

STATE OF ARIZONA

FIRST BIENNIAL REPORT

OF THE

STATE WATER COMMISSIONER

TO THE

GOVERNOR OF ARIZONA

For the Period Beginning July 15, 1919,
Ending December 31, 1920.



W. S. NORVIEL,
State Water Commissioner
PHOENIX, ARIZONA

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PERSONNEL OF STATE WATER COMMISSION

W. S. NORVIEL.....	Commissioner
C. C. LEWIS.....	Secretary of Commission
AMY G. MARSH.....	Stenographer
FREDERIC J. CORNICK.....	Hydrographic Engineer
MILFORD R. NICHOLS.....	Assistant Engineer
HOMER E. TURNER.....	Hydrographic Engineer
BOYD E. KEITH.....	Assistant Engineer

LETTER OF TRANSMITTAL

Phoenix, Arizona,
December 31, 1920.

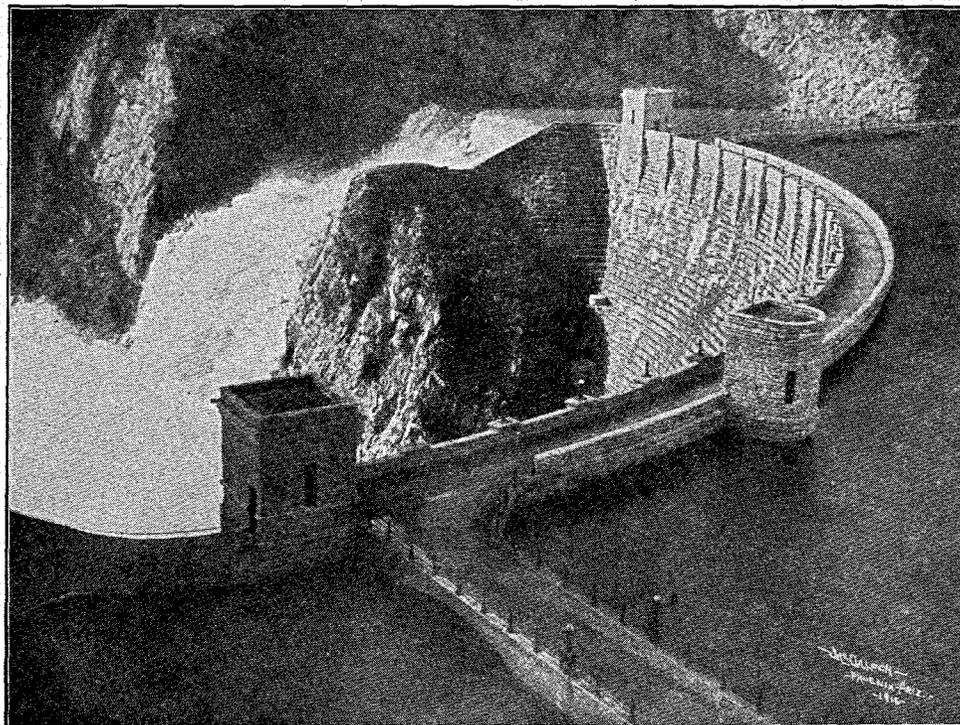
To his Excellency, Thomas E. Campbell,
Governor of Arizona.

Dear Sir:

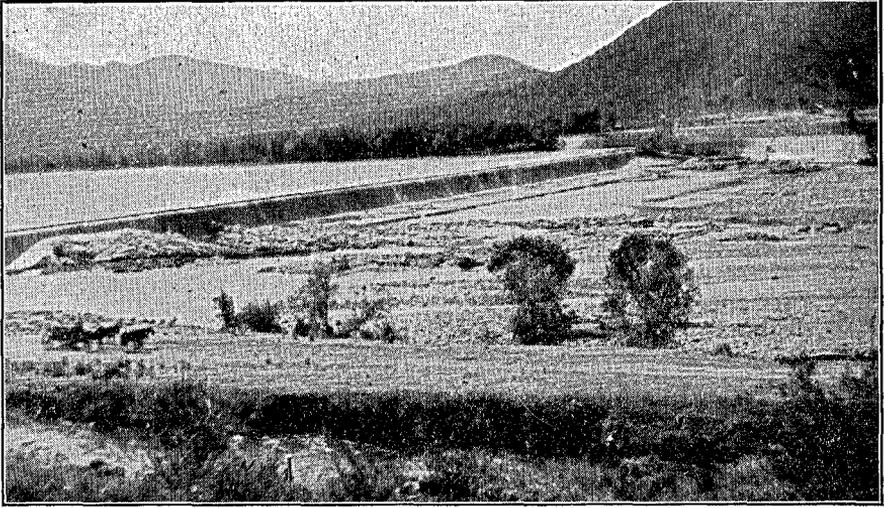
In compliance with the law, I have the honor to transmit herewith a full report of the work of the office of State Water Commissioner, including a statement of receipts and disbursements for the biennial period from the commencement of the work July 15, 1919, to January 1st, 1921.

Respectfully submitted,

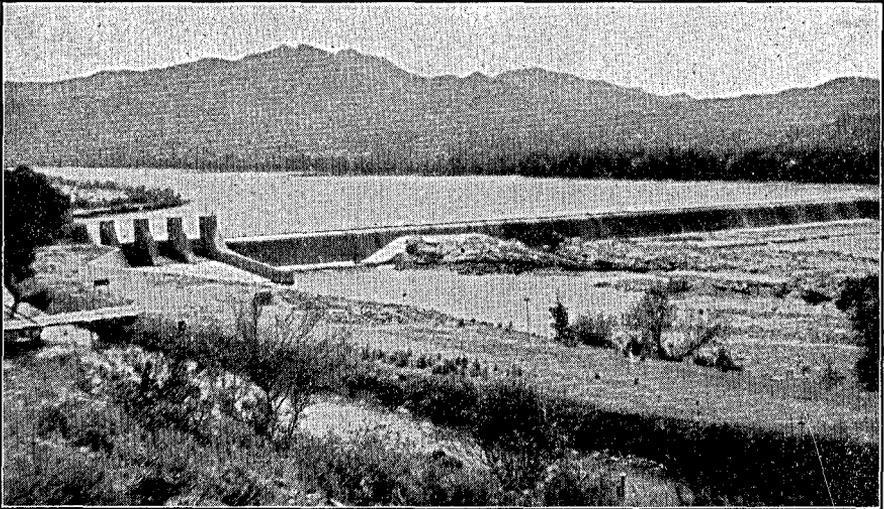
W. S. NORVIEL,
State Water Commissioner,



ROOSEVELT DAM



GRANITE REEF DAM, APRIL 15, 1920



GRANITE REEF DAM, APRIL 15, 1920

“ERRATA”

- Page 1, Line 6, paragraph 1, insert the word “within” between the words “period” and “which.”
- Page 13, Line 5, paragraph 1, insert a comma (,) after the word “feet.”
Line 10, paragraph 3, misspelled “acreage.”
Line 7, paragraph 4, misspelled “Avenente.”
- Page 17, Line App. No. 20 should read “Deer Creek Spring.”
- Page 25, Line 2, paragraph 3, misspelled “Centennial.”
Line 16, paragraph 3, misspelled “project.”
- Page 26, End of line 2 in paragraph 5, insert “to be known.”
Line 5, paragraph 5, misspelled “beneficial.”
- Page 27, Line 3, paragraph 3, “five” instead of “fine.”
- Page 31, Line 4, paragraph 3, misspelled “questionnaire.”
- Page 33, Line 20, paragraph 1, misspelled “questionnaire.”
- Page 39, Line 14, paragraph 1, misspelled “inquiries.”

FIRST BIENNIAL REPORT
OF THE
STATE WATER COMMISSIONER

The office of the State Water Commissioner was created by the adoption of Chapter 164, Laws of Arizona, 1919, by the Fourth Legislature of the State in Arizona in 1919, designated as the State Water Code Act, which became a law on the 26th day of March, 1919, but, as there was rumor that the law would be referred to the people, 90 days was allowed to elapse, the period which referendum petitions might be perfected and filed, before action was taken by the Governor on the measure.

On the 28th day of June the writer was appointed State Water Commissioner, his appointment to take effect on the 15th day of July, 1919, and the period from that date to and including the 31st day of December, 1920, is the period covered by this First Biennial Report.

The State Water Code Act is similar in its general provisions to the laws of the other so-called "arid west" or irrigation states, but follows more closely, perhaps, the law of Oregon, and Arizona was the last of the irrigation states, except perhaps Montana, to adopt a law of this kind.

The Commissioner was authorized by the Water Code, and it became his duty to formulate such necessary rules and regulations concerning the appropriation, adjudication and distribution of the waters of the state as should be deemed advisable for the orderly administration of the office. To that end, rules and regulations for the appropriation of water were made and adopted for the use of appropriators; application blanks or forms were prepared for the appropriation of water, for storage in reservoirs, and for the enlargement of existing enterprises; township plats were specially printed for filing in bound or book form to be used by appropriators upon which to draw their preliminary maps; blank receipts, notices, and various other blanks were prepared for use in the various steps of appropriations as the work should progress.

For the determination or adjudication of existing rights, blank petitions were prepared and blank notices of such determination, and blank statement of proof of claimant in the form of a deposition; notices of hearing and other blanks to be used in the course of the progress of the adjudication of rights; and finally a Certificate of Water Right was prepared to be filed with the County Recorder of the County in which the water right is located.

Blank books for the records, books of accounts, and other books for the proper conduct of the office were prepared and printed, all record books being loose leaf books.

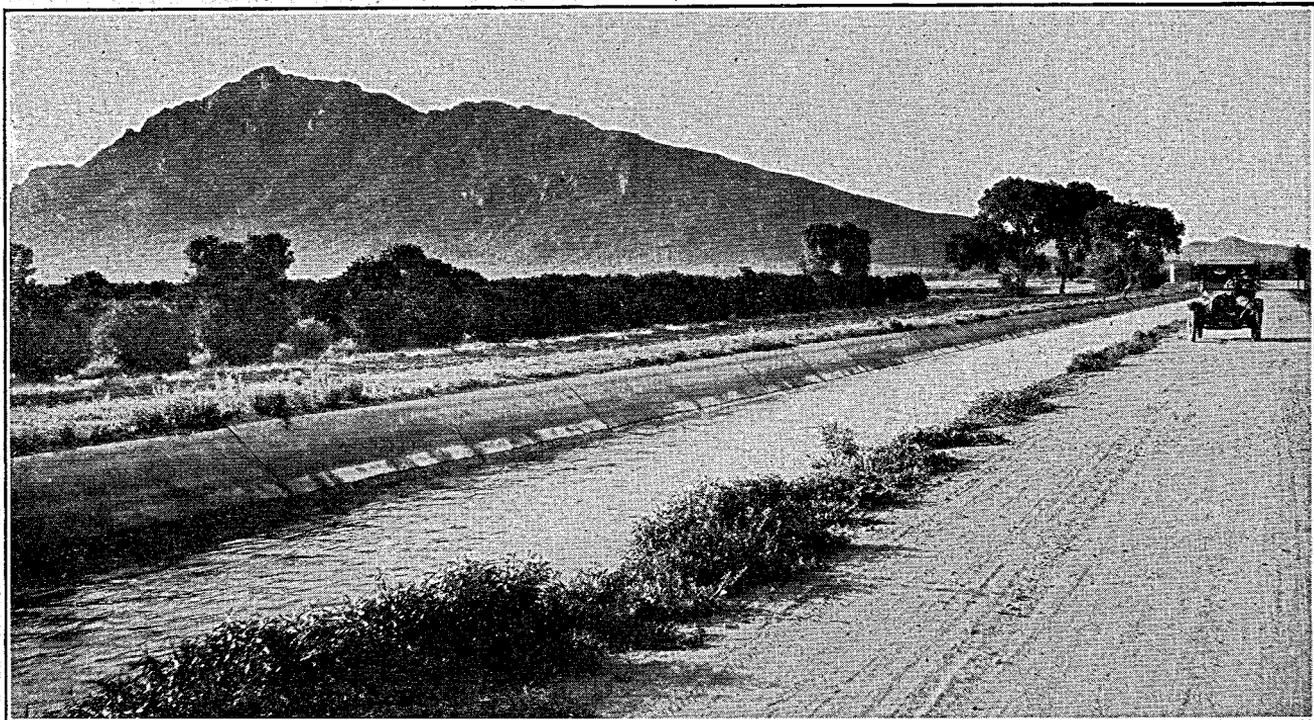
On the 1st day of October, 1919, office room was provided at the Capitol and on that date Mr. C. C. Lewis was appointed Secretary of the Commission. Prior to that time the writer kept a portion of his former law offices in the Monihon Building, where he prepared most of the forms and blanks above mentioned. Inquiries for the appropriation of water were being made, and, as soon as blanks could be gotten ready and printed, the business of receiving applications commenced.

