Dorothy S. Hubbell, Oral History, March 1973.
- ⁷ Hubbell and Hogg, "Fifty Years an Indian Trader," 5
- ^{7a} Hubbell and Hogg, "Fifty Years an Indian Trader," 5
- ⁸ Report of Levi Chubbeck, Special Inspector, to the Secretary of the Interior, May 6, 1904, WPHTP.
- ⁹ Hubbell agreement with the Department of the Interior, 1913.
- ¹⁰ Report of Commissioner (1913) 19.
- ¹¹ Norris Hundley, Jr., "The 'Winters' Decision and Indian Water Rights: A Mystery Reexamined," Western Historical Quarterly XIII (January 1982) 17-18.
- ¹² For an excellent examination of the Winters' Doctrine including the situation from which it grew and what its impact has been see Hundley, "The 'Winters' Decision and Indian Water Rights," 17-42; and Hundley, "The Dark and Bloody Ground of Indian Water Rights: Confusion Elevated to Principle," Western Historical Quarterly IX (October 1978) 455-482.
- ¹³ Report of Commissioner (1913) 19.
- ¹⁴ G. W. Hayzlett to Col. L. B. Henderson, December 2, 1899, 185-187.
- ¹⁵ Hubbell-Department of the Interior Agreement 1913.
- ¹⁶ Decisions of the Department of the Interior Relating to Public Lands, XII (Washington, 1891) 207-208.
- ¹⁷ Report of the Special Committee . . . on the Irrigation and Reclamation of Arid Lands, 51 Cong., 1 sess., Sen. Rept. 928, Arizona Hearings, especially Maricopa and Pima counties, (1889) 400-498; although the Apache County hearing before the Senate Committee showed little of the heady spirit of promotion that characterized witnesses from the Phoenix and Tucson areas filings on possible water sources multiplied even there.

See Notices Water Locations #1; Notices Water Locations #2; and Application for Water Right #1, Apache County Recorder's Office.

¹⁹For good treatments of the tragedy connected with overpopulation of marginal and submarginal regions see Donald Worster, Dust Bowl: the Southern Plains in the 1930s (New York, 1979); and Walter J. Stein, California and the Dust Bowl Migration, (Westpoint, 1973).

I know of no adequate account of the impact of the overexpansion of the farmer's frontier in the Four Corners Area but the impact on the Navajos gives some hint. See Richard White, The Roots of Dependency: Subsistence, Environment, and Social Change among the Choctaws, Pawnees, and Navajos (Lincoln, 1983) 212-323. Some idea of what overextending meant in Utah may be seen in the five northwestern counties into which more than 5,000 families followed hardsell promotion between the enactment of the Enlarged Homestead Act in 1909 and 1920. By the mid-1930s the failure rate was well over ninety percent. Experience was only somewhat less disastrous in the Uinta Basin and in Utah's San Juan. See J. Howard Maughan, "Continuation of Study of the Extent of Desirable Major Land-Use Adjustments and Areas Suitable for Settlement," (July 1936); and A. F. Bracken, "State Report on Land-Use Study for Utah," (May 1935), Utah State University Library.

²⁰Richard White, The Roots of Dependency 212-234; and Reports of Commissioners (1883-1900).

²¹Frank McNitt, Indian Traders, 192-199 presents Keam's story; the Keam-Welsh Correspondence in the IRA Archives allows one to trace Keam's interest in education for the Indians from 1887 to 1895 first-hand. See Reports of Commissioners for 1890, 1891, 1892, 1898, and especially 1899, (158), for the growth of schools. In 1890 Agent C. E. Vandever and Herbert Welsh of the Indian Rights Association toured the reservation finding no schools except for the agency school that had opened the year before, and no missionaries.

²²W. C. Brown, "Report Upon Condition of the Navajo Indian Country," 22.

²³Report of Commissioner (1901) 103.

²⁴The Acting Commissioner to G. W. Hayzlett, September 25, 1901, Series 7, File 139, Van Valkenburgh Papers.

25 Major E. Backus, Ft. Defiance, "Report of Farming Operation Carried on by Troops During the Year 1852," July 1, 1852; Box 1, McNitt Collection; unsuccessful efforts were also made to divert "Canon Bonito Creek" by Agent D. M. Riordan in 1884. See Riordan letters to Indian Commissioner January 31 and February 4 and 8, 1884, Series 7, File 139, Van Valkenburg Papers. By September when he wrote his report to the Commissioner, high hopes had been supplanted with disgust. "As there are no running streams it [the reservation] can only be watered with a bucket." Report of the Commissioner (1884) 177; Agent S. S. Patterson was still down on farming at Ft. Defiance, but more sanguine about the beginnings of irrigation generally when he reported in 1887. Report of Commissioner (1887) 255-257.

26 Report of Commissioner (1888) 190.

27 The next agent wrote in deep scorn about the efforts of his predecessors. "I have been over the ground where the work was done, and am sorry to say it amounts to nothing." Report of Commissioner (1889) 257. Subsequent agents were not much kinder in assessing his work.

28 Lt. W. C. Brown, "Report Upon Condition of the Navajo Indian Country," 1-6.

29 Lt. W. C. Brown, "Report Upon Condition of the Navajo Indian Country," 27 and Map 16.

30 On December 5, 1922 the agent at Ft. Defiance wrote the Commissioner that "the north side canal contains a great deal of adobe and is badly cut up by arroyos, and if leveled and graded would take an enormous amount of work to put in tillable condition. I believe that the Indians would be unable to irrigate and farm this land successfully." Water File HTP.

31 Arizona's basic water laws as of 1890 are to be found in U. S., Bureau of the Census, Fourteenth Census of the United States, 1920, Irrigation and Drainage, VII, Arizona 110; and Report of the Special Committee . . . on Irrigation and Reclamation, Arizona Hearings 495-497.

32 Session Laws of the 16th Legislative Assembly (Phoenix, 1893) 15-16 and 119; see also Journals of the 17th Legislature of Arizona (Phoenix, 1893) 87, 96, 145, 344, 358, 359.

¹S. E. Day to H. L. Hubbell, July 7, 1906 discusses delays he had encountered in survey of "Hubbell's townships" and lays fault at the door of the surveyor general, Day File, Box 23, HPUAL.

²Herbert E. Gregory, The Navajo Country, United States Geological Survey, Water-Supply Paper 380 (Washington, D.C., 1916) 110-111.

³Repeated washouts had been the experience on the reservation, for examples see S. E. Shoemaker, "Report to the Commissioner of Indian Affairs," March 14, 1900, Van Valkenburgh Papers; and D. M. Rioridan letters to the Indian Commissioner January and February 1884, in Val Valkenburgh Papers; Charles S. Peterson, Mormon Colonizing 176-191; and Look to the Mountains: Southeastern Utah and the La Sal National Forest (Provo, 1975) 37-54 detail scores of disasters on Mormon irrigation projects on the Little Colorado and the San Juan.

⁴Agent R. Perry to J. L. Hubbell, March 24, 1904, BIA File, WPHTP.

⁵Paul Brizzard Deposition Before the Register, Phoenix Land Office, April 1908, Box 329 HPUAL; also Appendix II.

⁶Gregory, The Navajo Country 110-111.

⁷Much of the information relating to the farm and the layout of its irrigation system comes from Farmlands Field Notes taken from thorough on-site examinations while I was in Ganado August 3 and 25, 1983; and 1931 map of J. L. Hubbell Homestead prepared by the Indian Irrigation Service which appears as Map 17 of seventeen maps and drawings provided by the Bureau of Indian Affairs Office of Land Operations at Window Rock, Arizona, copies of which appear as Appendix V.

⁸Levi Chubbeck to the Secretary of the Interior, May 6, 1904.

⁹Friday Kinlichinee, Conversation, August 3, 1983.

¹⁰Farmlands Field Notes, August 1983 and Map 17, Appendix V.

¹¹Hubbell's library still contains Bureau of the Census and Department of Agriculture publications that contain information about check irrigation as well as D. H. Anderson, The Primer of Irrigation (Chicago, 1903), see especially 135-237. Also see U. S., Bureau of the Census, Twelfth Census of the United States, 1900, Agriculture, VI Part II, Crops and Irrigation,

810-811 from which the following is taken. "Flooding is done by the check system and wild flooding. By the latter process, the irrigator turns the water from a ditch over a level field and completely submerges it. Perfectly level fields are, however, comparatively rare, and the first step in primitive agriculture by irrigation has been to build a low ridge around two or three sides of a slightly sloping field, so that the water is held in ponds. These low banks are commonly known as levees or checks. In construction they are frequently laid out at right angles, dividing the land into a number of compartments. Water is turned from a ditch into the highest of these compartments, and when the ground is flooded the bank of the lower side is cut or a small sluiceway opened, and the water passed into the next field.

This flooding in rectangular checks is practiced most largely by the Chinese gardeners and by the Mexicans living along the Rio Grande. . . . Many of the early settlers in the southwest imitated the Mexicans, or employed them as laborers, building checks upon the same general plan, but usually enclosing more ground."

¹² Arthur Hubbard Conversation, August 25, 1983.

¹³ Dorothy S. Hubbell, Oral History, March 1973.

¹⁴ Report of Commissioner (1905) 167-171.

¹⁵ Hamlin Garland, "Delmar of Pima," McClure's Magazine, 18 (February 1902) 340-348.

¹⁶ Among others, Levi Chubbeck, Herbert Gregory, and H. F. Robinson, superintendent of Irrigation in the Indian Irrigation Service, were acquainted with the Hubbell irrigation system during its years of construction. Particularly the latter two were instrumental in the negotiations leading to the government's take over of Hubbell's canal and diversion works.

¹⁷ Before the development of drouth resistant strains of wheat, rye was often planted in water-short areas. Typical was Howard Maughn's discussion of practices in Utah's west deserts where people came after 1909 hoping to grow wheat. A million-and-a-quarter acres of land were "broken and grain planted, but about the only crop that ever grew was rye and that was usually a failure." Maughan, "Continuation of Study of the Extent of Desirable Major Land-Use Adjustments and Areas Suitable for Settlement," (1936) 7.

¹⁸ Friday Kinlichinee Conversation, August 3, 1983.

¹⁹Farmlands Field Notes, August 1983.

²⁰S. E. Day to H. L. Hubbell, August 15, 1908, Day File Box 23 HPUAL.

²¹Chester Hubbard of Ft. Wingate, recalled riding with his older brother Arthur, in the 1930s as the latter hauled dirt to raise the dam. Chester Hubbard Conversation, August 5, 1983, with Charles Peterson. Arthur Hubbard recalled driving truck on the project and fixed the year as 1936. Arthur Hubbard Conversation, August 25, 1983.

²²David M. Brugge, A History of the Chaco Navajos (Albuquerque, 1980) 155 and 159 indicates that Chaco Canyon archaeological digs paid \$13 per month for Indian labor in the early 1890s and 50¢ per day and board in the late 1890s.

²³Between 1899 and 1905 agents reported that from 300 to 400 Navajos worked for the Santa Fe Railroad each year. The lowest rate given was 1899 when it was reported they received about \$21 per month. In 1905 they were said to receive \$2 per day. Several times it was reported they were paid \$1.10 or \$1.25. Work in Colorado's beet fields was erratic and brought only \$1 per day. See Reports of Commissioners (1899) 156-157; (1900) 191; (1901) 100-102; (1903) 126; (1905) 169.

²⁴Book 1, Box 403, HPUAL.

²⁵As part of his deal with the Department of the Interior, Hubbell agreed to reopen the store at the dam. His son Roman was directed to apply for the license; and company books, as well as the memory of local people indicate that the store at the dam functioned well into the 1920s. See J. L. Hubbell to Roman Hubbell, April 6, 1912, WPHTP. David Hubbard, whose farm was at the head of the canal, and consequently lived nearby, is said to have run it for a time in the mid-1920s, perhaps in 1926. Arthur Hubbard Conversation, August 25, 1983.

²⁶William Y. Adams, Shonto: A Study of the Role of the Trader in a Modern Navaho Community, (Washington, D. C., 1963).

²⁷Frank McNitt notes a "fortress" like quality in Hubbell's buildings and attributes his affinity for building "on a massive scale" to "something in his Spanish heritage," Indian Traders 216-217. This seems likely enough, but even more important, is his ability to play the role of the

"Hidalgo" and to play it well. All traders, if one accepts William Adams' interpretation, tended to develop a community around them. Hubbell once asked Sam Day to bring "your Indians," evidently to help on some aspect of irrigation development. Hubbell, too, was able to manipulate "his Indians" to the benefit of his project. HPUAL

²⁸Paul Brizzard Deposition Before the Register, Box 329, HPUAL.

²⁹Dorothy S. Hubbell Oral History, March 1973.

³⁰See J. L. Hubbell Tax Assessment Lists, 1902 and from 1906 for each year to 1939, Box 128, HPUAL.

³¹See Tax Assessment Lists 1915 and thereafter; also Map 17, Appendix V.

³²Ganado Ledger Book 1902-1907, 1, 79, 225, and 346, Box 346, HPUAL.