At the time of the adoption of the Water Code Act there were a few large well regulated irrigation and power projects in operation in the State. Two of these were the results of the United States Reclamation Act and constructed under the direction of the United States Reclamation Service, to-wit: the Salt River Valley Project and the Yuma Project. These are well known projects in the West and are well organized, well conducted irrigation projects.

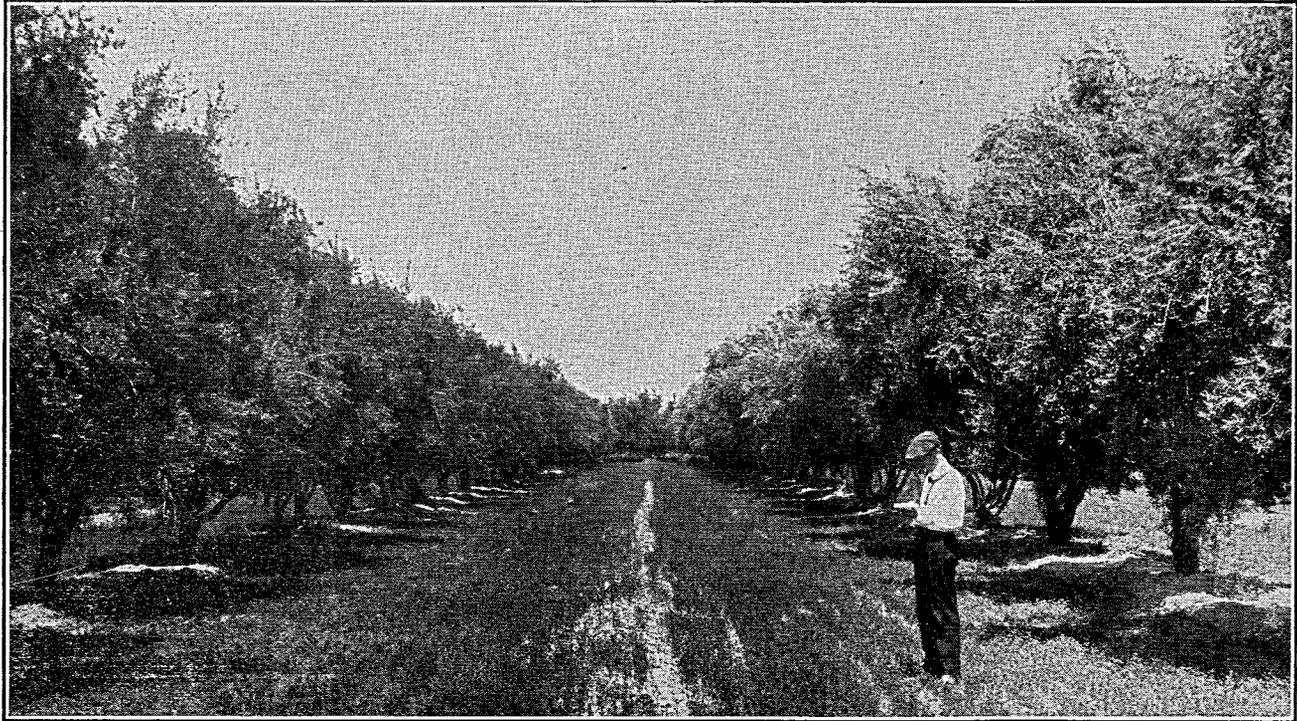
The Salt River Project is one of the largest and perhaps one of the best of the irrigation projects built or constructed by the United States Reclamation Service. It impounds in a reservoir behind the Roosevelt Dam on the Salt River a little more than 1,250,000 acre feet of water, which reservoir has been filled to overflowing several times since its completion. The diversion dam at Granite Reef diverts the water into two canals, one on the North bank and the other on the South bank of the river. Hence it serves about 215,000 acres of fine land, not including the Tempe Irrigation District, which irrigates some 23,500 acres and which is within the boundaries of the project except on its South border but is not a part of the Salt River Project, though it receives its water turned down to it through the Granite Reef dam. The land of this project lies in the Salt River Valley on both the north and south banks of the Salt River and with the City of Phoenix in the approximate center of the valley. In addition to the irrigation of this land the Salt River Valley Water Users' Association, which now controls and operates the project has five power plants which furnish light and power for domestic and other uses in the valley and nearby communities.

The farmers of this valley are engaged in a generally diversified farming, making a specialty in the last two or three years of long staple cotton. There is a considerable acreage devoted to the growing of citrus fruits along the foothills, on either side of the valley.

The Yuma Project in Yuma County is the second largest irrigation project now in operation in Arizona, and is the other project in the State constructed by the United States Reclamation Service. The water for this project is diverted from the Colorado River by the Laguna dam across the river about 10 miles above the city of Yuma, diverting the water out on the California side of the river, where a considerable acreage of land is irrigated from this diversion. The water is brought across the river from the west to the east side of the river at Yuma by a siphon



A CANAL SCENE NEAR SCOTTSDALE, IN THE ROOSEVELT PROJECT



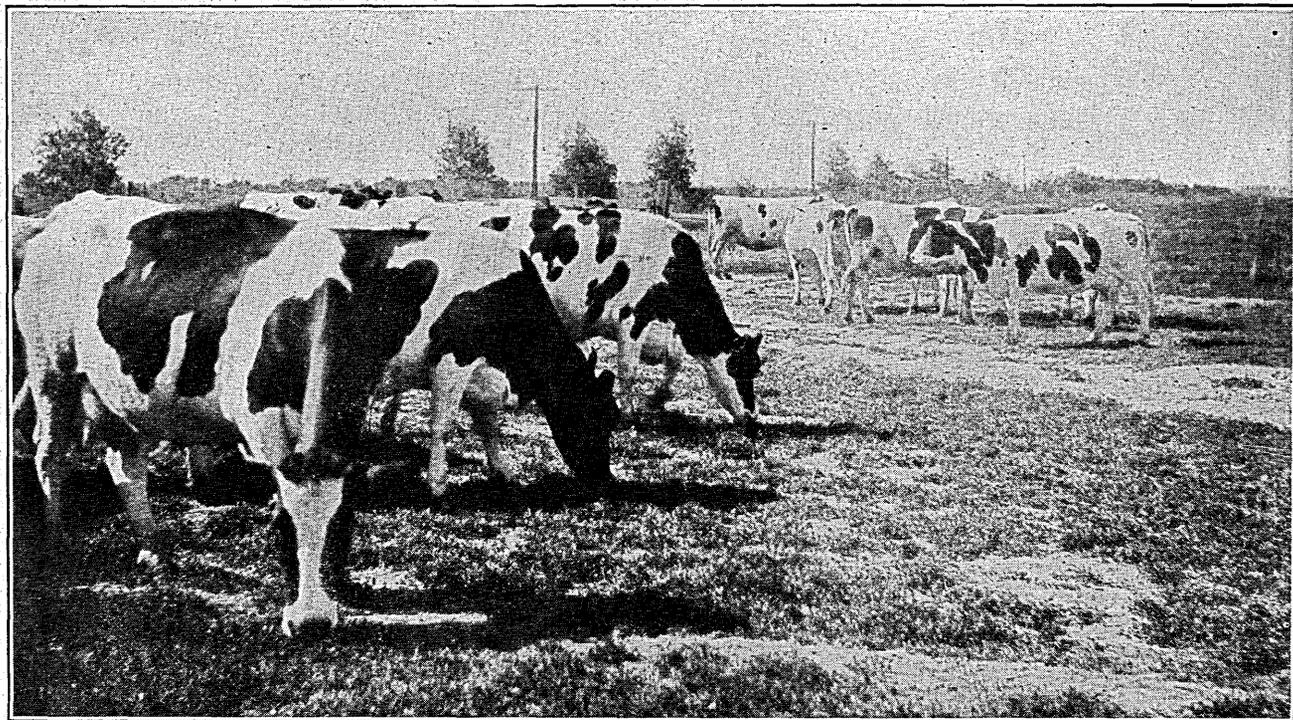
CITRUS FRUITS IN THE SALT RIVER VALLEY

and there is being irrigated now in the Yuma Valley approximately 37,500 acres of land. The farming in this valley is generally diversified, but in the last two or three years has centralized to the production of long staple cotton, for which it appears to be well adapted, both as to soil and climate. There is also quite a large acreage devoted to the growing of citrus fruits.

There was also in course of construction on the Little Colorado River about 15 miles above the town of St. Johns in Apache County the dam known as the Lyman Dam. This dam is yet uncompleted. The State is interested in the financing of this project and it is expected that the dam will be completed in the early part of the year 1921. The capacity of the reservoir formed by this dam will be a little more than 45,000 acre feet and it is intended to bring into cultivation and irrigation 15,000 acres of new lands, a part of which is mesa land lying south and east of the town of St. Johns, in addition to the irrigation of the lands which have been irrigated from the Little Colorado River in that vicinity. The Lyman Reservoir Company has succeeded to the reservoir rights of the St. Johns Irrigation Company created by what was known as the Big Salado Reservoir which the latter company had and owned until about 1905 when the dam washed out. The first Lyman Dam, which was constructed on the site of the present Lyman Dam and some seven miles above the old Salado Dam, was likewise lost by flood and the second Lyman Dam is now being built as above stated. The land under this project is at an altitude of a little more than 5,000 feet and is well adapted to the growing of grains, alfalfa, and fruit, and seems especially adapted to dairy farming.

The Snowflake and Taylor Irrigation, Grist Mill & Electric Light Company have a dam across Silver Creek about 10 miles above the town of Snowflake, forming a reservoir with a capacity of about 7,000 acre feet of water. This dam was commenced in 1904 and was three or four years in building. It furnishes water for about 2,500 acres of land in the communities of Shumway, Taylor and Snowflake. Shumway has a population of about 75 persons resident therein, and in the year 1919 produced approximately 65 tons of apples; at this place is located the company grist mill and power plant where the wheat, corn and other grains are ground for home consumption and every year a quantity of flour is shipped out. The small power plant also furnishes electric light for the three communities as well as power one half day two days in each week, Tuesday and Thursday for "washing and ironing days." The altitude of these communities is about 5,000 feet, and this locality is also well adapted to the growing of grains, alfalfa, vegetables and fruit and especially apples. It is also well adapted to dairy farming.

There were many places where irrigation has been carried on for many years without storing water but simply by diverting it from the source of supply and taking it to lands by gravity. These vary in size from an acre or two to as many as 35,000 acres in a body or valley and are owned and managed by individuals, associations, companies or corporations.



ARIZONA MONEY-MAKING DAIRY HERD

The Safford Valley is one of the largest, best watered and most highly cultivated sections of the state, and one of the most prosperous. This is one of the many Gila River valleys and is in Graham County. The water is taken from the Gila River by means of ten or twelve main canals. This valley has an altitude of a little less than 3,000 feet, a rich soil, a salubrious climate and is ideal for general, diversified farming. Portions of the valley bear the ear marks of a little too extravagant use of water at times, and portions of it now are in need of drainage, and some of it has already become useless on that account. Safford is the principal town, is approximately in the middle of the valley and the county seat of Graham County.

Duncan Valley is the uppermost valley on the Gila River in Arizona. It has an irrigated area of between six and seven thousand acres. The water for these lands is taken from the Gila River by means of several canals or ditches, most of which have their heads in the State of New Mexico. The valley is also well adapted to general, diversified farming. The town of Duncan is in approximately the middle of this valley.

In Yavapai County a reinforced concrete dam has been constructed across Granite Creek, about four miles north of the city of Prescott, forming what is known as Watkins Lake having a capacity of about 3,000 acre feet and there is cultivated and irrigated from this source of supply about 2,500 acres of slightly rolling but fine farming land near the town of Jerome Junction, about 15 miles northerly from the reservoir site. This project is known as the Alfalfa Farms Company Project. It is proposed to construct another dam in the vicinity of the former dam but on Willow Creek which would form a reservoir of much larger capacity and would serve to irrigate a larger acreage in the same locality in Lonesome Valley. At the beginning these two projects were intended to be constructed together as one project, the first unit being the one already constructed but the property having changed hands once or twice the present owners of the Alfalfa Farms Company, in all probability, will not construct this second unit but will leave that to others, and a company is now organized, as we are informed, and is collecting data preliminary to the construction work of the reservoir on Willow Creek. This project has merit and an ideal climate, the soil is rich and well suited for diversified farming, especially for fruit, grain, hay and dairying, and by proper conservation of the water will take care of 10,000 acres in the combined project or the two projects separately.

In the Florence-Casa Grande Valley on the Gila River in Pinal County there is a very large tract of fine land susceptible of irrigation from the river if water could be obtained for it. However, of late years the river has been what might be termed flashy to such an extent that only in portions of the year was there sufficient water to irrigate any considerable acreage. The Lockwood decision or decree in the Lobb vs. Avenete case decreed water rights in the original decree of 1916 and several supplementary decrees to approximately 14,000 acres of land in the Florence-Casa Grande district.

By an act of Congress approved May 18, 1916, an appropriation was made under the Indian Appropriation Act to construct two diversion dams, one at or near Sacaton, and the other to be located about 12 miles above Florence on the Gila River for the purpose of diverting the waters of the Gila for irrigation, primarily for the Pima Indian Reservation and second for the irrigation of the so-called "white lands" in the Florence-Casa Grande Valley.

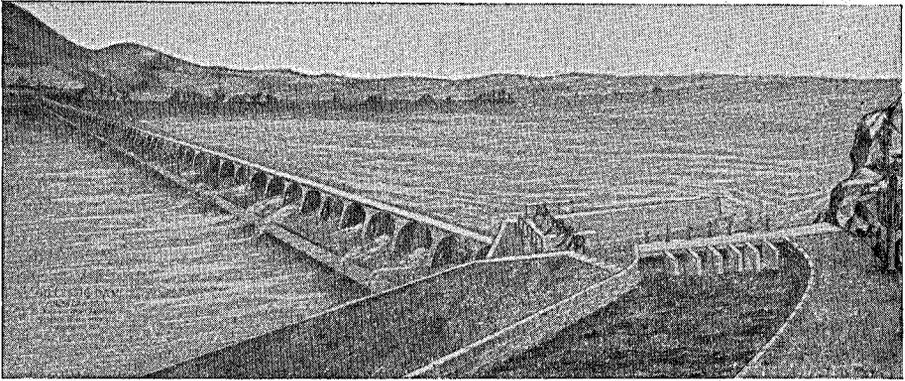
An agreement has been entered into between the residents of the Florence-Casa Grande Valley and the Indian Service for and on behalf of the Indians of the Reservation whereby it is agreed that when this project is completed and the water diverted it shall be divided, the larger portion of it to go to the Indian Reservation and the smaller portion to the "white lands" of the Florence-Casa Grande Valley according to the specifications in the agreement, 35,000 acres in the Reservation and 27,000 acres in the Florence-Casa Grande Valley. The agreement also specifies by legal description the 27,000 acres of privately owned lands which have been set apart as the land to receive water through this project when completed.



ONE OF THIS SEASON'S COTTON CROPS IN THE GILA RIVER VALLEY

For many years the people of the Florence-Casa Grande Valley have been working on the proposition of a storage reservoir at San Carlos,

a damsite which has been examined many times by government engineers and others, and by practically all of them pronounced feasible, and it is hoped by the people of Arizona and especially of Florence and Casa Grande that government aid will be extended in the near future for the construction of a large storage dam at San Carlos, and if this work is consummated it is expected that the project will include something over 100,000 acres of privately owned land besides the Indian Reservation. No filings have been made in this office for any water rights concerning either the storage or diversion rights of this project.



VIEW OF THE GILLESPIE DAM WHEN COMPLETED:

One of the largest diversion dams in the world. The completion of this dam will be the means of bringing under cultivation 100,000 acres of desert land

The Gila Water Company is constructing a dam across the Gila River near Gila Bend on the site where a dam was once constructed by Governor Wolfley some 30 years ago and which was lost about the same time by a flood. The dam now being built is of reinforced concrete and is expected to reclaim from 80,000 to 100,000 acres of the Gila River bottom lands. The cost of this project will approximate two millions of dollars and is private capital. This is known as the Gillespie Proposition. No application for a permit to appropriate water for this project has been filed in this office, it being claimed that the water right for the project was perfected prior to the adoption of the Water Code and that they have proceeded with due diligence to complete the project.

HYDROGRAPHIC AND HYDROMETRIC DATA.

The only hydrographic data obtainable by and for the use of this office at the commencement of our work was the data that had been kept by the United States Geological Survey and that of the University of Arizona under the direction of Professor G. E. P. Smith, and some records which were kept by projects in operation, and a few instances of private records kept by companies or individuals, all of them so far as we have been able to learn of them have been very kindly furnished us, but taking

the state as a whole, the entire hydrographic record is somewhat fragmentary on most of the important streams upon which the records have been kept, while little or no records at all have been kept on other streams in localities of considerable importance. This lack of complete records has been because of the lack of funds. It is our intention to co-operate with the United States Geological Survey and with Professor Smith of the University to extend the hydrographic work as rapidly as our finances will permit. The extension of this work is of vital importance to the state in the proper conservation and the ascertainment of the irrigable land in localities where water is or may be made available for irrigation.

NEW RIGHTS.

The State Water Code establishes a new order of procedure in acquiring a right to the use of water in our State. Prior to 1893 an appropriator of water in Arizona to establish a right for himself, simply took the water from its source and applied the same to some beneficial use. The fact of the beneficial use was all that was required so long as he did not infringe upon another's prior right. The Legislature in 1893 passed a law requiring appropriators of water to post a notice of intention and have a copy of the same recorded with the County Recorder in order to protect the appropriation. However, this law was not strictly adhered to and an application of water to beneficial use was deemed sufficient by the courts to establish a water right, and in the main this latter course has been pursued by appropriators. Some have undertaken to follow the law and posted a notice but did not have a copy of same recorded. Others complied with the letter of the law, but when the matter was brought to the attention of the courts and it was shown that an appropriator had made a beneficial use of water for a number of years with intention to establish a permanent right, the courts have uniformly declared that he had established a right superior to other later appropriators.

From this course of procedure, it will be observed that the records of water rights in Arizona can be no more than fragmentary as many of them do not appear upon any of the records of the state or counties and the records that have been kept are not such as to be a very great help to the public in general as indicating what waters are yet unappropriated. Lack of general authorized supervision and the natural inclination of people to get all they can when it is free has caused a great deal of waste of water and a considerable confusion among appropriators.

The orderly manner provided by the Water Code for the acquiring of new rights is greatly appreciated by appropriators as a long step forward in the development of one of the greatest resources of the State by the more economical use of water and also by avoiding in a great measure many of the difficulties formerly existing by establishing a complete record of all the rights perfected under the Water Code.

A careful perusal of the following table will give some idea of the activity in the State of Arizona in the desire to appropriate the waters of the State to a beneficial use.

APPLICATIONS TO APPROPRIATE WATER — JULY 15, 1919, TO DECEMBER 31, 1920.

App. No.	Name of Applicant	Source of Appropriation	Amount Water	Diversion Point Sec. Tp. R.	Use	Estimated Cost	No. Acres	No. H. P.	No. Permit	No. Ctf.	Action Taken
1.	O. E. Walker...	Granite Spring...	1 sec. ft.	20 20N. 16W.	Stockwater...	\$ 50.00			1	1	Cancelled
2.	Loring C. Lennox.	Salt River.....	12 sec. ft.	34 1N. 1E.	Irrigation.....	2,000.00	960				
3.	Ariz. Stock Co...	Unknown Spring..	4 sec. ft.	(25 6S. 2E.) (Unsurveyed)	Stockwater.....						
4.	Ariz. Stock Co...	Well (Pump)		(25 6S. 2E.) (Unsurveyed)	Irrigation.....	250.00	320		2		
				(29 6S. 20E.) (Unsurveyed)	Stockwater.....	500.00			3		
5.	Aravaipa Leasing Co.	Laurel Creek.....	1 sec. ft.	(29 6S. 20E.) (Unsurveyed)	Domestic.....	1,000.00			4		
6.	Fred A. Lydy....	Truxton Wash....	400 sec. ft.	19 23N. 13W.	Storage.....						
7.	C. C. Green, et al.	Centennial Wash..	200 sec. ft.	5 4N. 12W.	Irrigation.....	75,000.00	466		31		
					Stockwater.....	50,000.00			6		
8.	R. O. Gruwell et al.	Gila River.....	5 sec. ft.	30 1N. 1W.	Irrigation.....	4,000.00	400		7		
9.	George Hill.....	Lost Spring.....	1-20 sec. ft.	29 4S. 28E.	Stockwater.....	100.00			8		
10.	J. F. Healy and C. H. Brown....	Arrastra Creek...	5 sec. ft.	27 11N. 4W.	Domestic.....						Cancelled
11.	Thatcher Water Co.	Fry and Rapier Canyons	250 sec. ft.	34 7S. 25E.	Mining.....	40,000.00			10		
12.	Edw. B. Franklin.	Wolf Hole Lake..	1 sec. ft.	24 39N. 12W.	Domestic.....	2,000.00	46		11		Cancelled
13.	Geo. H. Bowler..	Willow Spring....	1 sec. ft.	24 39N. 16W.	Irrigation.....	2,000.00	160		12		
14.	Roy W. Winton..	Salt River.....	6-10 sec. ft.	23 1N. 3E.	Irrigation.....	800.00	45		13		
15.	D. F. Chisholm..	Castle Creek.....	1-2 sec. ft.	23 8N. 2W.	Irrigation.....		3		14		
					Domestic.....	500.00					
					Mining.....						
16.	A. H. Bell.....	Centennial Wash..	2 sec. ft.	5 4N. 12W.	Irrigation.....	10,000.00	160		15		
17.	Herbert D. Cavness	Portage Spring...	all water	7 8N. 1W.	Stockwater.....	300.00			16		
18.	Wm. F. Cavness.	Rock Fall Spring..	all water	30 9N. 1W.	Stockwater.....	300.00			17		
19.	Wm. F. Cavness.	Cottonwood Spring.	all water	30 9N. 1W.	Stockwater.....	300.00			18		
20.	Wm. F. Cavness.	Deed Creek Spring.	all water	30 9N. 1W.	Stockwater.....	300.00			19		
21.	Wm. F. Cavness.	Little Rock Spg...	all water	30 9N. 1W.	Stockwater.....	300.00			20		
22.	Wm. F. Cavness.	Banty Spring.....	all water	30 9N. 1W.	Stockwater.....	300.00			21		
23.	J. W. Jackson et al.	Salt River.....	14 sec. ft.	24 1N. 2E.	Irrigation.....	25,000.00	1813		22		
24.	John F. Tenfert..	Table Top Wash..	8 sec. ft.	6 7S. 4E.	Irrigation.....	1,000.00	640		23		Cancelled Rejected
25.	A. Krell.....	Centennial Wash..		32 5N. 12W.	Irrigation.....		160				
26.	Thatcher Water Co.	Fry and Rapier Canyons.....	3 sec. ft.	35 7S. 25E.	Domestic.....	See App. 11			24		