CHAPTER VI

¹S. E. Shoemaker, "Report to the Commissioner of Indian Affairs," March 10, 1900, Van Valkenburgh Papers; H. F. Robinson was superintendent of irrigation for the entire period of planning and construction of Ganado Reservoir and was responsible for much of the planning and work itself; Gregory, The Navajo Country, 110-111.

²A letter written to his son midsummer makes clear he has been gone several weeks and expected to be gone for some time yet. See McKinley County Republican, January 31, 1913 and February 28, 1913 for news of additional trips to Washington. Boxes 18 and 19 of the Frank McNitt Papers, New Mexico State Records Center contain many extracts from Gallup newspapers bearing on the business of Hubbell and other traders.

³Financial Report, Ganado Project for Fiscal Year 1921, Water File HTP.

4. Roosevelt File, WPHTP.

⁵Howard Gorman, Conversation, August 2, 1983; also Chester Hubbard Conversation, August 5, 1983; also note 4, Chapter IV.

^{5a}Herbert Gregory, The Navajo Country 111.

⁶See Proposed Storage System (Map 1) and Table of Areas and Capacities of Ganado Reservoir (Fig. 11) Appendix V.

⁷Annual Report of H. F. Robinson for Fiscal Year 1921, Water File HTP.

⁸Annual Report of H. F. Robinson for Fiscal Year 1921; and Irrigation Data, Ganado Project for Fiscal Year 1921, Water File HTP.

⁹An unsigned letter to the Commissioner of Indian Affairs from the Navajo Agency on December 5, 1922 spells out the locations of the land assigned to Indians. This is also indicated in a Ganado Project map from 1921. Both documents are in Water File HTP. Several of these communications speak of "allotments" or "allottees" which implies that Indians at Ganado may have had land allotted to them under the terms of the Dawes Severalty Act of 1887. This, however, is not the case. The land is "assigned" for use, but not deeded to the residents.

¹⁰S. G. Maus shows up in one or two of the reports from the early 1920s. He, like Eben Taylor and Fred Mortensen, is also remembered by the Hubbard brothers and Mrs. Hubbell.

¹¹According to Arthur Hubbard, his father David, learned to farm while in Grand Junction as a youth. It is possible he may have been among Navajo men who worked for Colorado beet farmers, or more likely, that he was one of a group of Navajo children taken very much against the will of their parents to Grand Junction for educational purposes. Conversation, August 25, 1983.

¹²Arthur Hubbell is of the opinion that this grower's association represented the first step toward the Ganado Chapter of modern times. Conversation, August 25, 1983.

¹³Correspondence with Marcus Smith, Carl Hayden, and Henry Ashurst was apparently frequent. They kept Hubbell informed about the general prospects of the reservoir and responded to letters from him asking for special attention to a variety of questions. See Ashurst File, Box 51; Hayden File, Box 38; and Smith File, Box 76, HPUAL.

- ¹⁴Unsigned letter to the Commissioner, Water File, HTP.
- ¹⁵Arthur Hubbard Conversation, August 25, 1983.
- ¹⁶H. F. Robinson to W. M. Reed, Chief Engineer, Washington, December 17, 1923, Water File, HTP.
- ¹⁷This showed up in my conversations with both Arthur and Chester Hubbard and with Howard Gorman.
- ¹⁸Unsigned letter to the Commissioner, Water File, HTP.
- ¹⁹In 1973 Dorothy Hubbell listed twenty-two trading posts that Hubbells had operated at one time or other. There is no evidence as to what period each of them was under Hubbell management. Dorothy S. Hubbell, Oral History, August 1973.

CHAPTER VII

- ¹The Hubbells did a major business in sheep and goats traded in lots of one to fifty as part of the regular trade at the store. They also traveled the reservation buying sheep. As result they sometimes did an annual business numbering as many sheep as 10,000 or more. If I have read the record correctly, 1889 may well have approached an all time high. See Ledger Book 1889, Box 327, HPUAL.
- ²For an example see item 2 under date of June 1936, Box 391, HPUAL.
- ³For an example see W. Scott Smith to J. L. Hubbell, June 3, 1905, WPHTP.
- ⁴Folder 1, Box 349, HPUAL references shipment of rye, oat, and alfalfa hay. Neither Friday Kinlichinee or Mrs. Hubbell remembers threshing and there is no evidence of either binders or separators in the "junk paradise" south of the corrals.
- ⁵Dorothy Hubbell Conversation, August 16, 1983.
- ⁶Dorothy S. Hubbell Conversation, August 16, 1983 and Oral History, March 1973.

⁷Left to winter without feed, animals starved by the thousands during the bad years. Although the Ft. Defiance agency tried to encourage Indians to supply the agency with meadow grass, and Herbert Gregory related that some Indians baled "hay for market by pressing it into holes in the ground and tying [it] with yucca or willow withes," in the early years of this century, agency horses, like Indian horses, often fared badly, some becoming so weak in the late winter they could scarcely walk much less be ridden. Gregory, The Navajo Country 28.

⁹No date is on this letter, but it is probably 1904. See BIA 1880-1932 Folder, WPHTP.

¹⁰H. H. Miller to J. L. Hubbell, BIA 1880-1932 Folder, WPHTP; and Folder 1, Box 349, HPUAL.

¹¹Folder 1, Box 245, HPUAL.

¹²Folder 2, Box 391, HPUAL.

¹³Box 42, HPUAL.

¹⁴For example twenty-six truck loads amounting to about 180 tons were received at Ganado, Oraibi, and Pinon between September 24, 1934 and January 5, 1935 from the Arizona Farmers' Exchange at Mesa. Box 129, HPUAL.

¹⁵S. E. Day to J. L. Hubbell from Chinlee, October 14, 1903 informing him "the Hay baler is worth \$75" and offering to "deliver it and show you how to run it--I mean we will start it." Day Folder, Box 23, HPUAL.

¹⁶International Harvester Company to J. L. Hubbell, January 23, 1907 informs him that a "No. 3 Return Apron Spreader with steel wheels" will be shipped to him promptly. WPHTP.

¹⁷Hubbell Tax Assessment Lists, 1902-1915, HPUAL.

¹⁸Farm Account August 1, 1939 to February 29, 1940, Item 1, Box 403, HPUAL: Dorothy S. Hubbell Conversation, August 16, 1983 and Dorothy S. Hubbell Oral History, March 1973; Kinlichinee, Gorman, and Chester Hubbard Conversations.

¹⁹Friday Kinlichinee Conversation, August 16, 1983 dealt at length with handling hay. Photograph HTP-PM-30 shows a crawler type tractor and dates it around 1925. Mrs. Hubbell recalls an early tractor, although she does not differentiate between tracks and wheels, Oral History, March 1973; Photograph HTP-PH6-58 showing haystacks and a hay derrick

is dated 1910 which must be in error because what appears to be a 1920-1925 vintage automobile is visible in the picture.

²⁰ See letters to J. L. Hubbell, WPHTP.

²¹ Dorothy S. Hubbell, Conversation, August 16, 1983; and Friday Kinlichinee Conversation, August 3, 1983.

²² Friday Kinlichinee Conversation, August 3, 1983.

²³ Arthur Hubbard Conversation, August 25, 1983.

²⁴ Dorothy S. Hubbell Oral History, March 1973 mentions peafowl and guinea hens as well.

APPENDIX I

WATER RIGHTS AGREEMENT WITH
THE DEPARTMENT OF THE INTERIOR

1913

WHEREAS, J. L. Hubbell, of Ganado, Apache County, Arizona, is the owner of the following described land, to wit:

S1/2 of SW 1/4, Sec. 27, NE1/4 Sec. 38, and NW1/4 of NW1/4 of Sec. 34, in T. 27 N., R. 26 E., Gila and Salt River B. and M., in said county and State, and the said Hubbell has heretofore built a canal or water ditch having its headgate on the south bank of the Rio Pueblo Colorado, at a point approximately 2 1/4 miles distant in a northerly and easterly direction from said land and running thence in a general southerly and westerly direction about 2 1/2 miles, for the purposes of irrigating said land, and has irrigated said land for several seasons and has acquired for said irrigation water rights under the laws of Arizona, and

WHEREAS, the lands adjoining the lands of the said Hubbell is a portion of the Navajo Indian reservation set aside for the use of the Navajo Indians by executive order dated January 6, 1880, and that certain of the lands of the valley of the Rio Pueblo Colorado are susceptible of cultivation when irrigated, and may be irrigated from the said Rio Pueblo Colorado at such times as there is sufficient water flowing in the stream, and there is a certain reservoir site in which it is possible to store the surplus and flood waters of the said stream, and the land can best be served by carrying the water for a portion of the distance in the ditch owned by the said Hubbell, and

WHEREAS, The United States of America proposes to build such reservoir and convey the water to lands on the Navajo Indian Reservation, now, therefore,

THIS AGREEMENT, made and entered into this sixth day of February, 1913, by the United States of America, acting in this behalf by the Assistant Secretary of the Interior, party of the first part, and the said J. L. Hubbell, party of the second part,

WITNESSETH, that for and in consideration of the stipulations of the party of the first part hereinafter contained, the party of the second part has remised, released and quit-claim forever, unto the party of the first part, all that particular canal or water ditch hereinbefore described, and all other ditches, flumes, and other appurtenances heretofore used in the delivery of water to his said above described land, together with all easements or rights of, way for the same, and all his right to the use of water from said Rio Pueblo Colorado for irrigation of said lands.

The party of the second part agrees to perform a proportionate share of the labor, and to pay a proportionate share of the cost of materials and supplies incident to or necessary for the proper operation and maintenance of the Ganado irrigation system of the party of the first part, or, in lieu thereof at the option of the party of the first part, to pay such proportionate charge as may be fixed for the annual maintenance and operation of said system.

In consideration of faithful performance of the preceding stipulations of the party of the second part and of the conveyance of the property hereinbefore mentioned, the party of the first part agrees that the party of the second part shall have the right to sufficient water from said system for the proper irrigation of his above described land, not to exceed two and one-half acre feet of water for each acre of land, and not to exceed four hundred acre feet of water in each year, or so much thereof as shall constitute the proportionate share, per acre from the water supply actually available for the lands under the project.

It is mutually understood and agreed that, in the performance of labor or the use of material and supplies, or the fixing of the annual charge for maintenance and operation of the system, the users of water therefrom shall contribute as the area of the land of each irrigated is to the total area served thereby.

IN WITNESS WHEREOF, the party of the second part has hereunto set his hand and seal this sixth day of February, 1913, and the party of the first part has caused this agreement to be executed by its duly authorized representatives, this 31st day of May, 1913.

Assistant Secretary of the Interior

APPENDIX II

PAUL BRIZZARD DEPOSITION

BEFORE THE REGISTER AND RECEIVER, UNITED STATES

LAND OFFICE, PHOENIX, ARIZONA

IN THE MATTER OF THE HOMESTEAD)
ENTRY OF JOHN LORENZO HUBBELL,)
NO. 811 F. C. NO. 157)

Territory of Arizona,) : ss.
Maricopa County.)::

Paul Brizzard, first having been duly sworn, upon his oath deposes and says that he is a resident of Phoenix, in Maricopa County, Arizona, and that he is well acquainted with John Lorenzo Hubbell and with the land embraced in his homestead entry No. 811; that he has visited said land and is familiar with the improvements thereon and with the developments that have been made; that affiant knows of his own knowledge that the store upon said land and the warehouse connected therewith are used exclusively by Mr. Hubbell in carrying on his trade with the Navajo Indians; that Mr. Hubbell in carrying on said trade purchases from said Indians wool, pelts, silverware and Navajo blankets and sells to the Indians such general merchandise as they desire; that he disposes of the articles and products he purchases from said Indians in the markets and to any one who desires to purchase such things; that Mr. Hubbell is the exclusive owner of said store and warehouse and of the business conducted therein. That the blacksmith shop upon said tract is used exclusively by him and his employees as a convenience in carrying on said farm and store; that there is no blacksmith employed therein but that the tools and appliances therein are used only by Mr. Hubbell's employees for their own private convenience; that Mr. Hubbell has constructed an irrigating ditch about two and one-half miles in length from Pueblo Colorado Creek to a reservoir covering about five acres, and that from this reservoir he has built laterals, by means of which he is able to irrigate every part of his farm, consisting of about one hundred and forty acres; that he has upon said farm an orchard and vineyard and raises crops of rye, alfalfa and garden truck generally; that in the judgment of affiant said irrigating system must have cost about fifteen thousand dollars and that the leveling and planting of said farm must have cost about ten thousand dollars more; that said irrigating ditch is substantial and well built, being upon an average five feet wide at the bottom and about seven feet wide at the top.

Affiant further says that all of the buildings upon said tract of land are owned and occupied exclusively by Mr. Hubbell and his employees and not by any other person or persons, and that none of said buildings are leased or rented for any purpose or to any person whomsoever.

Subscribed in my presence and sworn to before me this ___ day of April,
1908.

APPENDIX III

E. S. CLARK DEPOSITION

BEFORE THE REGISTER AND RECEIVER, UNITED STATES

LAND OFFICE, PHOENIX, ARIZONA.

IN THE MATTER OF THE HOMESTEAD)
ENTRY OF JOHN LORENZO HUBBELL,)
NO. 811 F. C. NO. 157.)