STATE WATER COMMISSION

APPLICATIONS TO APPROPRIATE WATER—JULY 15, 1919, TO DECEMBER 31, 1920.—(Continued)

App. No.	Name of Applicant	Source of Appropriation	Amount Water	Diversion Point		Use	Estimated Cost	No. Acres	No. H. P.	No. Permit	No. Ctf.	Action Taken
				Sec.	Tp. R.							
27.	Thomas Taylor...	Del Monte Canyon.	2 sec. ft.	6	15N. 3E.	Domestic..... Smelting.....	1,297.00				25	
28.	Standiford Bros..	Gila River.....	44 sec. ft.	8	1S. 2W.	Irrigation.....	85,000.00	2677			26	
29.	A. K. Clark.....	Oak Spring.....	1-10 sec. ft.	35	42N. 6W.	Stockwater.....	300.00				63	
30.	Earl C. McBride..	Mesquite Spring..	1 sec. ft.	13	5S. 28E.	Stockwater.....	50.00				28	
31.	A. Y. Clark.....	Cottonwood Spring.	1-8 sec. ft.	34	42N. 6W.	Irrigation.....	2,500.00	10			100	
32.	Geo. A. Bonelli..	Quail Spring.....	1-2 sec. ft.	2	24N. 19W.	Stockwater.....	700.00					
33.	Geo. A. Bonelli..	Detrital Wash....	1-2 sec. ft.	11	25N. 20W.	Irr. & Stock....	2,000.00	40				
34.	Geo. A. Bonelli..	Marble Wash.....	1-2 sec. ft.	36	25N. 19W.	Irr. & Stock....	4,000.00	20				
35.	Geo. A. Bonelli..	Lower Drip. Spgs.	1-2 sec. ft.	35	20N. 20W.	Stockwater.....	250.00					
36.	Geo. A. Bonelli..	Drip. & Sacaton"	1-2 sec. ft.	20	20N. 20W.	Irr. & Stock....	5,000.00	40				
37.	Geo. A. Bonelli..	Mud Springs.....	1-2 sec. ft.	34	26N. 19W.	Stockwater.....	500.00					
38.	Geo. A. Bonelli..	Mountain Springs.	1-2 sec. ft.	20	26N. 19W.	Stockwater.....	500.00					
39.	Geo. A. Bonelli..	Mesa Wash.....	1-2 sec. ft.	3	26N. 18W.	Irr. & Stock....	5,000.00	40				
40.	Geo. A. Bonelli..	Antelope Spring..	1-2 sec. ft.	34	26N. 18W.	Stockwater.....	700.00					
41.	Geo. A. Bonelli..	White Rock and Marble Springs..	1-2 sec. ft.	33 35	to 25N. 19W.	Stockwater.....	3,000.00					
42.	Geo. A. Bonelli..	Pine Springs.....	1-2 sec. ft.	4	25N. 18W.	Stockwater.....	3,000.00					
43.	Geo. A. Bonelli..	Ariz. Isabell Spgs.	1-2 sec. ft.	27	25N. 18W.	Stockwater.....	1,000.00					
44.	Geo. A. Bonelli..	Indian Springs...	1-2 sec. ft.	15	25N. 18W. 9-	Stockwater.....	3,000.00					
45.	Geo. A. Bonelli..	Putman Springs...	1-2 sec. ft.	17	24N. 18W.	Stockwater.....	2,000.00					
46.	Geo. A. Bonelli..	Detrital Wash....	1-2 sec. ft.	11	24N. 20W.	Irrigation.....	10,000.00	40				
47.	Geo. A. Bonelli..	Unknown Wash....	1-2 sec. ft.	1	24N. 20W.	Irrigation.....	200.00	40				
48.	Geo. A. Bonelli..	Unknown Wash....	1-2 sec. ft.	1	24N. 20W.	Irrigation.....	250.00	20				
49.	Harrisburg W. U. Assn.	Centennial Wash..	138 sec. ft.	32	5N. 12W.	Irrigation.....	100,000.00	7307			27	
50.	Anna E. Kelso...	Santa Cruz- Arizola Wash....	4 sec. ft.	24	7S. 6E.	Irrigation.....	1,000.00	320			48	
51.	Robt. Phillips et al.	Sherman Spring...	1 inch	24	5S. 28E.	Stockwater.....	50.00				49	
52.	Chas. L. Sannier & Frank E. Gillis.	Nugget, Willow & Cottonwood Spgs.	1-2 sec. ft.	6	10N. 3W.	Irrigation.....	250.00	20			5	
53.	Casimero Bravo et al.	Pantano Wash....	2½ sec. ft.	23	16S. 16E.	Irrigation.....	750.00	190			32	
54.	Ariz. Power Co..	Little Sycamore...	1-8 sec. ft.	5	11N. 4E.	Irr.—Domestic..	500.00	2			52	2
55.	P. G. Kirkendall.	Agua Fria River...	1 sec. ft.	12	9N. 2E.	Irrigation.....	150.00	40			53	
56.	Paradise-Verde Irr. District....	Verde River.....				Irr. & Power....		965.4	37800			
57.	S. H. Head et al.	Agua Fria River..		32	6N. 1E.	Irr.—Stock.....	25,000.00	200				

APPLICATIONS TO APPROPRIATE WATER—JULY 15, 1919, TO DECEMBER 31, 1920.—(Continued)

App. No.	Name of Applicant	Source of Appropriation	Amount Water	Diversion Point		Use	Estimated Cost	No. Acres	No. H. P.	No. Permit	No. Ctf.	Action Taken	
				Sec.	Tp. R.								
58.	Wm. Pike.....	Cox Spring.....	1 sec. ft.	13	10N. 5W.	Stockwater.....	100.00				29	3	
59.	Robt. L. & Wm. Davis.....	Gila River.....	1½ sec. ft.	34	1N. 1W.	Irrigation.....	1,700.00	121			55		
60.	G. L. Herring....	Gila River.....	1 sec. ft.	24	5S. 15E.	Irrigation.....	500.00	25			30		
61.	A. H. Stout.....	Quillitoza Wash....	2 sec. ft.	14	6S. 5W.	Irrigation.....	1,200.00	124			56		
62.	Carl A. Hardy....	Montrose Canyon...	2 sec. ft.	4	12S. 14E.	Irrigation.....	3,000.00	100			102		
63.	Guy Monthan.....	Pantano Wash.....	1 sec. ft.	14	16S. 16E.	Irrigation.....	1,000.00				85		
64.	A. H. Miller.....	Tucker Flat Draw...	4 sec. ft.	18	19N. 15E.	Irr.—Stock.....	5,000.00	200			59		
65.	Stene Con. Copper Co.	Williams River....		7	10N. 13W.	Irr., etc.....							Cancelled
66.	J. L. Warner et al.	Cunningham Wash	328 sec. ft.	20	7N. 15W.	Irr.—Milling.....	300,000.00	16215					
67.	Geo. A. Bonelli..	Mud Spgs. Wash..	1-2 sec. ft.	7	25N. 19W.	Irr. & Stock.....	2,000.00	20					
68.	Amos A. Betts et al.	Williams River....	1280 sec. ft.	7	10N. 13W.	Irr. & Domestic..		125834					Cancelled
69.	Geo. E. Vines....	Salt River.....	3 sec. ft.	29	1N. 2E.	Irrigation.....	1,000.00	240			9		
70.	Fred Powers....	Santa Cruz Wash..	10 sec. ft.	31	7S. 8E.	Irrigation.....	315.00	347			65		
71.	F. W. Rosenbaum.	Santa Cruz Wash..	7½ sec. ft.	14	7S. 7E.	Irrigation.....	50.00	80			66		
72.	Loyd H. Richards.	Gila River.....	12 sec. ft.	15	5S. 5W.	Irrigation.....	15,000.00	478			88		
73.	Gifford Allaire..	Four Mile Creek...	1 sec. ft.	27	7S. 19E.	Irr. & Stock.....	650.00	5			57	4	
74.	E. Brown, Trustee	McMullen Valley...	200 sec. ft.	27	7N. 10W.	Irrigation.....	500,000.00	22440					
75.	Arthur C. Young.	Buckhorn Spring..	1 inch	5	14N. 6W.	Stockwater.....	125.00				58		
76.	James M. Hendricks et ux....	Barnes', Young's, Allen Creeks....	4 sec. ft.	16	6N. 2W.	Irr. & Stock.....	300.00	320					
77.	John K. Owens et al.	W. Terminus U.S. R.S. Lateral 16...	3 sec. ft.	7	2S. 5E.	Irrigation.....	600.00	140			61		
78.	San Francisco Mt. Scenic Boulevard Co.	Arnold Spring.....	1-2 sec. ft.	15	22N. 7E.	Domestic.....	250.00				62		Cancelled
79.	Francis L. Patton Reclam. Co..	Bouse Wash.....	300 sec. ft.		7N. 17W.	Domestic.....		87680					
80.	Talbert Hicklin..	Quitovaquita Spg..	10 sec. ft.	17	17S. 7W.	Irr., Mfg., etc....	5,000.00	50			64		
81.	C. J. Tryon.....	Santa Cruz Wash..	10 sec. ft.	5	8S. 8E.	Irrigation.....	300.00	319			67		
82.	W. H. Dagg.....	Little Colorado R.	2000 sec. ft.	11	17N. 17E.	Storage.....	218,260.00				68		
83.	Joseph Banegas..	Big Sandy River...	60 sec. ft.	13	15N. 13W.	Irrigation.....	600.00	50					
84.	H. E. Carnes et al.	Gila River.....	54 sec. ft.	15	8S. 26E.	Irrigation.....	3,000.00	290					
85.	Auxiliary Eastern Canal Landowners' Assn.	Salt & Verde Rivers.....	522 sec. ft.	13	2N. 6E.	Irrigation.....	717,230.00	41771					