Territory of Arizona,)
: ss.
Maricopa County.)

E. S. Clark, first having been duly sworn, upon his oath deposes and says that he has resided in the Territory of Arizona since the year 1882 and that he has known John Lorenzo Hubbell and the land embraced in his homestead entry No. 811, situated at Ganado, Arizona, ever since said date; that when he first visited said tract in 1882 Mr. Hubbell was living there and had made extensive improvements thereon, consisting of a dwelling house, store building, warehouse, stable, wells, enclosures and other improvements of a substantial nature; that at that time Mr. Hubbell was carrying on a trading business with the Navajo Indians at said place and he has carried on said business ever since, to affiant's personal knowledge, and exclusively in his own name and right, excepting during a period of about ten years, from 1885 until about 1895 or 1896, when Mr. C. N. Cotton was associated with him. That during all of said time since 1882 Mr. Hubbell has used and occupied said place and the buildings thereon for himself and his employees exclusively. Affiant has also known and is familiar with the manner in which Mr. Hubbell has dealt with the Indians at his said store and knows that his treatment of them has been fair and liberal and that he is held in high esteem and friendship by all of the Indians with whom he has come in contact and that Mr. Hubbell's reputation all over Arizona as a business man and a citizen is of the very best.

Subscribed in my presence and sworn to before me this ___
day of April 1908.

APPENDIX IV

MATHEW HOWELL DEPOSITION
1908

BEFORE THE REGISTER AND RECEIVER, UNITED STATES
LAND OFFICE, PHOENIX, ARIZONA.

IN THE MATTER OF THE HOMESTEAD)
ENTRY OF JOHN LORENZO HUBBELL,)
NO. 811 F. C. NO. 157.)

Territory of Arizona,)
: ss.
County of Maricopa.)

Mathew Howell, first having been duly sworn, upon his oath deposes and says that his legal residence is in Long Beach, California, but that he is now and for many years last past has been a great deal in Arizona; that he is well acquainted with John Lorenzo Hubbell, who made homestead entry No. 811, and with the land embraced in his claim; that he first visited said land about ten years ago, although he has known the claimant, John Lorenzo Hubbell, for many years prior to that time; that affiant is acquainted with the improvements upon said land, which consist generally of a dwelling house, store building and warehouse, stable, employees' buildings, blacksmith shop and out-buildings generally; that all of said buildings are substantial and well kept and must have cost a great deal of money; that Mr. Hubbell has established an irrigating system upon said land and has thereby brought under cultivation about one hundred and forty acres of land, upon which he has an orchard and vineyard and raises crops of rye and alfalfa; that said irrigating system consists of a main irrigating ditch about two and one-half miles in length, terminating in a reservoir, through which all of said land is irrigated by means of laterals. This irrigation system has been gradually developed during the last five years.

Affiant is familiar with the business conducted by Mr. Hubbell upon said tract of land and knows that it consists of trade with the Navajo Indians in wool, pelts, silver-ware, blankets, etc., which he has carried on during the period of at least ten years past; that affiant would estimate the volume of business done by Mr. Hubbell during the last year at about eighty thousand dollars; that the warehouse is used only by Mr. Hubbell in conducting said store, and not otherwise, and affiant knows that no one except Mr. Hubbell is interested in or has any control or management over said business; that the blacksmith shop upon said land is a private institution and is used only as a convenience to Mr. Hubbell and his employees in carrying on the store and farm and that no public work is done there; that all of the buildings upon said tract are used and

occupied by Mr. Hubbell and his employees exclusively and that none of said buildings or any part of said land is rented or leased.

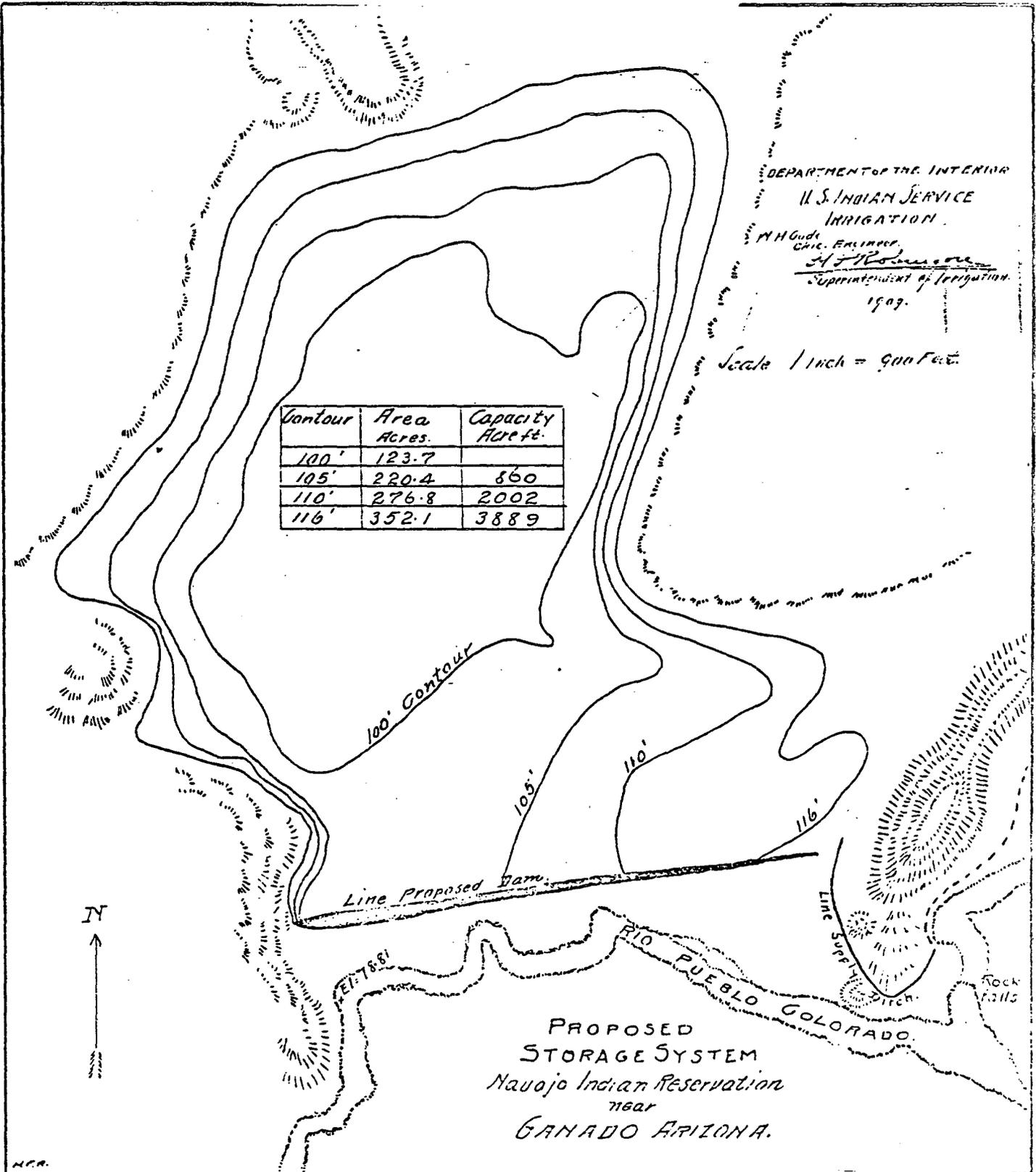
Affiant states that he has frequently bought goods from Mr. Hubbell and has paid him for them and no one else, and that he has sold goods to Mr. Hubbell, who has paid for them himself, and that no one else has had any interest or connection with said transactions, or any of them, and affiant knows him to be the sole owner of said store and farm.

Affiant further says that Mr. Hubbell is a man of the highest reputation and character and is known everywhere in the Territory of Arizona for his integrity as a citizen and a business man and that his treatment of the Navajo Indians has always been fair and liberal and that he is highly esteemed by the Indians upon the reservation who know him.

APPENDIX V

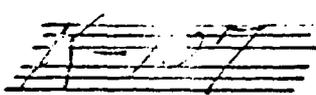
U. S. INDIAN SERVICE IRRIGATION, GANADO PROJECT

SUNDRY MAPS, PLANS & DATA



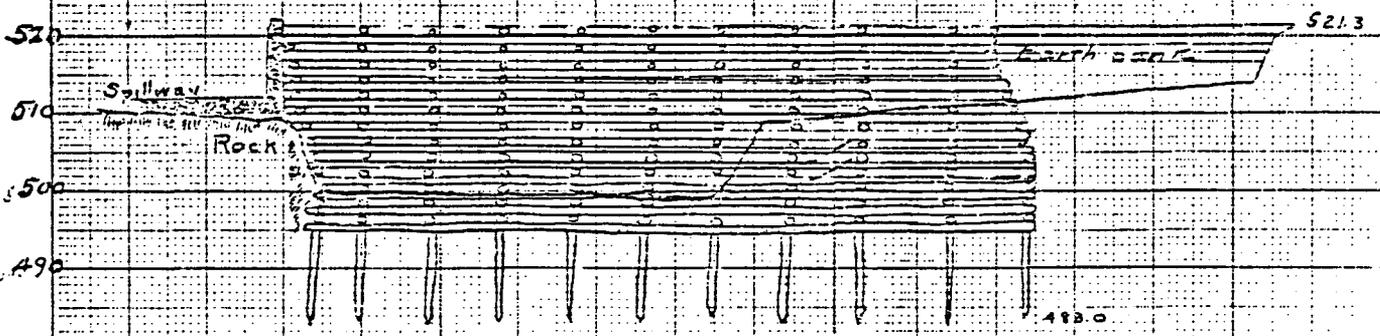
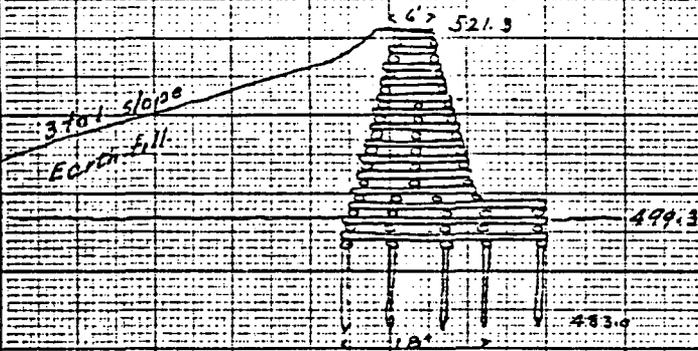
DEPARTMENT OF THE INTERIOR
 U. S. INDIAN SERVICE
 IRRIGATION
 M. H. Gault,
 CHIEF ENGINEER,
H. F. Robinson
 Superintendent of Irrigation.
 1909.

Scale 1 inch = 900 Feet.



M 6
 F. AG

DIVERSION DAM
GANADO PROJECT
ARIZONA
1913.



Department of the Interior
U.S. Indian Irrigation Service

W.M. REED CHIEF ENGINEER
H.F. Robinson Supt. Irrigation

M. 341
F-42 8

LAYOUT OF
DIVERSION
WORKS

GANADO
PROJECT

ARIZONA
1913.

1" = 100'

400' of Rock & Brush riprap

Department of the Interior
U.S. Indian Irrigation Service.
W.M. REED CHIEF ENGINEER.
H.F. Robinson Supt. Irrigation.

Earth fill
crib dam.

Spillway
Length 97'

110' dry wall

25' dry wall

Canal

Top of Earth slope

Solid Rock.

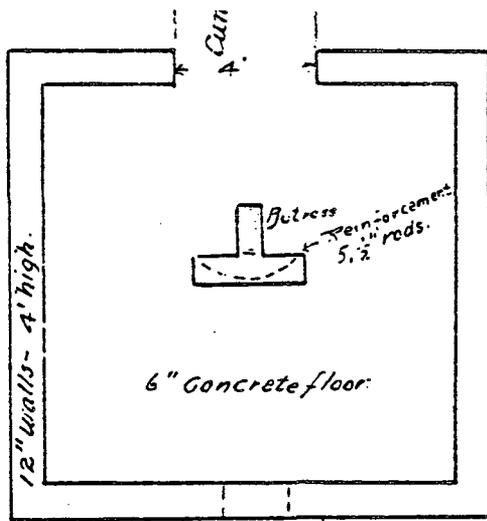
Edge of Rock.

H.F.R. del.