APPLICATIONS TO APPROPRIATE WATER—JULY 15, 1919, TO DECEMBER 31, 1920.—(Continued)

App. No.	Name of Applicant	Source of Appropriation	Amount Water	Diversion Point Sec. Tp. R.	Use	Estimated Cost	No. Acres	No. H. P.	No. Permit	No. Ctf.	Action Taken
86.	Auxiliary Eastern Canal Landowners' Assn.	Salt River.....	1500 sec. ft.		Irr. & Power.....		17669				
87.	Jose Mendosa....	Consolidated Canal	5 sec. ft.	33 2S. 5E.	Irrigation	170.00	152		70		
88.	J. Chambers.....	Buckeye Canyon...	5 sec. ft.	13 13S. 27E.	Irrigation	500.00	200		69		
89.	Alex. Hudson....	Lulle Spring.....	1-4 sec. ft.	31 5S. 20E.	Stockwater.....	250.00			71		
90.	Alex. Hudson....	Black Canyon Spg.	1-10 sec. ft.	21 5S. 19E.	Stockwater.....	100.00			72		
91.	Alex. Hudson....	Turkey Creek.....	1-10 sec. ft.	5 7S. 19E.	Stockwater.....	250.00			73		
92.	Alex. Hudson....	Warm Spring.....	1-2 sec. ft.	24 5S. 19E.	Stockwater.....	350.00			74		
93.	Alex. Hudson....	Williamson Spg....	1-10 sec. ft.	19 5S. 20E.	Stockwater.....	250.00			75		
94.	Alex. Hudson....	Anderson Spring..	1-4 sec. ft.	16 5S. 19E.	Stockwater.....	200.00			76		
95.	Alex. Hudson....	Black Butte Spg..	1-10 sec. ft.	6 7S. 19E.	Stockwater.....	250.00			77		
96.	Alex. Hudson....	Buggar Spring....	1-80 sec. ft.	8 6S. 18E.	Stockwater.....	250.00			78		
97.	Alex. Hudson....	Boulder Spring...	1-40 sec. ft.	16 5S. 19E.	Stockwater.....	75.00			79		
98.	Alex. Hudson....	Cottonwood Spg..	1-80 sec. ft.	21 5S. 19E.	Stockwater.....	50.00			80		
99.	Alex. Hudson....	Box Seep Spring..	1-80 sec. ft.	21 5S. 19E.	Stockwater.....	15.00			81		
100.	Alex. Hudson....	Oak Spring.....	1-70 sec. ft.	21 5S. 19E.	Stockwater.....	25.00			82		
101.	Alex. Hudson....	Juniper Spring...	1-100 sec. ft.	16 5S. 19E.	Stockwater.....	40.00			83		
102.	Alex. Hudson....	Cottonwood Seep..	1-100 sec. ft.	6 7S. 19E.	Stockwater.....	50.00			84		
103.	Leo VeVages et al.	Consolidated Canal	3 sec. ft.	34 2S. 5E.	Irrigation	750.00	200		86		
104.	J. E. Rempel....	Heaton Canal....	2 sec. ft.	22 13S. 27E.	Irrigation	2,000.00	80		87		
105.	C. S. Steward....	Mt. View Spring..	1-2 sec. ft.	16 6N. 10W.	Stockwater.....	1,000.00			85		
106.	B. F. Youngker..	Flood waters.....	3 sec. ft.	12 1N. 2W.	Irrigation	500.00	200		92		
107.	C. N. Puterbaugh.	Baker Spring.....	1-80 sec. ft.	17 6S. 17E.	Stockwater.....	50.00			89		
108.	L. V. McCourt...	Aravaipa Creek...		24 6S. 18E.	Power.....			500			
109.	C. N. Puterbaugh.	Gibson Spg. No. 2.	1-80 sec. ft.	17 6S. 17E.	Stockwater.....	75.00			90		
110.	C. N. Puterbaugh.	Gibson Spg. No. 3.	1-40 sec. ft.	17 6S. 17E.	Stockwater.....	75.00			91		
111.	J. W. Etter et al.	Jack Smith Cany'n	3 sec. ft.	36 24N. 7E.	Irrigation	1,000.00	160				
112.	J. L. Jolley.....	Rock Canyon.....	10 sec. ft.	7 41N. 9W.	Irrigation	2,000.00	640				
113.	E. Payne Palmer.	Hassayampa River.	1 sec. ft.	22 6N. 4W.	Mining.....	3,500.00			101		
					Domestic.....						
114.	Ben P. Snure....	Starvation Canyon.	1 sec. ft.	30 21S. 32E.	Domestic.....	500.00					
					Stockwater.....						
115.	U. V. Copper Co.	Walnut Springs...	5 sec. ft.	28 16N. 2E.	Mining.....	26,455.00					
					Domestic.....						
116.	U. V. Copper Co.	Baltimore Springs.	1-8 sec. ft.	2 15N. 2E.	Mining.....	500.00					
					Domestic.....						
117.	U. V. Copper Co.	Allen, Cliff, Blow-out, Haskell Spgs.	5 sec. ft.	30 32 16N. 2E.	Mining.....	Completed and in use for several years					
					Domestic.....						

APPLICATIONS TO APPROPRIATE WATER—JULY 15, 1919, TO DECEMBER 31, 1920.—(Continued)

App. No.	Name of Applicant	Source of Appropriation	Amount Water	Diversion Point		Use	Estimated Cost	No. Acres	No. H. P.	No. Permit	No. Ctf.	Action Taken
				Sec.	Tp. R.							
118.	Hull Copper Co..	Hull Springs.....	1 sec. ft.	21	16N. 2E.	Mining.....	Completed and in use for several years					
119.	C. H. Brown et al.	Arrastra Creek....	8 sec. ft.	34	11N. 4W.	Domestic.....		20,000.00				
120.	B. M. Merrill....	Antelope Creek....	15 sec. ft.	25	10N. 5W.	Domestic.....	100,000.00					
121.	W. S. Finicum et al.	Silver Creek, Trough Springs...	1 sec. ft.		17S. 31E.	Hyd. Mining.....	5,000.00					
122.	Richard Day.....	Eshom's Cienaga...	1000 sec. ft.	14	16N. 16W.	Irrigation.....	60,000.00	29000				
123.	Three Links Cattle Co.	Polly Springs.....	1-40 sec. ft.		9N. 2W.	Irrigation.....						
124.	Three Links Cattle Co.	Tussock Springs...	1-10 sec. ft.	24	9N. 2W.	Stockwater.....						Completed & in use for yrs. 94
125.	Three Links Cattle Co.	Iron Springs.....	1-10 sec. ft.		8N. 3W.	Stockwater.....						Completed & in use for yrs. 95
126.	Chas. W. Burkett.	Well (Public Land)	3-100 sec. ft.	22	5S. 2E.	Stockwater.....	1,120.00					Completed & in use for yrs. 96
127.	Amandus Peters.	Honedra Wash....	45 sec. ft.	26	5S. 7E.	Irrigation.....	250.00	150			93	
128.	A. R. Jenkins....	Vekal Wash.....	10 sec. ft.	27	8S. 1E.	Storage—Irr.....	500.00					
129.	Barkley & Steward	Coffee Flat Spg...	5 inches	35	1N. 10E.	Stockwater.....	125.00					
130.	Barkley & Steward	Lebarga Spring....	20 inches	5	1S. 10E.	Stockwater.....	200.00					
131.	Barkley & Steward	Big Spring.....	15 inches	11	1S. 10E.	Stockwater.....	360.00					
132.	W. T. Jones.....	Secret Spring....	10 inches	27	20N. 20W.	Domestic—Min'g.	2,000.00					
133.	Geo. Swingle....	San Pedro River..	1 sec. ft.	6	6S. 16E.	Irrigation.....	500.00	7			103	
134.	W. T. McClenden et al.	Queen Creek.....	3 sec. ft.	36	1S. 10E.	Irrigation.....	7,000.00	160				
135.	S. R. V. W. U. Assn.	Salt River.....	1000 sec. ft.			Irr.—Power.....	500,000.00			2270		
136.	S. R. V. W. U. Assn.	Salt River.....	350 sec. ft.			Power.....	700,000.00			4000		

STATE WATER COMMISSION

RESERVOIRS

App. No.	Name of Applicant	Source of Appropriation	Amount—Water	Diversion Point		Use	Estimated Cost	No. Permit	No. Ctf.	Action Taken
				Sec.	Tp. R.					
1	Paradise-Verde Irr. Dist.	New River	51500 a. ft.	35	5N. 1E.	Irrigation	\$ 800,000.00	1		
2	Arizona Stock Co.	Unknown Spring	2 a. ft.	19	5S. 2E.	rr. Stockwater	250.00	2		
3	Arizona Stock Co.	Unknown Wash.	2 a. ft.	10	6S. 2E.	'tockwater	75.00	3		
4	Arizona Stock Co.	Unknown Wash.	2 a. ft.	36	6S. 2E.	Stockwater	250.00	4		
5	Paradise-Verde Irr. Dist.	Skunk Creek	25000 a. ft.	36	6N. 2E.	Irrigation	200,000.00	5		
6	Paradise-Verde Irr. Dist.	Verde River	440000 a. ft.	11	12N. 5E.	Irr. Power	3,000,000.00	6		
7	Paradise-Verde Irr. Dist.	Verde River	205000 a. ft.	22	8N. 6E.	Irr. Power	2,000,000.00	7		
8	Thatcher Water Co.	Fry and Rapiar Canyon	24 a. ft.	34	7S. 25E.	Domestic	2,000.00	8		
9	Thatcher Water Co.	Fry and Rapiar Canyon	172 a. ft.	35	7S. 25E.	Domestic	3,000.00	9		
10	Greenview Irr. Ass'n.	Quojota Creek	13200 a. ft.	10	9S. 6E.	Irrigation	200,000.00	10		Cancelled
11	Chas. W. Burkett.	Burkett Wash.	9 a. ft.	30	5S. 2E.	Stockwater	900.00	11		
12	Geo. A. Bonelli.	Turkett Wash.	all	2	26N. 20W.	Irr. Stockwater	2,000.00			
13	Geo. A. Bonelli.	Mud Spgs. Wash.	all	7	25N. 19W.	Irr. Stockwater	2,000.00			
14	Anna E. Kelso.	Santa Cruz—Arizona Wash.	90 a. ft.	11	7S. 6E.	Irrigation	2,000.00	14		
15	S. A. Shappell et al.	Rincon Creek	25000 a. ft.	18	15S. 17E.	Irrigation	250,000.00	15		Cancelled
16	S. A. Shappell et al.	Rincon Creek	3000 a. ft.	24	15S. 16E.	Irrigation	125,000.00	16		Cancelled
17	W. H. Dagg.	Little Colorado R. & Silver Creek	300000 a. ft.	32	16N. 22E.	Irr., Power, Domestic	500,000.00	21		
18	W. H. Beardsley.	Agua Fria River	145679 a. ft.	16	6N. 1E.	Irrigation	1,828,561.00	18		
19	Paradise-Verde Irr. Dist.	Cave Creek	2400 a. ft.	29	6N. 4E.	Irrigation				Returned
20	A. H. Miller.	Tucker Flat Draw	480 a. ft.	18	19N. 15E.	Irr. Stockwater	5,000.00	19		
21	Fred A. Lydy.	Truxton Wash.	1850 a. ft.	11	23N. 14W.	Irrigation	100,000.00	12		
22	Stene Consolidated Copper Co.	Williams River	100000 a. ft.	7	10N. 13W.	Power, Mining, Irr. & Domestic	1,081,242.00			
23	Brigham H. Cluff.	Shingle, Ash & White Streak Crk.	1500 a. ft.	14	7S. 24E.	Irrigation	10,000.00	20		
24	Joseph L. Warner et al.	Cunningham Wash.	960 a. ft.	36	7N. 15W.	Irr., Power, Mine	135,000.00			Returned
25	N. W. Haggard.	Williams River	200000 a. ft.	9	10N. 13W.	Irrigation	500,000.00			Returned
26	W. W. Gierhart.	Bullrush Wash.	32000 a. ft.	3	38N. 5W.	Irrigation	12,000.00			Returned
27	James M. Hendricks et ux.	Barnes, Young & Allen Creeks	640 a. ft.	16	6N. 2W.	Irr. Stockwater, Domestic	2,000.00			
28	W. H. Dagg.	Chevelon Creek	90000 a. ft.	17	18N. 18E.	Irrigation	627,431.00	22		
29	H. E. Carnes et al.	Seneca Wash.	150 a. ft.	10	8S. 26E.	Irrigation	3,000.00			Returned
30	Aux. Eastern Canal Ass'n.	Salt River	400000 a. ft.			Irr. Power				Returned
31	J. Chambers.	Buckeye Canyon	58½ a. ft.	7	13S. 28E.	Irrigation	500.00	23		

RESERVOIRS — (Continued)

App. No.	Name of Applicant	Source of Appropriation	Amount— Water	Diversion Point		Use	Estimated Cost	No. Permit	No. Ctf.	Action Taken
				Sec.	R.					
32	Ariz. Cotton Growers' Ass'n.	Quojota Creek....	15000 a. ft.	30	9S. 7E.	Irrigation.....	250,000.00			Returned
33	L. V. McCourt.....	Aravaipa Creek....	all	24	6S. 18E.	Power.....	350,000.00			
34	Paradise-Verde Irr. Dist.....	Verde River.....	200000 a. ft.	33	6N. 7E.	Irr. Power.....	2,100,000.00			
35	Paradise-Verde Irr. Dist.....	Cave Creek.....	20000 a. ft.	4	4N. 3E.	Irrigation.....	600,000.00			
36	Howard Sheep Co.....	Howard Wash.....	6 a. ft.	10	8N. 6W.	Stockwater.....	1,000.00	24		
37	Samuel Y. Satathite.....	Mud Spgs. Creek....	1½ a. ft.	17	7N. 18E.	Stockwater.....	200.00	25		
38	Ben F. Snure.....	Starvation Canyon.	6 a. ft.	30	21S. 32E.	Stock—Domestic..	500.00			
39	U. V. Copper Co.....	Walnut Springs....	2 a. ft.	28	16N. 2E.	Mining—Domestic..	26,455.00			
40	R. M. Merrill.....	Antelope Creek....	50½ a. ft.	25	10N. 5W.	Hydraulic Mining..	30,000.00			
41	R. M. Merrill.....	Antelope Creek....	41½ a. ft.	25	10N. 5W.	"	30,000.00			
42	A. R. Jenkins.....	Vekol Wash.....	500 a. ft.	26	8S. 1E.	Irrigation.....	2,000.00			
43	Lotus Valley W. U. Ass'n....	Williams River....	1600000 a. ft.	7	10N. 13W.	Domestic. Irr. Power, Stockwater.	5,000,000.00			
44	L. L. Harmon.....	Wilder Creek.....	8 sec. ft.	25	16N. 8W.	Stockwater.....	1,500.00			
45	S. R. V. W. U. Ass'n.....	Verde River.....	46800 a. ft.	31	3N. 7E.	Irr. Power.....	4,000,000.00			
46	S. R. V. W. U. Ass'n.....	Salt River.....	60000 a. ft.			Irr. Power.....	2,000,000.00			

ENLARGEMENTS

App. No.	Name of Applicant	Source of Appropriation	Amount Water	Diversion Point	Use	Est. Cost	No. Acres	No. Permit	No. Ctf.	Action Taken
1	U. S. Indian Service Irr. Dist. No. 4.....	White River.....	40 sec. ft.	White River Indian Res.	Domestic, Irr. Power.....	\$35,000.00	700	1		Cancelled
2	Lebanon Reservoir & Ditch Co.	Merijilda Wash.....	78 sec. ft.	27	8S. 25E.	Irr. Domestic.	3,000.00	3108		
3	Clark Standiford et al.....	Gila River.....	10 sec. ft.	8	1S. 2W.	Irr. Domestic.	20,000.00	796	2	
4	H. H. Humphreys.....	Agua Fria River....	3 sec. ft.	22	1N. 1W.	Irrigation ...	1,500.00	160		
5	Otto P. Schoenberg.....	Rucker Canyon Creek.	3 sec. ft.	28	19S. 29E.	Irr. Domestic.	475.00	35	3	
5	Lloyd H. Richards.....	Gila River.....	25 sec. ft.	15	5S. 5W.	Irrigation ...	15,000.00	1560	4	

It will be noted that these applications come from all parts of the state and are of various magnitudes, from the appropriation of springs affording one miners inch of water or less for stock water to the appropriation of large quantities of water for irrigation and power projects, some of which are of quite large proportions and for the storage of immense bodies of water. Of those above mentioned, some of the more important are:

Application for Appropriation No. 6, Reservoir Application No. 21, comprises the Lydy project in the Truxton Wash near Hackberry in Mohave County. This is not a large project. It will consist of a small reservoir to catch the flood water and into which may also be turned water diverted from the wash by a partially submerged dam some distance above the reservoir to pick up and divert the underground flow. It is expected to reclaim several thousand acres of land extending from the town of Hackberry southwestward.

Reservoir Application No. 17, proposes the construction of a dam across the Little Colorado River just above the town of Woodruff in Navajo County and below the confluence of Silver Creek with the Little Colorado. The capacity of the reservoir is to be 300,000 acre feet. It is the intention of the promoters of this project to construct another dam for a second reservoir in a natural reservoir site some ten or twelve miles east of Winslow, which is to be called the Apache Reservoir, having a capacity of 90,000 acre feet, and a diversion dam on Chevalon Creek is to be constructed to divert the waters of that stream into the Apache Reservoir for storage, the water from both these storage reservoirs to be turned into the Little Colorado River above a diversion dam to be constructed which will divert the water into canals for irrigation. The secondary application for the beneficial use of the waters from these reservoirs has not yet been filed. It is intended, however, to reclaim as much land as the water will cover, approximately 100,000 acres, and extending from a few miles west of Holbrook down the river northwestward a distance of 15 or 20 miles and to reclaim the lands around the town of Winslow. Complete surveys and plans, specifications and cost estimates of this project have not yet been filed in this office. It is the hope of the promoters of this project that the government reclamation service may take up the work and put this project into operation. If unsuccessful in that they will, no doubt, seek private capital for the work.

Reservoir Application No. 10, the Beardsley project, proposes to construct a dam for a storage reservoir on the Agua Fria River at what is known as "Frog Tanks." This reservoir will have a capacity of 146,000 acre feet. The secondary application which will specify the acreage and other uses, if there be any, has not yet been filed in this office, but it is intended and expected to reclaim approximately 50,000 acres of land similar to that of the Salt River Valley and lying adjacent to and northwest of the Marinette section of the valley. The cost of this dam and reservoir will be approximately \$2,000,000 when completed and will be financed with private capital.

Application No. 28, Enlargement Application No. 3, covers the Standiford project. This is a pumping proposition from a large well or sump at the south edge of the Gila River about 25 miles southwest of Phoenix. This project proposes to reclaim 3,473 acres of bench lands on the south side of the river and for this purpose three pumping plants will be installed; the first to boost the water through a pipe two thousand feet in length to a reservoir 60 feet above the river whence a canal will be constructed to carry water to approximately half the project; from this reservoir another lift or boost through a second pipe line two thousand feet above reservoir number two, 20 feet above reservoir number 1, whence another canal will carry water to irrigate almost half the acreage of the project; from a sump or reservoir in this canal and a third lift or boost will carry water through a pipe line five hundred feet in length to a ditch or canal 25 feet above reservoir number 2, to irrigate about two hundred acres. This project, when completed, will cost approximately \$105,000 and is to be financed with private capital. The land of the project is first class in quality but too high for gravity water from the river.

Reservoir Application No. 22, filed by the Stene Consolidated Copper Company, proposes to construct a dam and reservoir on the Williams River in the northern part of Yuma County for hydroelectric power, irrigation and mining purposes. Investigations are being made to determine whether or not it would be feasible to utilize the water for irrigation. A secondary application will be necessary in this connection which will set forth the amount of horse power to be developed and if for irrigation, then the acreage will be particularly specified and described. It is proposed to construct this work by private capital.

Application No. 49 is an interesting proposition. It proposes to pump the water from the underground flow of Centennial Wash near Harrisburg in Yuma County. The application proposes the sinking of 40 wells, or any lesser number that will furnish sufficient water to reclaim 7,308 acres of land similar to the land in the Salt River Valley. One well six feet in diameter, sunk approximately 38 feet to or near bed-rock, from which a pumping test was made to determine as far as possible something of the flow or quantity of water that might be expected, and 125 inches of water for 24 hours pumped from this well did not appreciably lower the water plane in the well. The promoters of this proposition think they will be able to develop an abundance of water to take care of the acreage mentioned above and perhaps materially increase that acreage. This is also a private enterprise being now incorporated and financed by private capital. Arrangements have been made for the work and the finances provided, as I am informed. I shall watch the progress of this project with interest as it will be one of the first enterprises of the kind in the State of any considerable size.

Application for Appropriation No. 66, Reservoir Application No. 24, filed by Joseph L. Warner, et al. proposes to construct a dam and reservoir at the mouth of a canyon leading into Cunningham Valley and in addition to sink and equip a battery of 20 wells on a line across the

Cunningham Wash and a portion of the valley from east to west from which to pump water and from these two sources it is proposed to reclaim approximately 18,000 acres of land. This project lies a few miles east of the town of Bouse and north of the Santa Fe Railroad. It is on the public domain, unsurveyed land, and it is proposed to finance the project with private capital. No wells have as yet been sunk.

Application No. 74 filed by E. Brown, Trustee, is also a pumping proposition and proposes to pump the waters of McMullen Valley lying in the northwest corner of Maricopa County and it is proposed to reclaim approximately 22,000 acres of land. This project is likewise to be financed with private capital. This project is yet in its preliminary stage.

Reservoir Application No. 9 proposes to construct two reservoirs on Frey and Rapier Canyons on the northeast slope of Pinaleno or Graham Mountain. This water is to be used for the domestic supply for the towns of Thatcher, Central and Hubbard in the Safford Valley in Graham County. The first unit or reservoir of this plant is already constructed and in operation and the second reservoir is now being constructed. It is privately owned and financed with private capital.