M-357

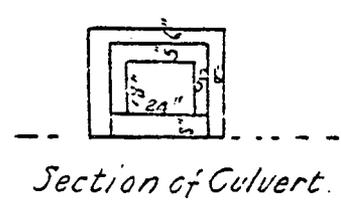
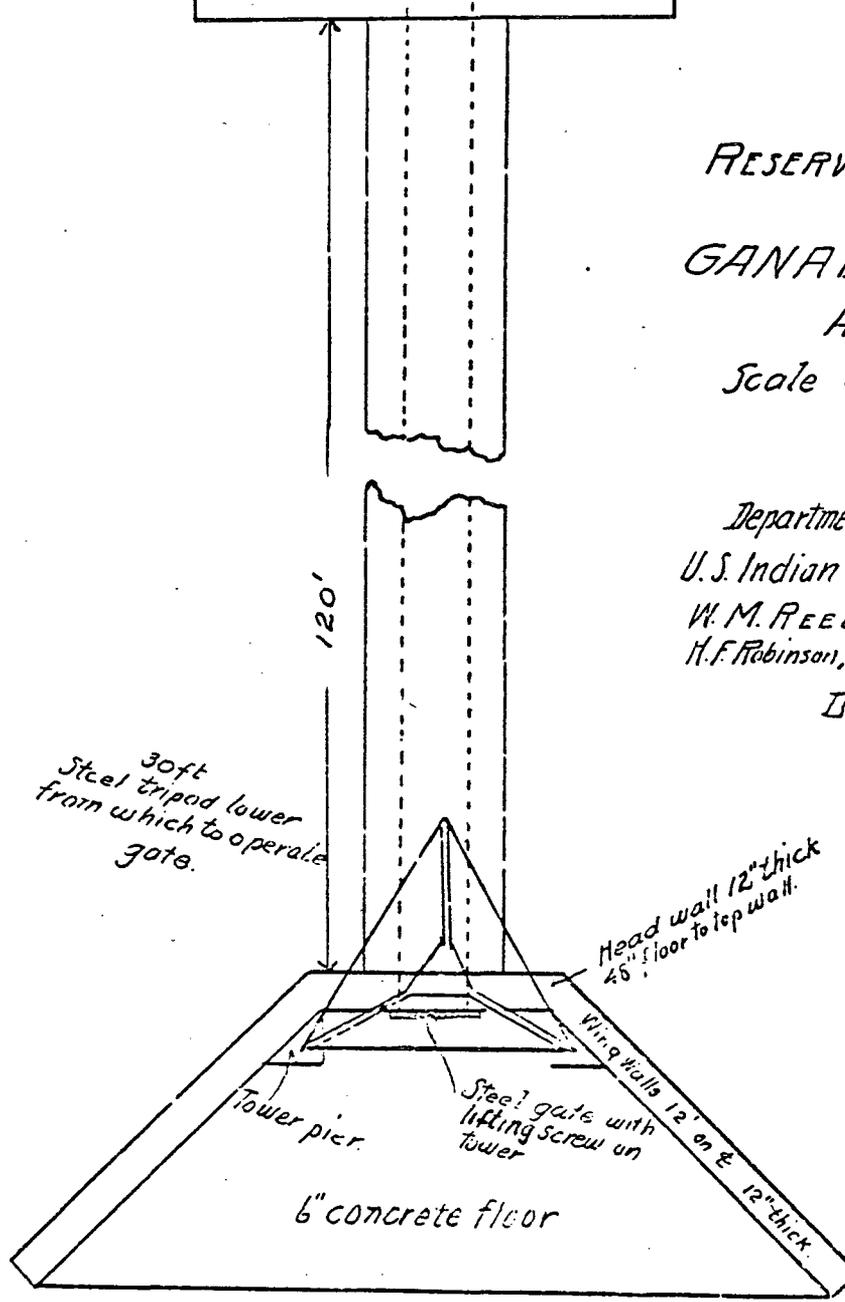
341-

F-1-24
A-1-24

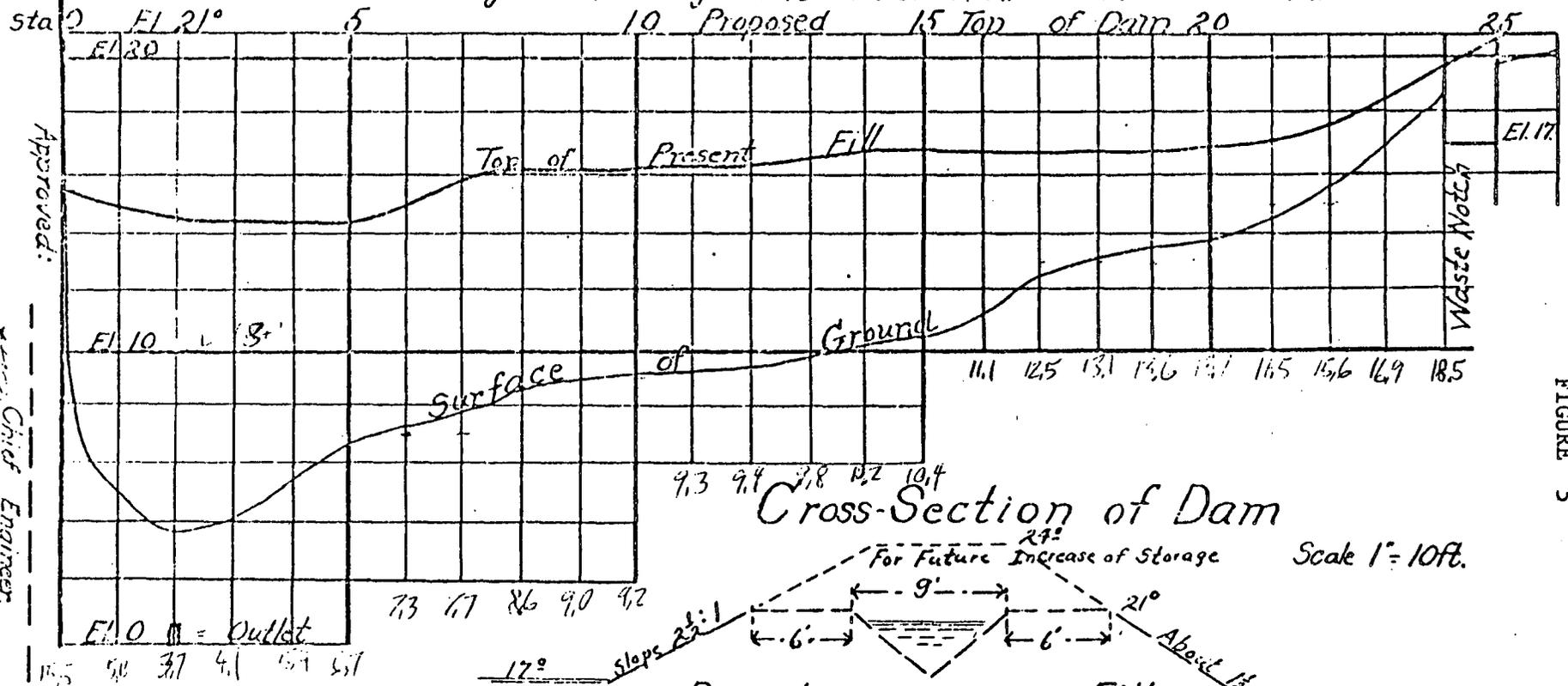


RESERVOIR OUTLET
 GANADO PROJECT.
 ARIZONA.
 Scale 6' to 1 inch.

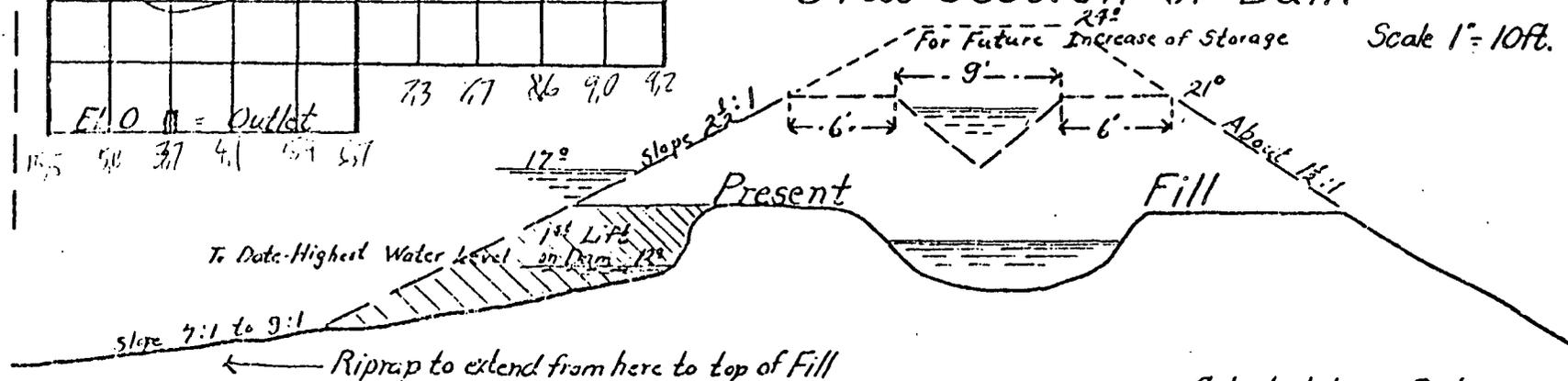
Department of the Interior
 U.S. Indian Irrigation Service.
 W. M. REED, CHIEF ENGINEER.
 H. F. Robinson, Supt of Irrigation.
 Dec. 1913.



Ganado Project Navajo Reservation - Profile of Axis of Dam.



Cross-Section of Dam



DEPARTMENT OF THE INTERIOR
U.S. INDIAN IRRIGATION SERVICE

W. M. Reed

Chief Engineer

H. F. Robinson

Supt of Irrigation

Pools below Lower toe of fill
to keep Gophers, rats etc from fill

Culverts between Pools.

Roadways

Old Burrow Pit

RR. D.1 Ganado, Arizona 8/11/16

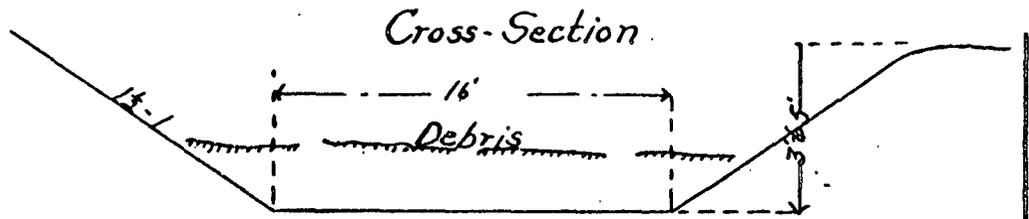
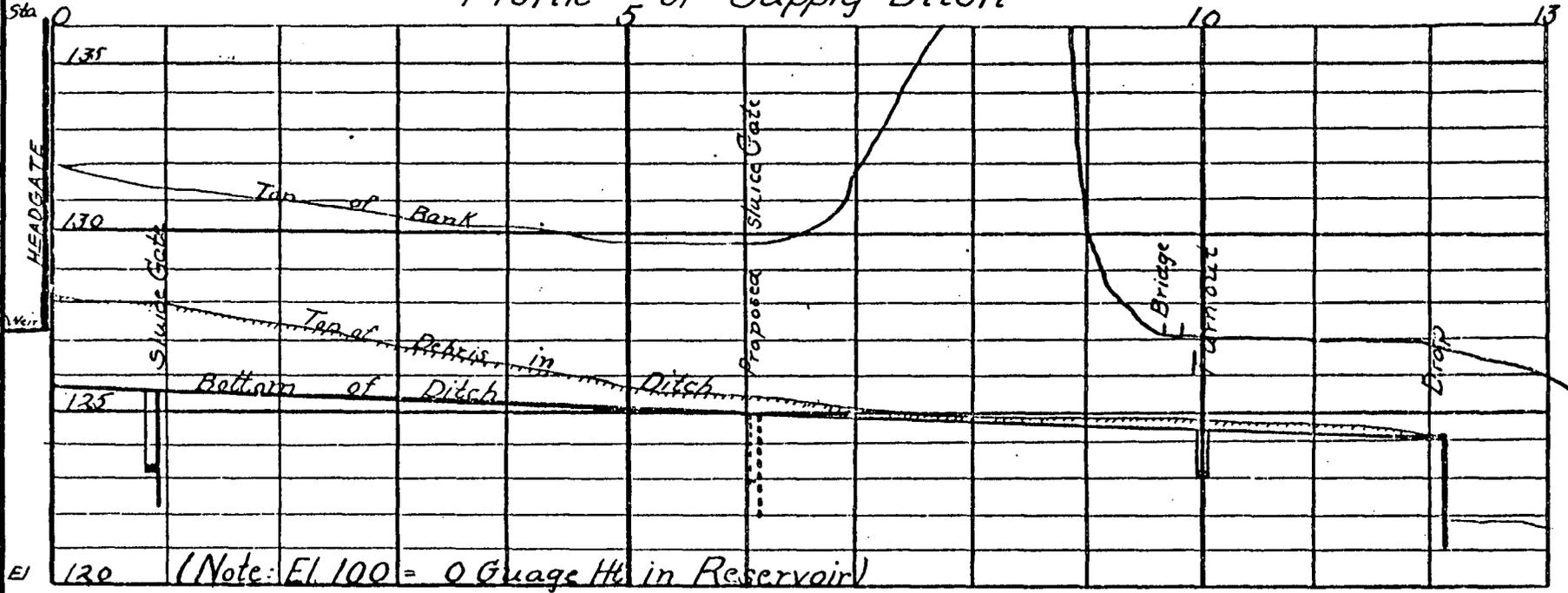
To accompany Report & Plans Extension of Work - Ganado Project.

Approved:

Chief Engineer

Supt of Irrigation

Profile of Supply Ditch



To accompany Report & Plans "Extension of Work" Ganado Project

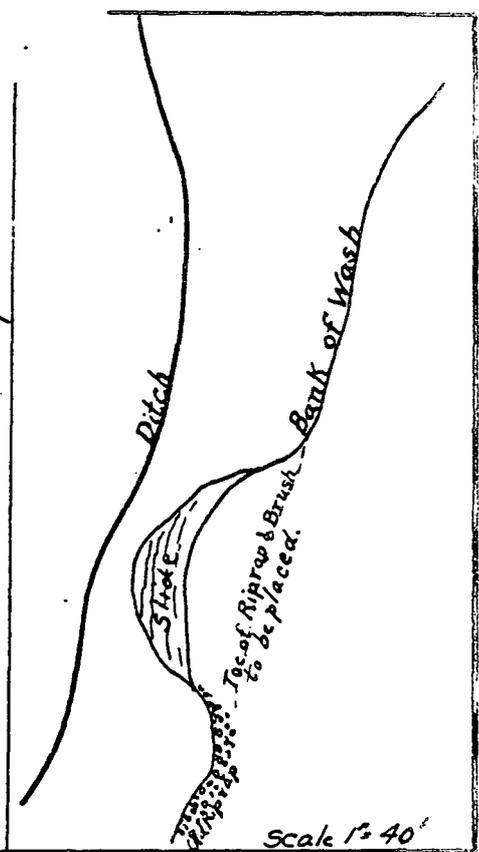
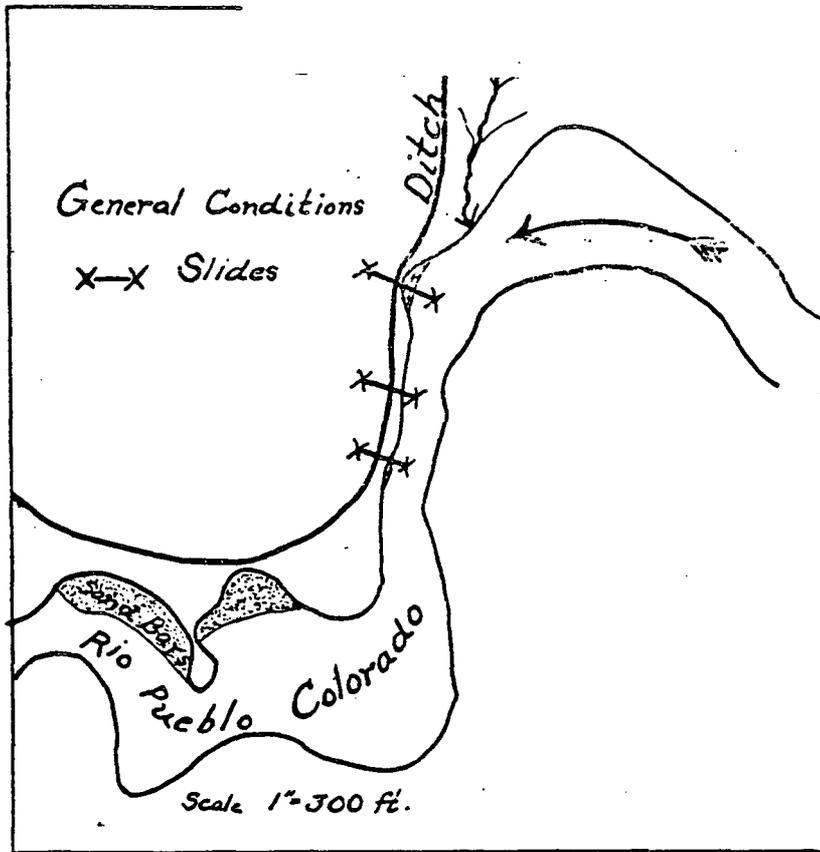
DEPARTMENT OF THE INTERIOR
 U.S. INDIAN IRRIGATION SERVICE
 W.M. Reed Chief Engineer
 H.F. Robinson Supt of Irrigation

Approved: _____
 Chief Engineer.
R.R. Del
 Supt of Irrigation

R.R. Del Ganado Arizona 8/11/16

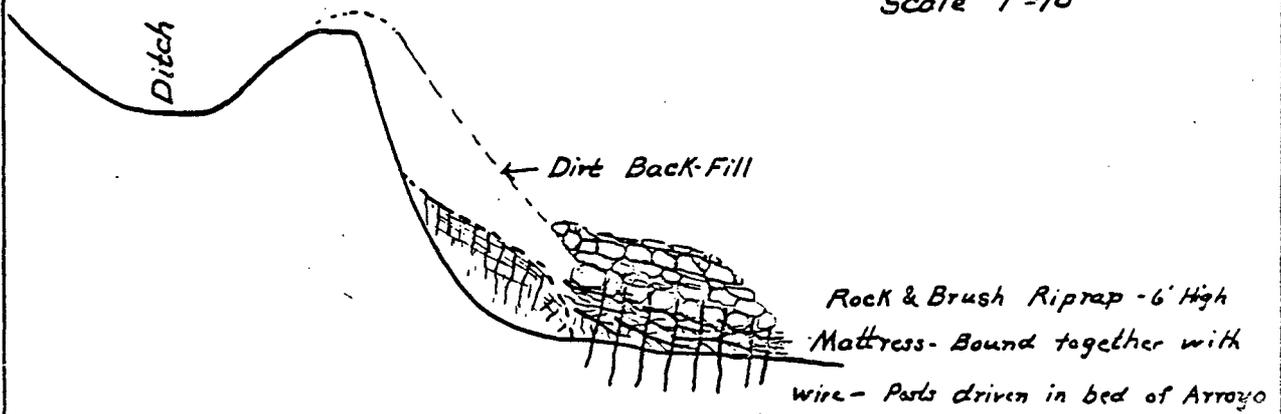
FIGURE 6

Plate "B"



CROSS-SECTION AT SLIDE

Scale 1" = 10'



PROPOSED RIPRAP FOR PROTECTING THE GANADO DITCH

DEPARTMENT OF THE INTERIOR
U.S. INDIAN IRRIGATION SERVICE

W.M. Reed Chief Engineer

H.F. Robinson Supt. of Irrigation

Approved:

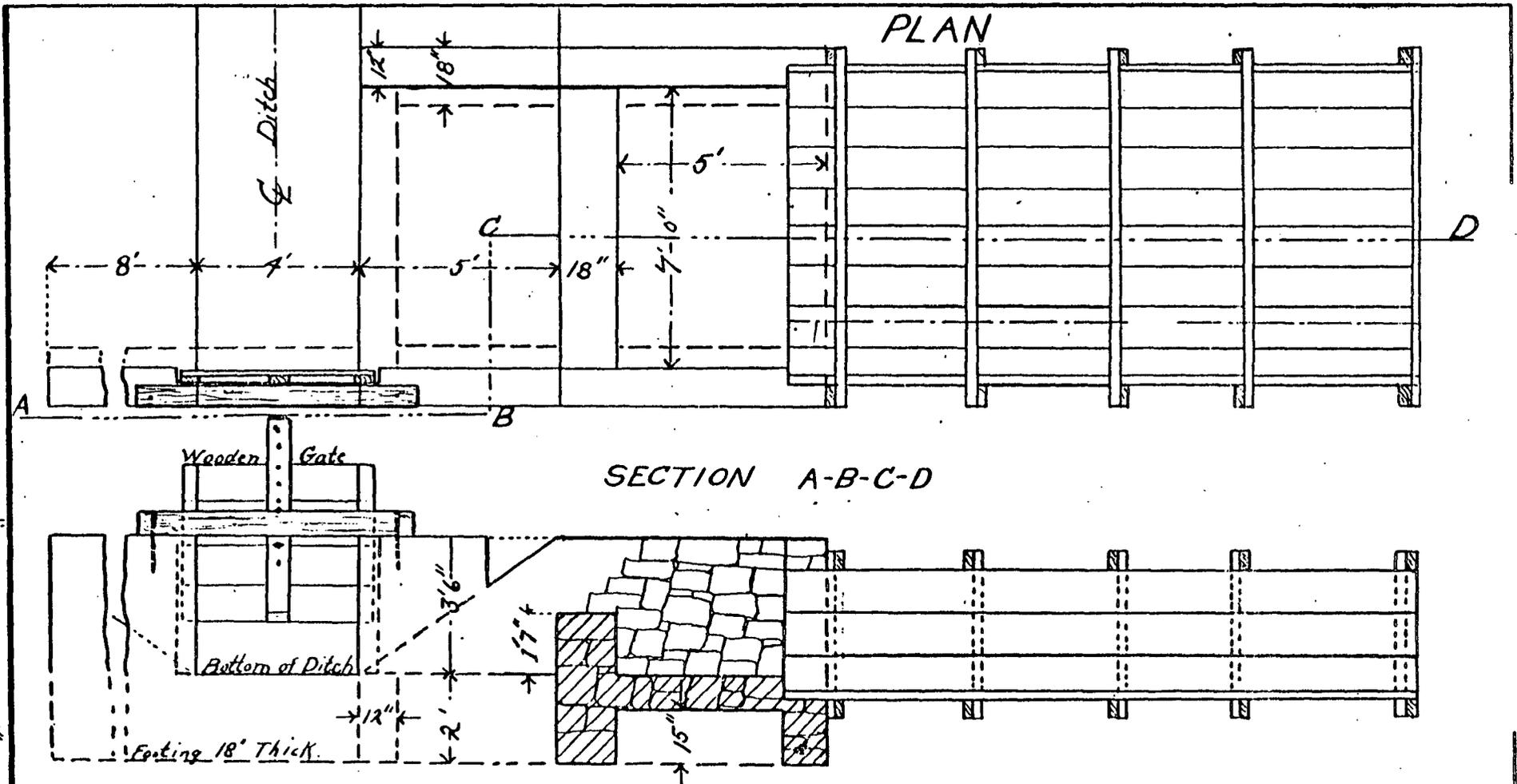
 Chief Engineer
H.F. Robinson
 Supt. of Irrigation

R.R. Del. Ganado Arizona 8/16/16

To accompany Report, Plans etc "Extension of Work" Ganado. Project.

To accompany Report, Plans etc. "Extension of Work"

Ganado Project.



MASONRY SPILLWAY

Scale 1" = 4ft.

DEPARTMENT OF THE INTERIOR
U.S. INDIAN IRRIGATION SERVICE

Approved:

W.M. Reed

Chief Engineer.

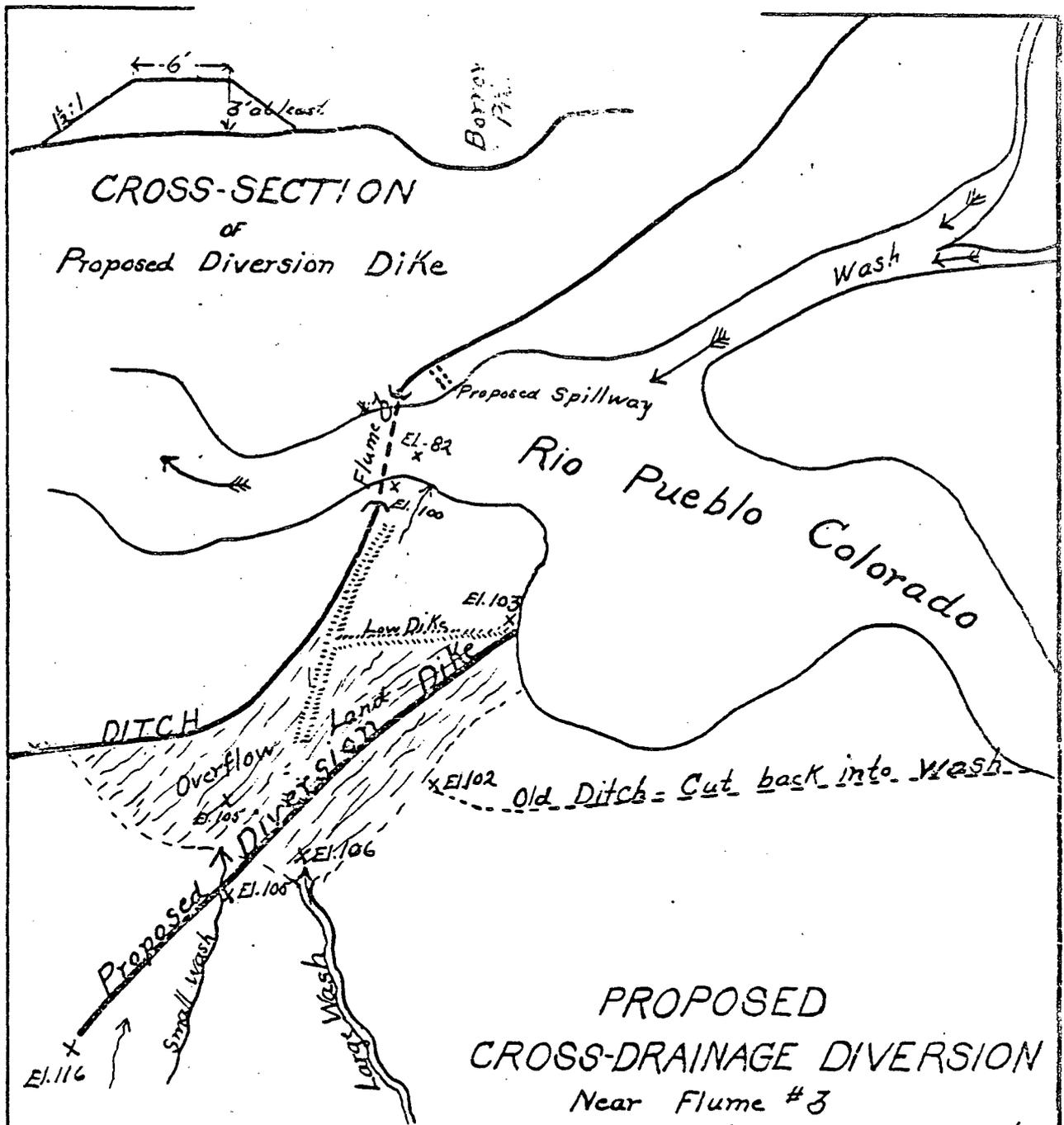
H.F. Robinson

Supt of Irrigation

Chief Engineer
H.F. Robinson
 Supt of Irrigation.