Application No. 72, filed by Leroy H. Richards for himself and others, proposes to pump water from the Gila River in Section 15, Township 5 South, Range 5 West, to irrigate 2038 acres of land. This is just below Gila Valley Water Company's Diversion Dam, or Gillespie Dam.

Reservoir Application No. 46, the Salt River Valley Water Users' Association has also made a reservoir filing for a dam at Mormon Flats on the Salt River to form a reservoir having a capacity of 60,000 acre feet. The estimated cost of this dam is two millions of dollars. The beneficial use stated is to supplement the present irrigation supply of the Salt River Project and for hydro-electric power. This filing is in conflict with the filing made by the Auxiliary Eastern Canal Land Owners' Association for a dam at the same place.

Reservoir Application No. 45, the Salt River Valley Water Users' Association has also made a reservoir filing for a dam at Mormon Flats as the McDowell Reservoir on the Verde River below the lower dam site of the Paradise-Verde Irrigation District, the estimated capacity of the reservoir being 468,000 acre feet, the beneficial use stated being irrigation and hydro-electric power to be used in connection with the Salt River Project. The estimated cost of this part of the project is \$4,000,000 and the power to be developed is estimated at 2,270 horse power.

Application No. 136, the Salt River Valley Water Users' Association has also filed an application for permit to appropriate from the Salt River 350 second feet of water at a point near the confluence of Pine Creek with Salt River, a few miles below the Roosevelt Reservoir, into a canal and carry the water down the stream about 8 miles. The beneficial use as named is hydro-electric power, the water to be turned back into the river. The power to be developed is stated as 4,000 horse power and the estimated cost of this project is \$700,000.

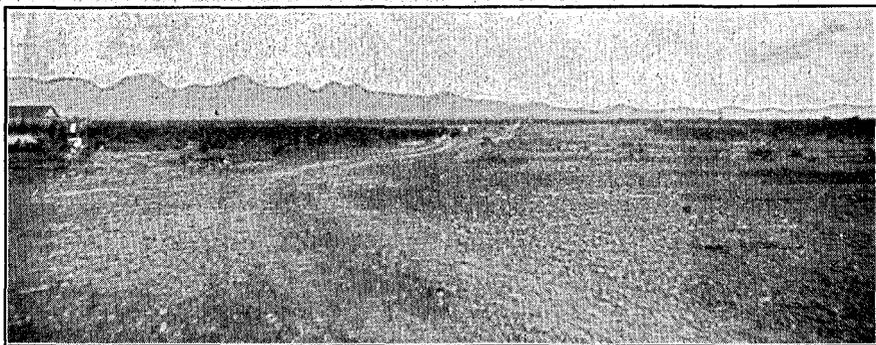
Application No. 135, the Salt River Valley Water Users' Association has also filed an application to appropriate water from Salt River above the Granite Reef Dam by means of a diversion dam and carry the water through a canal to and into the McDowell Reservoir on the Verde River. The purpose being to store the excess flood waters passing the Roosevelt Dam rendering the Salt River Project more flexible and better able to supply the demands of the stockholders of the project. The estimated cost of this part of the project is \$500,000.

IRRIGATION DISTRICTS.

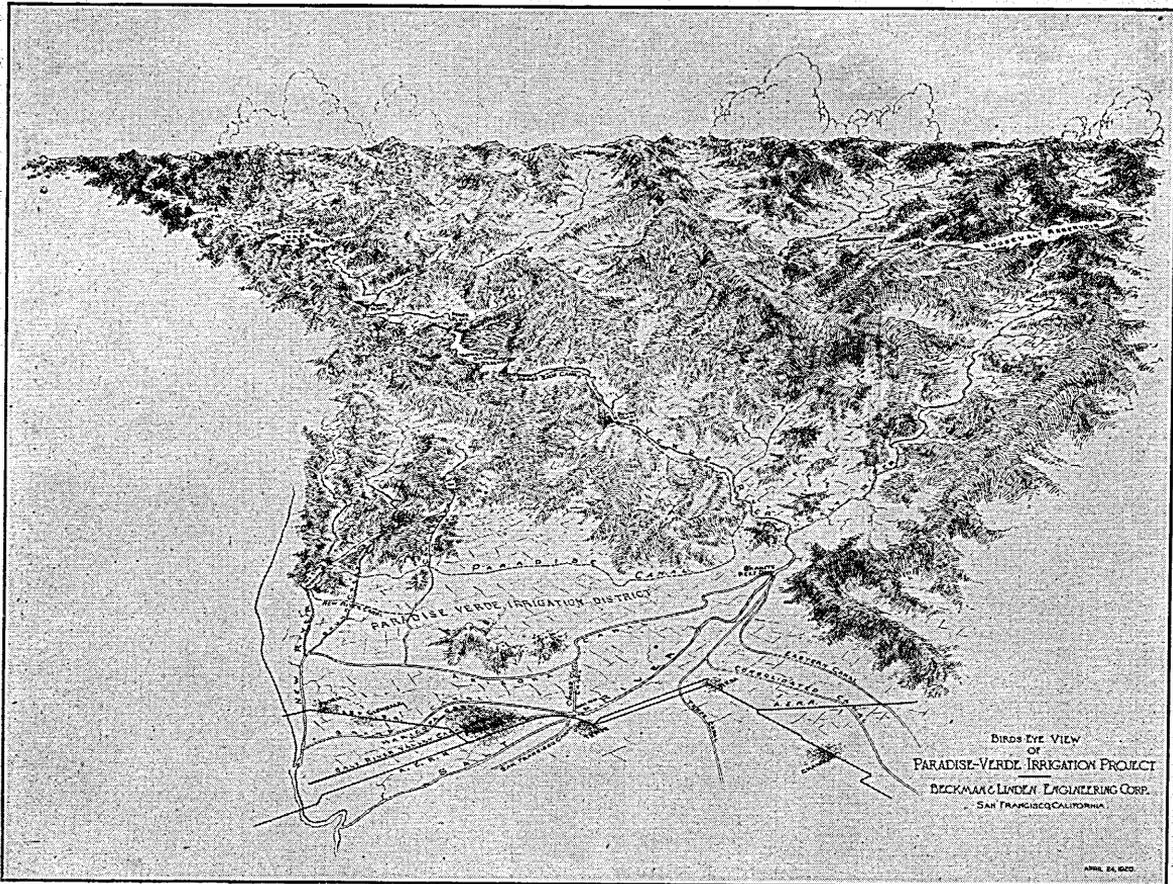
The most difficult problem that confronts those who desire to develop by irrigation any considerable tract of land is the financing of the project. The Irrigation District Law of Arizona is a good workable law but in our opinion there should be some changes made in or additions to our Irrigation District Law to bring the state and the irrigation district into closer financial relation. At the present time there are three irrigation districts which are fully organized or are in process of organization for the purpose of financing in that manner projects of great interest and value to the state. The largest and most advanced of these is the—

PARADISE-VERDE IRRIGATION DISTRICT.

This district is fully organized, has made applications to this office and been granted permits for the construction of five dams to impound water in fine reservoirs, two of them being on the Verde River, one on New River, one on Cave Creek, and one on Skunk Creek, having a total storage capacity of 736,500 acre feet and the number of acres included in this project to receive water is approximately 95,000 acres. This district lies immediately north of the Roosevelt project in the Salt River Valley and is two or three hundred feet higher and has a slightly more tempered climate. It will have a considerable acreage along the foothills especially adapted to the growing of citrus fruits. The estimated cost of this project

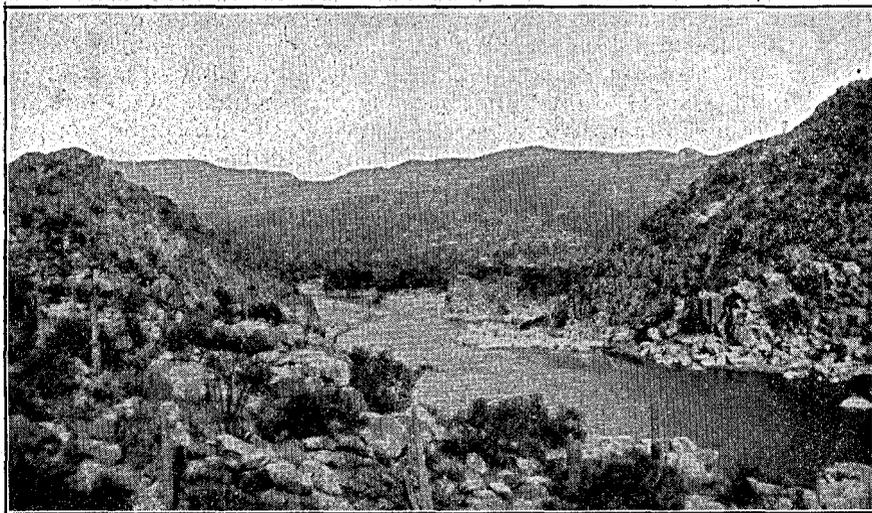


LOOKING ACROSS PARADISE VALLEY FROM SOUTH TO NORTH



BIRDS EYE VIEW
OF
PARADISE-VERDE IRRIGATION PROJECT
DECKMAN & LINDEN, ENGINEERING CORP.
SAN FRANCISCO, CALIFORNIA

4986 84 600



DAM SITE ABOVE P. H. No. 1, VERDE RIVER, APRIL 15, 1920

is \$15,000,000 and upwards and will include a hydro-electric plant on the Verde River which will develop approximately 38,000 horse power. The financing of this project is well under way and it is expected that the bonds will issue and be sold and the actual construction work commenced within the next few months. Tentative arrangements have been made for the sale of the power to be developed.

AUXILIARY EASTERN CANAL IRRIGATION DISTRICT.

This district is in process of formation and applications have been made for permits for the appropriation of water and one application to construct a dam at Mormon Flats to form the Mormon Flats Reservoir on the Salt River having a capacity of approximately 400,000 acre feet. This reservoir is to be located about midway between the Roosevelt and the Granite Reef Dam. It is intended that the water appropriated by these applications for permits shall be used upon a strip of land bordering upon and lying immediately east of the Salt River Project on the south side of the Salt River and includes approximately 60,000 acres of land of the same quality as that in the Salt River Valley and is in fact a part of it. It is also expected to develop hydro-electric power within this district but no application has as yet been filed in this office for that purpose.

THE SAN PEDRO WATER USERS' ASSOCIATION.

The San Pedro Water Users' Association is the third of the irrigation districts now in process of formation. This project includes the valley of the San Pedro River from the town of Benson up the river ten or twelve miles in Cochise County and includes within its limits the towns

of St. David and Benson. It is proposed to construct a dam across the San Pedro River at Charleston forming a reservoir to store water for the irrigation of about 35,000 acres of land. This district is well located and climatically adapted to diversified farming at an altitude of about 3,500 feet. No applications have as yet been filed in this office for any part of this project. Tentative estimates of the cost of this project show that it will probably exceed two millions of dollars.

DETERMINATION OF THE RELATIVE EXISTING RIGHTS.

As the waters of the State are being eagerly sought after by appropriators, it has become necessary to take an inventory of the water resources of the State to ascertain what water, if any, is yet subject to appropriation. To that end a determination of the existing relative rights to the use of water is necessary. Prior to the adoption of the present Water Code such determinations were made by the courts and these adjudications were principally based upon the testimony submitted by the parties to the suits, and the records of these cases rarely disclose any maps or hydrographic data that seem to be necessary upon which to base a decree which can be properly administered, and in some cases considerable confusion has resulted in the ascertainment of the exact land, in the course of the administration of the decrees, to which decreed water rights applied.