Note: Wooden Chute maybe omitted entirely or it may be supported on a cantilever trestle as the conditions require.

RR. Del. Ganado, Arizona 8/19/16



DEPARTMENT OF THE INTERIOR U.S. INDIAN IRRIGATION SERVICE

W.M. Reed. H.F. Robinson

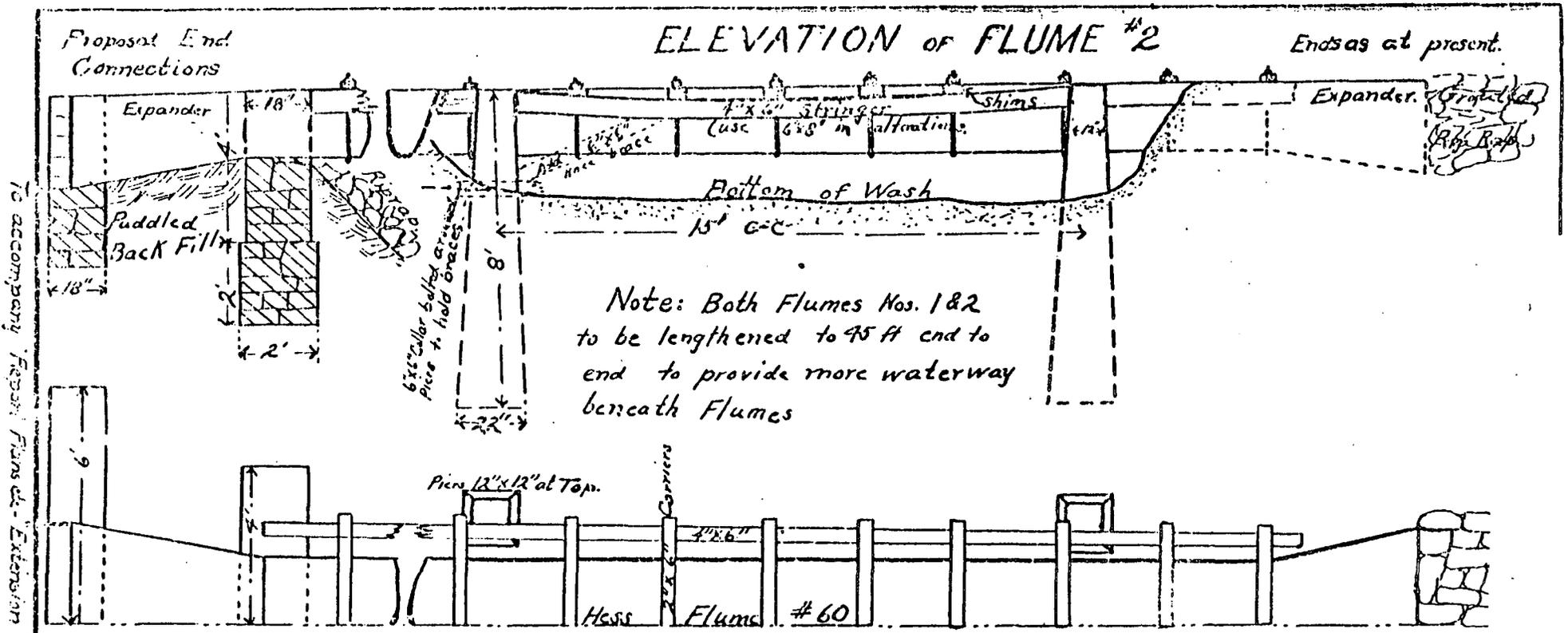
Chief Engineer. Supt of Irrigation

Approved:

Chief Engineer [Signature] Supt of Irrigation

RR Del Ganado Arizona 8/10/16

To accompany Report, Plans etc, "Extension of Work- Ganado Project"



Note: Both Flumes Nos. 1 & 2 to be lengthened to 45 ft end to end to provide more waterway beneath Flumes

PROPOSED ALTERATIONS OF END CONNECTIONS OF FLUMES GANADO PROJECT

DEPARTMENT OF THE INTERIOR
U.S. INDIAN IRRIGATION SERVICE

Approved:

Scale 1" = 4ft.

W. M. Reed

Chief Engineer

H. F. Robinson

Supt of Irrigation.

Chief Engineer
A. Robinson
Supt of Irrigation.

RR Del. Ganado Arizona 8/19/16

To accompany Report Flumes - "Extension of Work" Ganado Project.

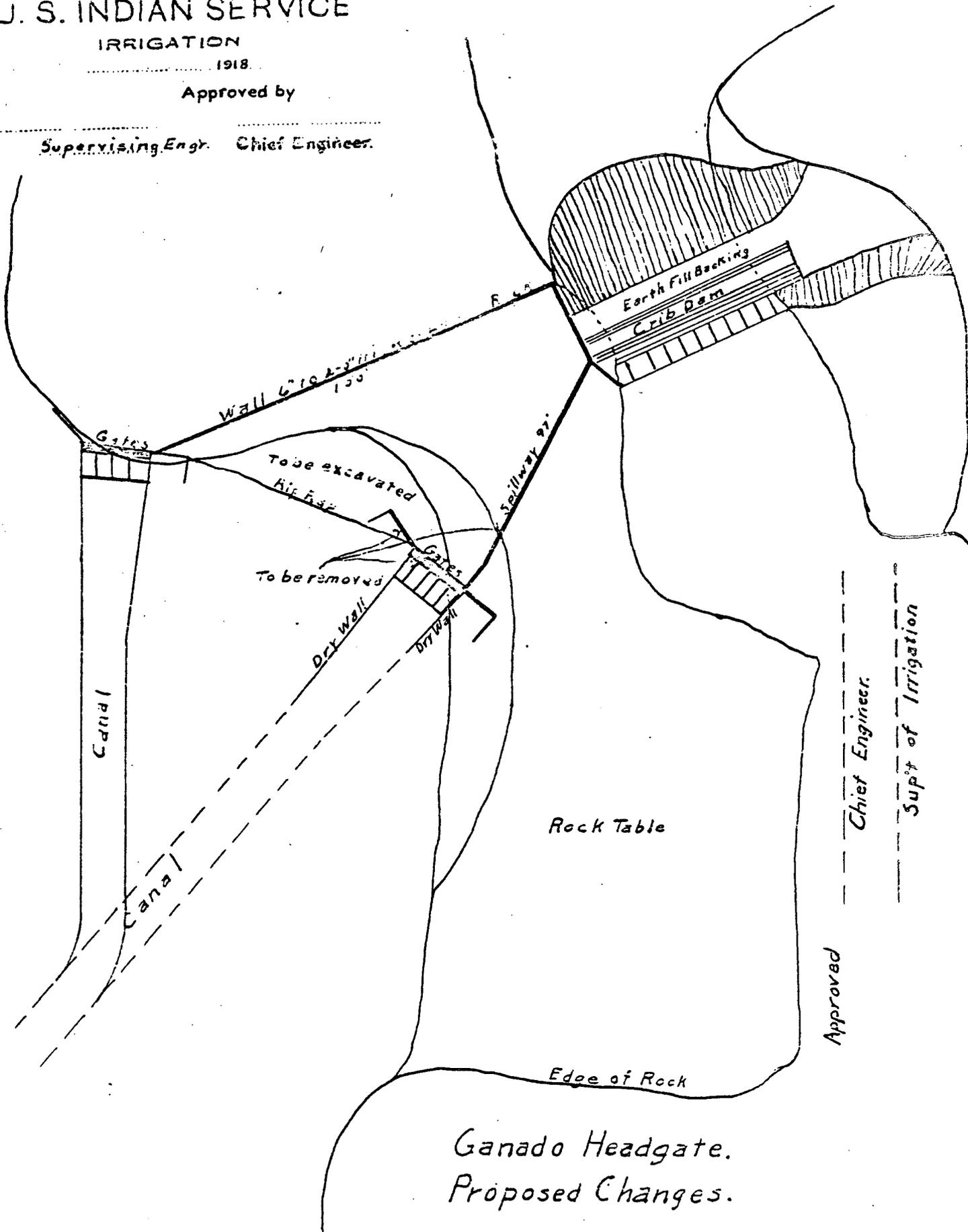
DEPARTMENT OF THE INTERIOR
U. S. INDIAN SERVICE

IRRIGATION

1918

Approved by

Supervising Engr. Chief Engineers.



Approved

Chief Engineer.

Sup't of Irrigation

Ganado Headgate.
Proposed Changes.

June 1918.

DEPARTMENT OF THE
U.S. INDIAN SERVICE

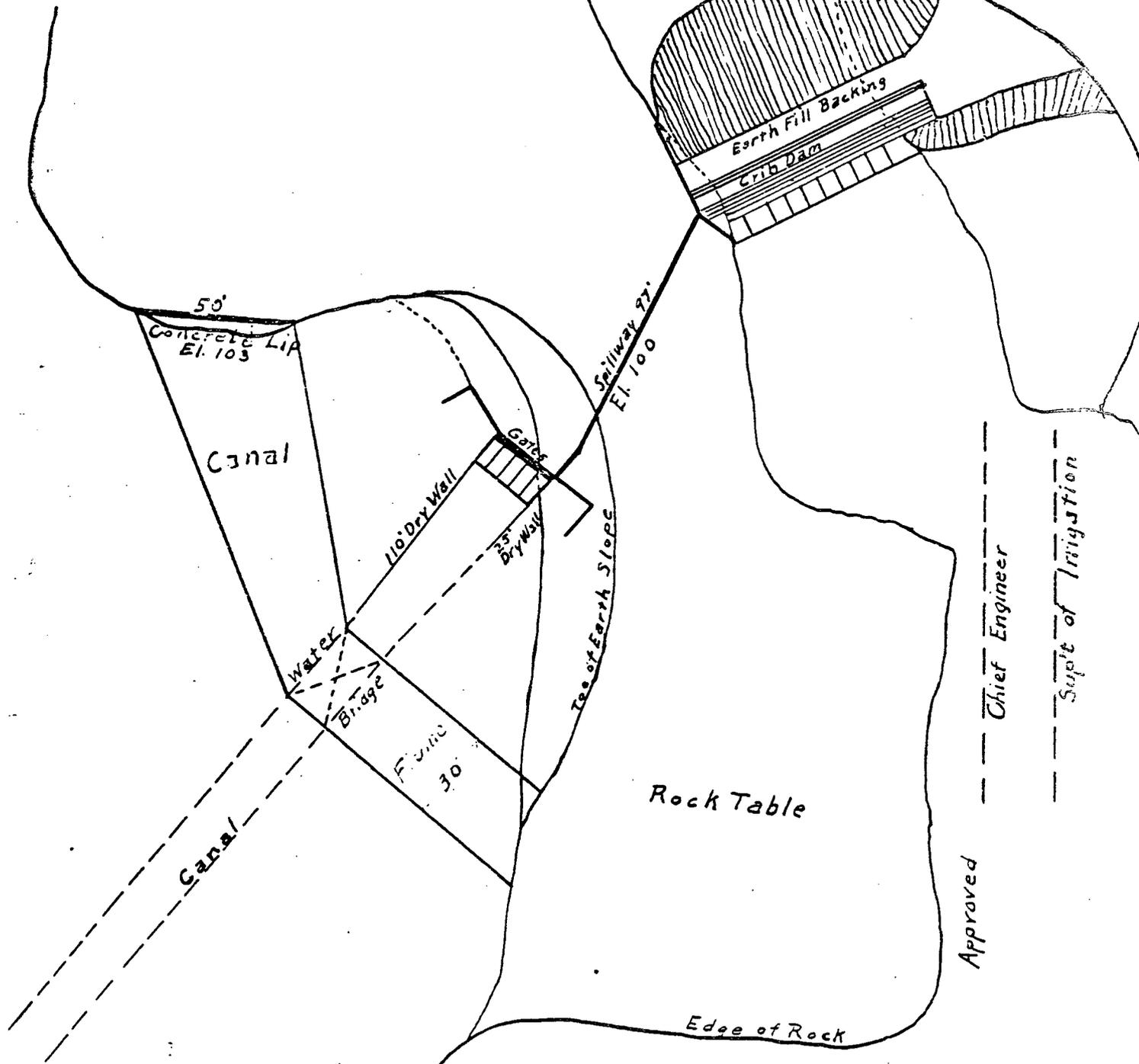
MAP 12

IRRIGATION

1918

Approved by

SUPERVISING ENGR. Chief Engineer.



Present Work in Black.
Proposed Work in Red.

Ganado Headgate
Relief Spillway.

Approved
Chief Engineer
Supt of Irrigation

June, 1918.

DEPARTMENT OF THE INTERIOR
 UNITED STATES INDIAN IRRIGATION SERVICE,
~~SUPERINTENDENT OF IRRIGATION~~

Office of Supervising Engineer.
 Albuquerque, N. M.

Table of Areas and Capacities of Ganado Reservoir.

Gauge Height	Area in Acres	Capacity in Acra Feet,
0	0	0
1	55	25
2	92	75
3	115	220
4	134	325
5	157	475
6	180	630
7	196	825
8	210	1020
9	220	1225
10	230	1450
11	238	1680
12	244	1930
13	256	2170
14	268	2450
15	278	2725
16	292	3000
17	307	3300

TABLE OF AREAS AND CAPACITIES OF CALADO RESERVOIR.

Gauge Height	Areas in Acres	Capacities in Acre Feet
1	0	0
2	0	0
3	52	8
4	123	88
5	179	242
6	217	440
7	237	667
8	259	915
9	276	1182
10	289	1470
11	306	1767
12	316	2078
13	335	2404

Calculated from soundings by S. G. Maus

January 1924.

Ganado Project.

Plan for Sluice section.
to care for sand and silt
Diversion Canal.
Not to Scale.

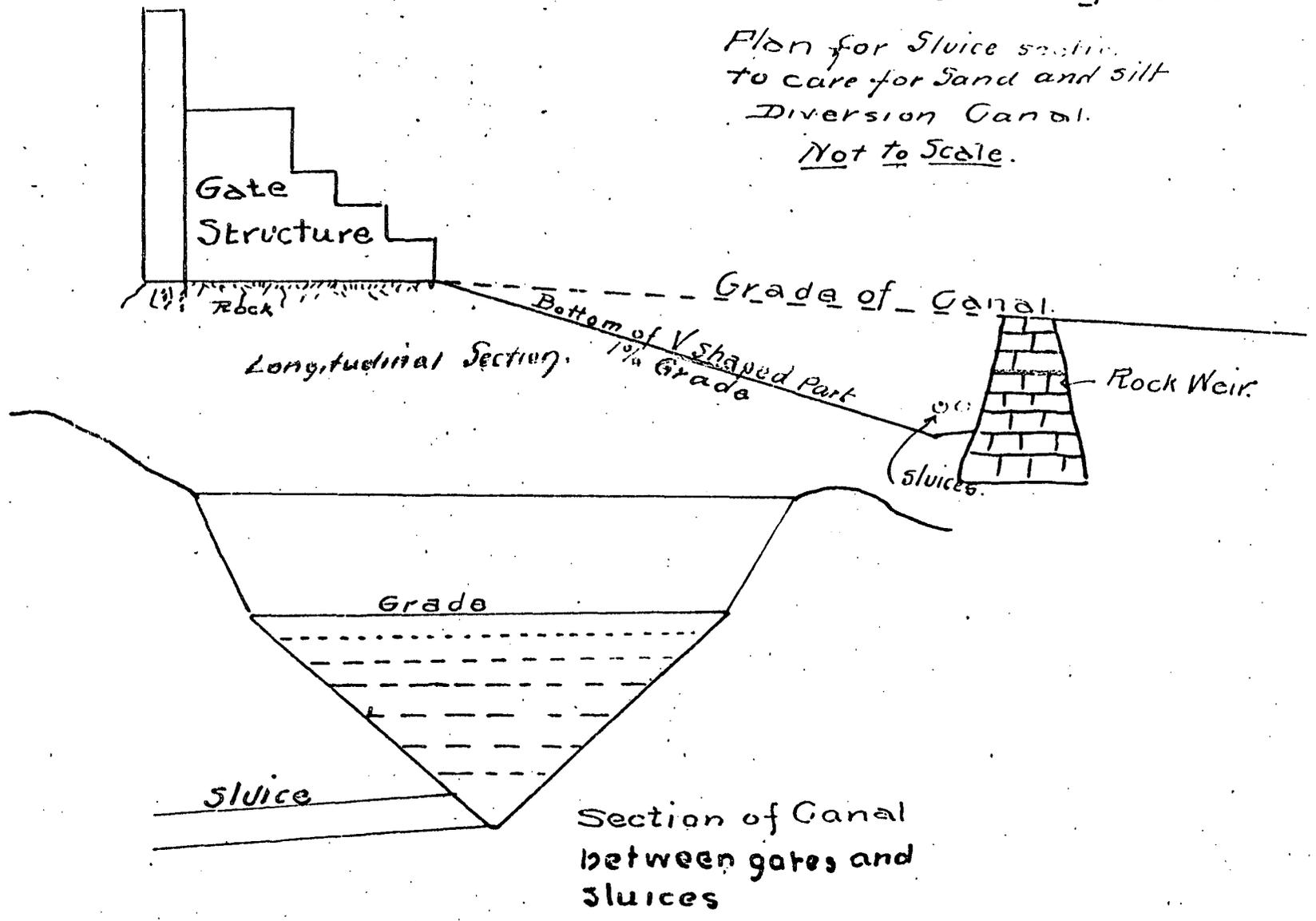


FIGURE 16

18 100 200 300

CAPACITY CURVE

GANADO RESERVOIR

16

14

12

10

8

6

4

2

0

Guage Height - Feet

Capacity

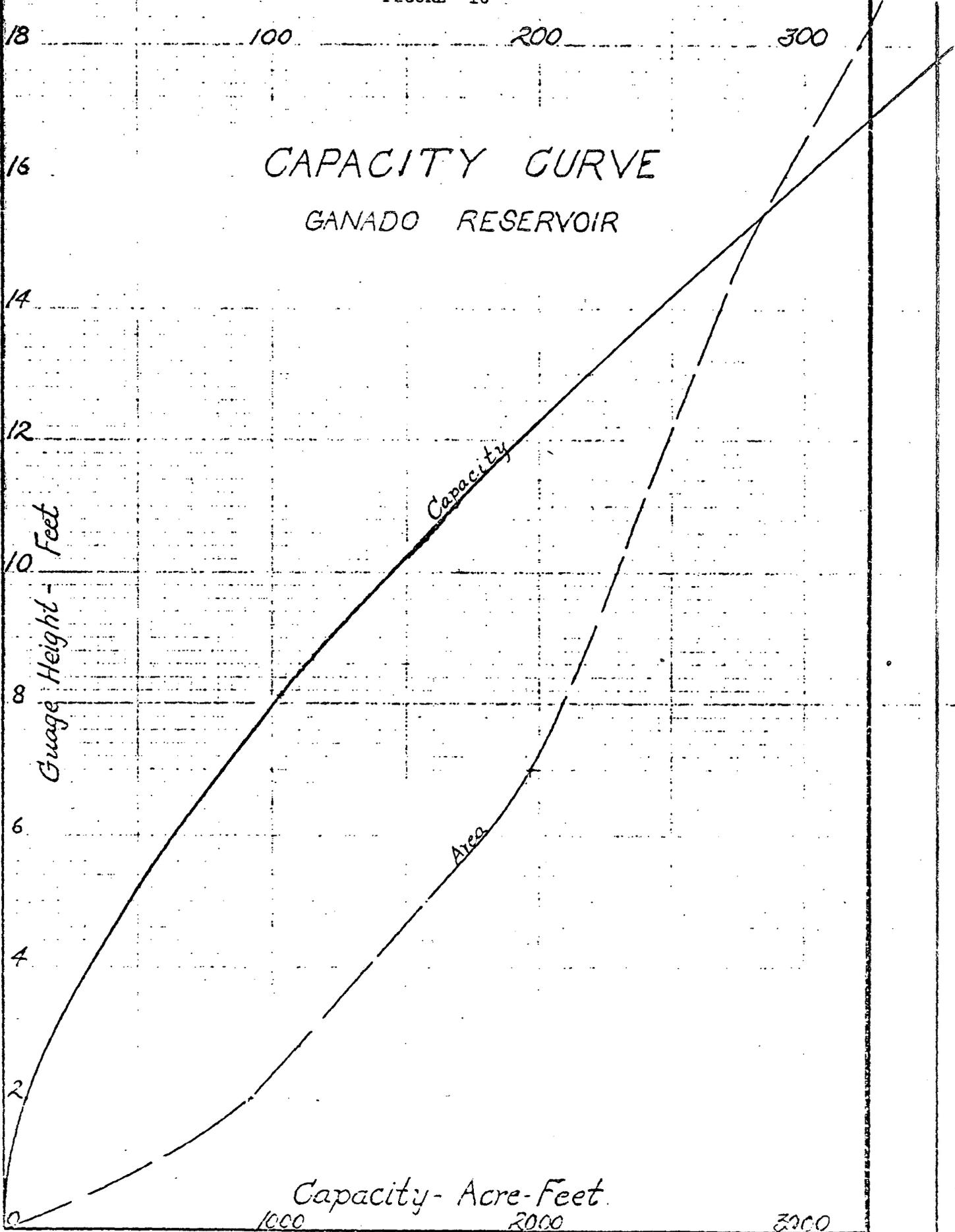
Area

Capacity - Acre-Feet

1000

2000

3000



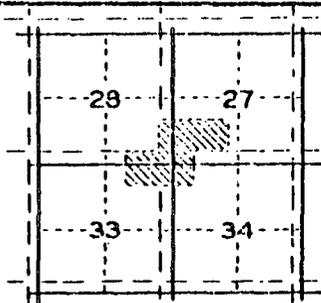
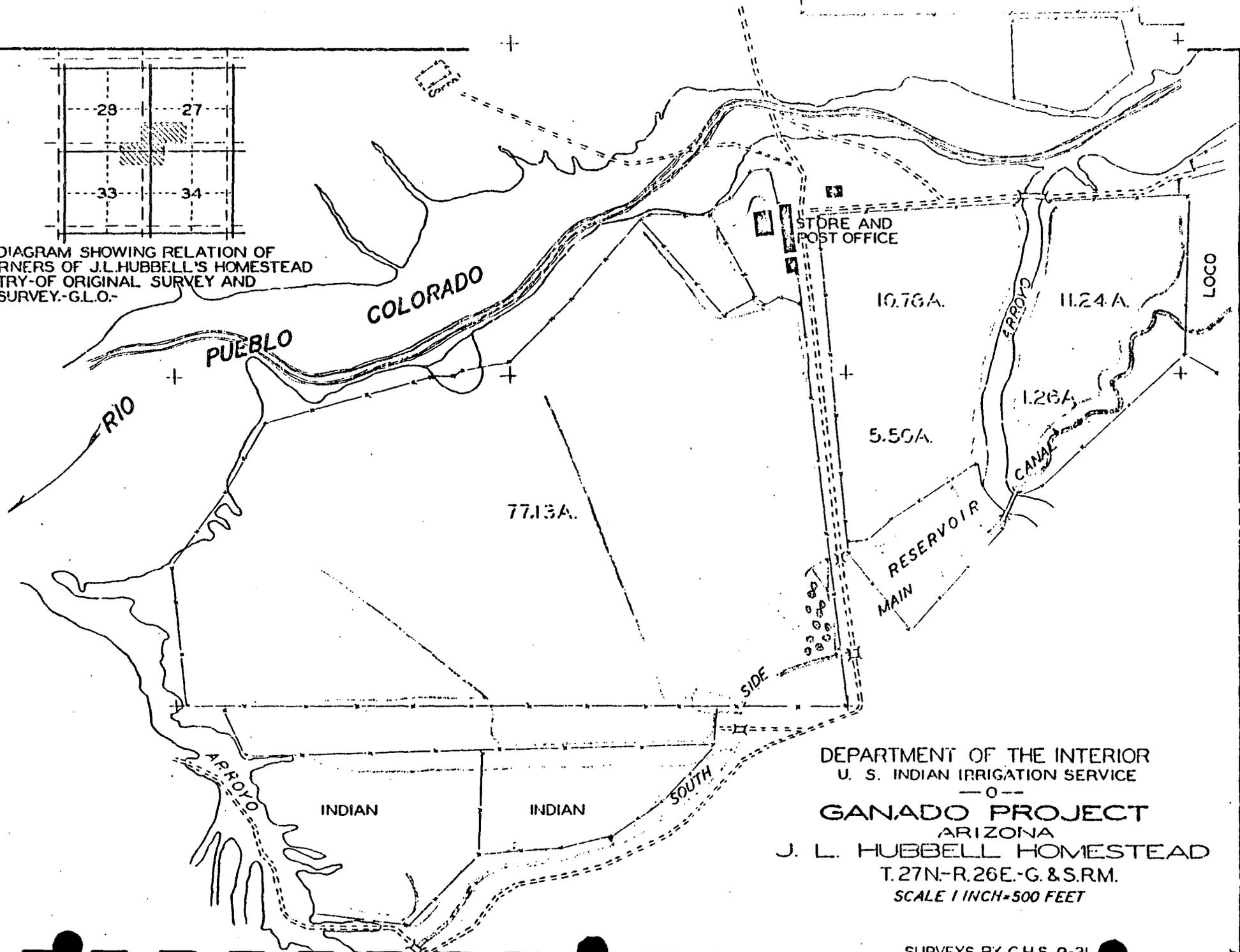


DIAGRAM SHOWING RELATION OF CORNERS OF J.L.HUBBELL'S HOMESTEAD ENTRY-OF ORIGINAL SURVEY AND RESURVEY.-G.L.O.-

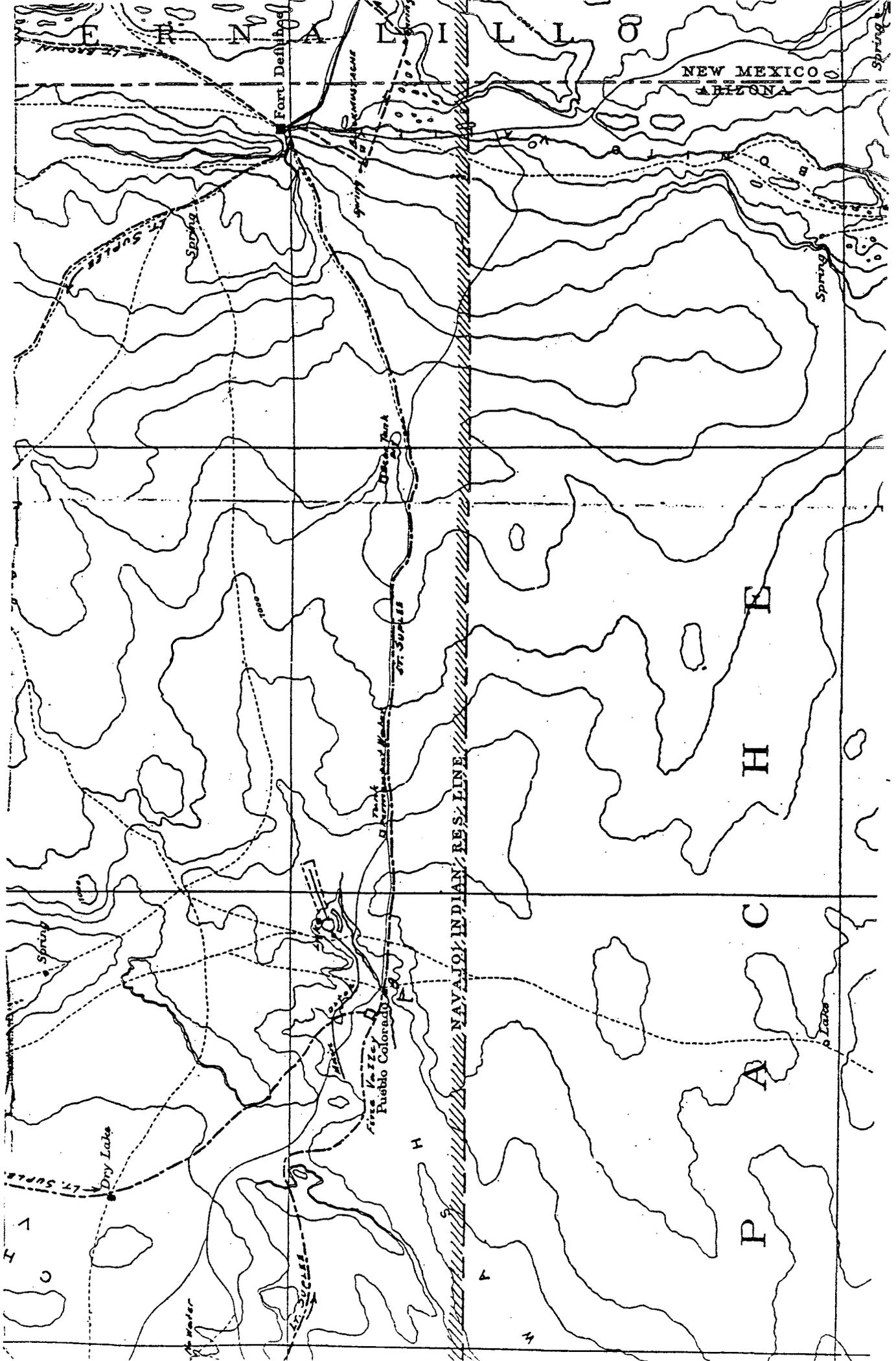


DEPARTMENT OF THE INTERIOR
 U. S. INDIAN IRRIGATION SERVICE
 — 0 —
GANADO PROJECT
 ARIZONA
 J. L. HUBBELL HOMESTEAD
 T.27N-R.26E-G. & S.RM.
 SCALE 1 INCH=500 FEET

APPENDIX VI

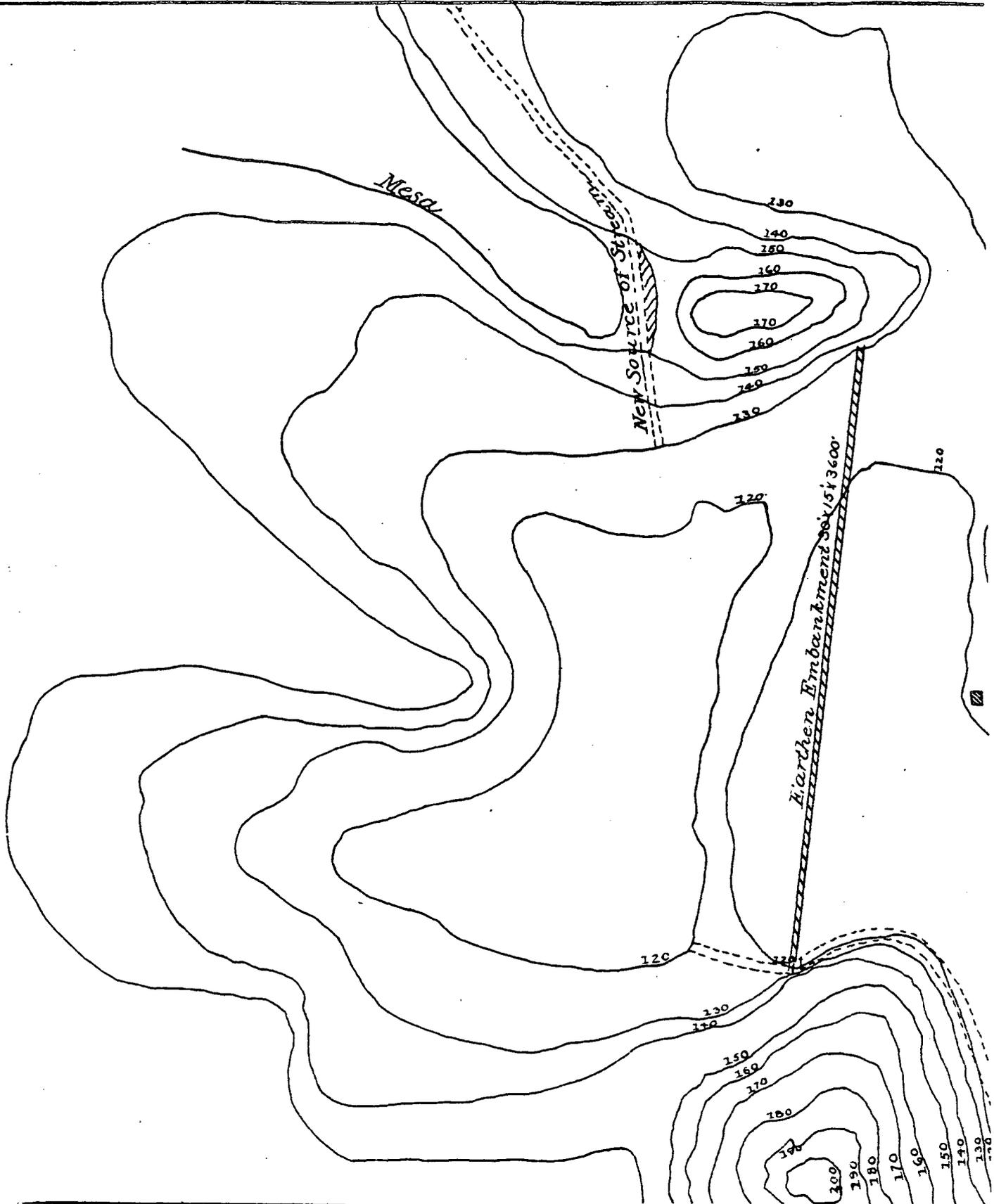
E. M. SUPPLE MAPS OF GANADO LAKE AND RESERVOIR SITE

FROM W. C. BROWN "REPORT" 52ND CONG. 2 SESS., SEN. EXEC. DOC. 68.



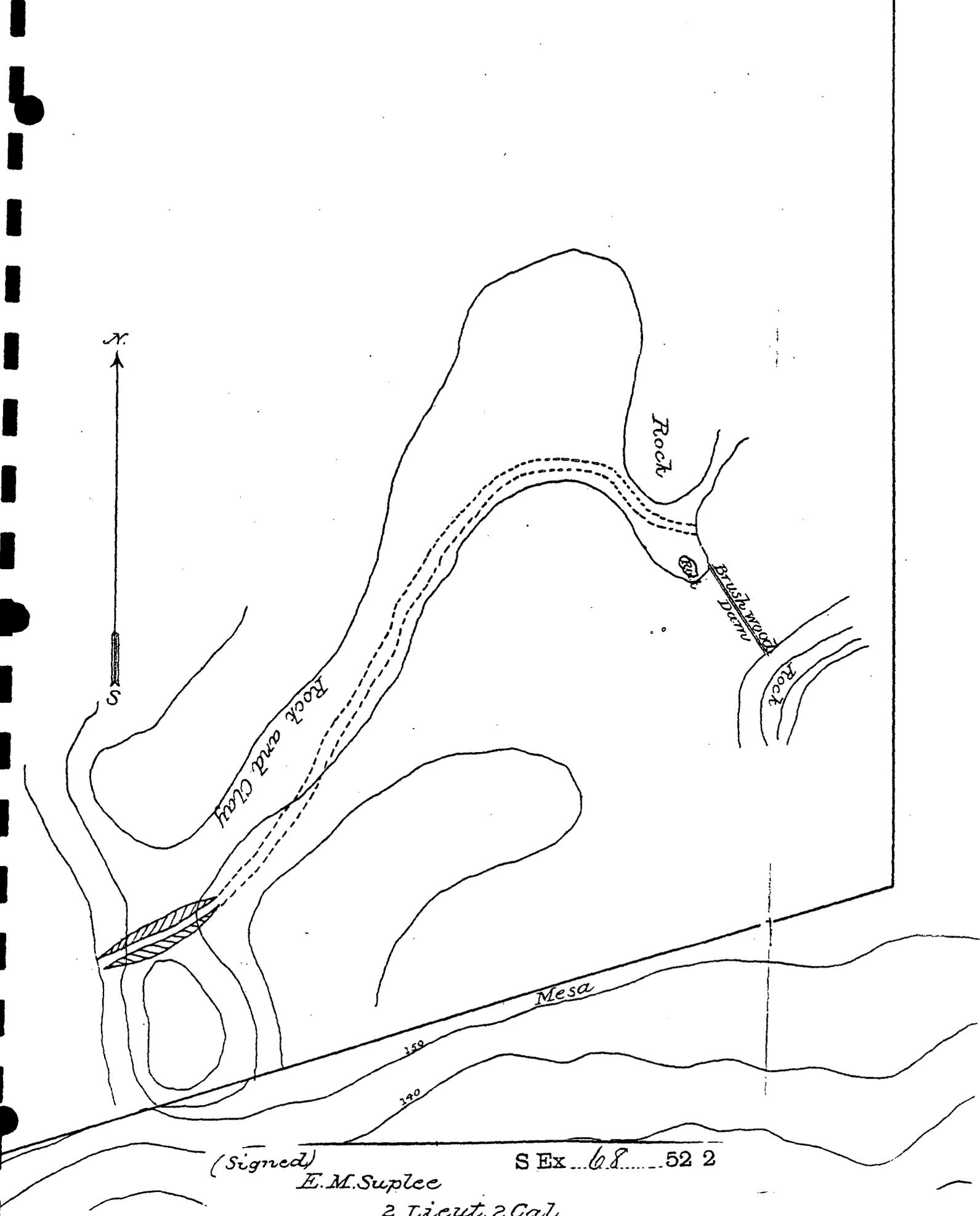
MAP I. Canaco Area and Dam Site

E. M. Suplee



(Signed) S Ex 68 52 2
E. M. Suplee
2 Lieut. 2 Cal.

MAP 2 Proposed Dam and Reservoir



(Signed)

E. M. Suplee

2 Lieut. 2 Cal.

S Ex 68 52 2

MAP 3 Proposed Diversion Dam and Ditch