A proper determination of water rights necessarily involves many questions aside from the testimony of the water users as to what has been done in the application of water to a beneficial use. A comprehensive study of the stream and of the lands served with water, which involves considerable engineering and hydrographic work; accurate surveys of the cultivated and irrigated lands and other lands adjacent that are susceptible to irrigation; of the canals and ditches forming the irrigation system; of roads and railroads and any other thing that would in any wise affect the irrigation system, and all these accurately delineated on maps, so far as may be done, which will also show the ownership and actual individual acreage of the irrigated lands; the capacity and physical condition of the canals and ditches must be noted and taken into consideration and an observation of the methods used in the handling of the water and of the waste water, if there be any; the climatic conditions and precipitation so far as such records can be obtained; the depth, character and classification of the soil and the kind of crops produced; the length of the irrigation season; the source of water supply; the topography of the vicinity and the possibility of the storage of flood waters all combine to make a comprehensive study of the subject and necessarily entails considerable field work and much expense, yet perhaps no more expensive than the old method of court procedure, and the determination more scientifically arrived at. All this is done, not solely for the purpose of the determination of existing relative rights but to ascertain whether or not the water appropriated is all beneficially used and whether there is yet available water to enlarge the present irrigated areas where land is available. This work, as well as

the adjudication of applications for new water rights, involves a great deal of careful study and some technical training, and as the State Engineer of Oregon says in his 7th Biennial Report:

“Adjudication work must be done by some one who can devote his time to such work as a specialty. It requires judicial training, experience, and a large amount of work upon details in order to make the decrees upon the old water rights workable, lasting and full of benefit to the people.”

For the Determination of Relative Rights three petitions have been filed in this office:

CAVE CREEK DETERMINATION.

A petition was filed asking for a determination of relative rights of the users of water on Cave Creek and the matter of adjudication is now well under way. A survey has been made and a map prepared showing the irrigated lands and the canal system. The depositions or questionnaires have been sent out and were taken up at a hearing at Portal on the 15th and 16th days of July, 1920, at which time some oral testimony was taken. The record was prepared and submitted for inspection for a period of 30 days.

Some protests or contests have been filed with this office and the hearing of these contests is set for the 7th and 8th days of January, 1921.

Cave Creek heads in the Chiricahua Mountains and flows in a general northeasterly direction to San Simon Cienega. The hydrographic records of this stream show it to be flashy, floods in the winter and in the spring from melting snow, and light flow in July and August, furnishing sufficient water, if all the water could be conserved, to properly irrigate and cultivate more land than is now being irrigated; whereas, with the methods now used no one appears to have water enough. There appears to be no good location for a reservoir on or near this stream. The land has an altitude of about 5,000 feet, is favorably situated at the mouth of a canyon of the mountains and especially adapted to the growing of fruit, especially peaches and apples. A failure of these crops is rare.

The following table sets forth the rights as claimed from Cave Creek:

IN THE MATTER OF THE DETERMINATION OF THE RELATIVE RIGHTS
OF CAVE CREEK

Name	Source	Ditch	Statement and Proof filed	Irrigated Proof	Area in acres Survey
C. W. Bush & S. W. Keeling.....	Cave Creek.....	Bush & Keeling.....	7-15-20.....	23.....	19.9.....
C. N. Catlin.....	".....	Portal.....	7-15-20.....	15.....	5.4.....
Chenoweth Brothers.....	".....	Page-Gilbert.....	7-15-20.....	96.....	98.5.....
Sarah F. Herrell.....	".....	Portal-Herrell.....	7-15-20.....	100.....	107.8.....
R. L. Herrell.....	".....	Portal.....	7-15-20.....	20.....	11.5.....
S. F. Maloney.....	".....	Reed No. 3, Saunders.....	7-16-20.....	20.....	7.5.....
Emmet Powers.....	".....	Powers.....	7-15-20.....	1.....	0.5.....
Powers & McCord.....	".....	Powers & McCord.....	7-15-20.....	12.....	15.2.....
James Reay.....	".....	Portal-Reay.....	7-15-20.....	75.....	53.4.....
Minnie B. Reay.....	".....	Portal-Reay-Reay.....	7-15-20.....	16.....	8.1.....
U. S. Forest Service.....	".....	Portal.....	7-15-20.....	4.....	3.3.....
Mary P. Shirtz.....	".....	Portal-Herrell.....	7-15-20.....	80.....	91.4.....
Edward W. Stuart.....	".....	Portal.....	7-15-20.....	46.....	30.9.....
Elsie Toles & Helen L. Brown.....	".....	Tinnicum.....	7-15-20.....	12.....	5.1.....

LITTLE COLORADO RIVER.

The Little Colorado River heads on the north slope of the White Mountains and has several tributaries also taking their rise in the White Mountains. It flows northwesterly through Apache, Navajo and Cocino counties and empties into the Colorado River. Along all of these upper tributary streams farms have been made, cultivated and irrigated for a number of years. Some years ago a suit was instituted by the St. John's Irrigation Company against the Round Valley Water Storage and Ditch Company to determine the relative rights of the users of water of these two communities from the Little Colorado River. The writer was appointed Commissioner to take the testimony and make up the record in that case which was done in the summer of 1906. The decree of the Court was not finally prepared and published until April 29th, 1918. It appears now that this suit did not include the lands irrigated and cultivated on the tributaries of the upper reaches of the Little Colorado River, hence the relative rights of the farms on these tributaries were not decreed in that suit and it is for the purpose of determining these rights that a petition was filed in this office. A survey was made of these lands, Mr. W. D. Rencher of St. Johns being employed to do this work and prepare the maps. This survey has been made and the maps filed in this office. Depositions or questionnaires were sent to the water users and a hearing was had at Springerville on the 15th and 16th days of October, at which time the depositions were received and oral testimony taken. At that time it was reported that there were others interested at various places along the tributaries and the Little Colorado River itself down to and below St. Johns whose rights had not been decreed, whose lands had not been surveyed and who had not been sent the blank forms to fill out and who were interested in this determination. Blank depositions have been sent to all such claimants of whom it could be learned and the record is being prepared to be submitted for inspection at an early date.

These lands lie at an altitude of about 7,500 feet but the climate is more favorable to the production of crops at this altitude than in most localities of the same altitude and are highly productive of wheat, oats, alfalfa and wild hay.

The following table shows a list of the claimants whose rights are now in course of adjudication, and the rights claimed.

IN THE MATTER OF THE DETERMINATION OF THE RELATIVE RIGHTS
OF LITTLE COLORADO AND TRIBUTARIES

Name	Source	Ditch	Statement Proof filed	Irrigated	Area in acres
				Proof	Survey
Jay Burgess	Water Canyon	Wiltbank	10-15-20	40	40
Geo. A. Eagar	"	S. S. Wiltbank	10-15-20	150	126
Jos. H. Pearce	"	"	10-15-20	20	20
Jesse W. Slade	"	"	10-14-20	45	45
H. J. Slade	"	"	10-14-20	26	16
Joseph K. Udall	"	"	10-14-20	70	46
Henry G. Udall	"	"	10-14-20	20	20
C. E. Wiltbank	"	Water Canyon	10-15-20	20	20
Ashael Burk	Nutrioso	North Town & Lund	10-13-20	30	30
Jos. S. Burk	"	South & North Town	10-13-20	21	75
Melvin Brown	"	Private	10-14-20	40	
Wm. T. Greenwood	"	"	10-15-20	10	
Carl Hamblin	"	Lund	10-13-20	65 1/2	34.63
Willard O. Hamblin	Colter Creek	South Town, Colter Cr.	10-13-20	49.6	65.6
Marcellus Hulsey	Nutrioso	J. L. Hulsey	10-14-20	113.28	168.17
Sylvester Hulsey	"	Lund	10-14-20	38.5	99
H. G. Knowlton	"	J. L. Hulsey	"	31.87	31.87
John W. Lee	"	Colter Creek	10-13-20	72.25	101.20
Marion Lee	"	Private	10-13-20	6	
Claude Lee	"	South Town	10-13-20	144 rods	
Garland Lee	"	S. Nutrioso	10-15-20	288 rods	
Thos. R. Lee	"	Lower Town & South	10-13-20	22	32.66
David Love	"	"	10-13-20	266	208.47
William Lund	"	Lund	10-12-20	120	99.57
Lund-Lee Martin Reservoir	"	Reservoir	10-15-20		
Archibald & Lydia E. Maxwell	"	South & North Town	10-13-20	33	40.17
Mrs. Bernice Reagan Murray	Davis Creek	"	10-15-20	23	
McKay Cattle Company	Rudd Creek	Rudd Creek	10-15-20	251.74	241.69
J. E. Nelson	"	"	10-15-20	50	50
J. E. Nelson & W. T. Greenwood	Riggs Creek	Riggs Creek	"	50	17
M. L. Odell	Nutrioso	M. L. Odell	10-14-20	28.25	25.25
James P. Reagan	Davis Creek	Davis Creek	10-14-20	43	
Julius S. Reagan	Nutrioso	Reagan	10-14-20	73.35	62.81
J. S. Reagan	Reservoir	Reagan Lake	11-15-20		
Clem L. Saffell	Nutrioso	"	10-15-20	25	25
A. & B. Schuster Co.	"	Wakefield	10-14-20	92.23	92.86

IN THE MATTER OF THE DETERMINATION OF THE RELATIVE RIGHTS
OF LITTLE COLORADO AND TRIBUTARIES — (Continued)

Name	Source	Ditch	Statement Proof filed	Irrigated Proof	Area in acres Survey
C. H. Sharp.....	"	Lower Town.....	10-13-20	93.06	201.94
William Swaim.....	"	North and South Town.....	10-13-20	33.62	33.61
B. A. Thomason.....	"	"	10-14-20	1/4	
Henry Thompson.....	"	Ortega & Thompson.....		50	
Orson & Ernest Wilkins.....	"	South Town.....	10-13-20	64	88.34
O. & E. Wilkins, S. Hulsey, Wm. Lund & A. Burk	"	Reservoir.....	10-13-20		35.7
Orson Wilkins.....	Colter Creek.....	Dry Valley.....	10-13-20	63.83	61.83
Ernest Wilkins.....	Nutriosio.....	Lund & South Town.....	10-13-20	42	38
Lucinda Wilkins.....	"	N. Ntr. & Dry Valley.....	10-13-20	26	
Mary W. Wilkins.....	"	S. Ntr. & Town Ditch.....	10-14-20	2 1/2	
Parley Wilkins.....	"	Private.....	10-13-20		
M. L. & Alzina Hall.....	Fish Creek.....	Fish Creek.....	10-14-20	58.81	53.85
Ferdinand Hofman.....	"	"	10-14-20	33	26.5
Michael Hale.....	"	"		33.8	25.8
Thos. Phelps & Maud Phelps.....	Canero Creek.....	Phelps & Robinson.....	10-14-20	53.25	50.25
W. L. & Lena Robinson.....	"	Robinson & Phelps.....	10-14-20	96	96.75
Ellis W. Wiltbank.....	Fish Creek.....	Reservoir.....	11- 8-20		45.7
E. W. Wiltbank.....	"	"	10-15-20	45.7	32
J. H. Wiltbank.....	Fish Creek.....	"	10-15-20	10	9
Milford J. Wiltbank.....	Irrigation Co.....	Fish Creek.....	10-15-20	76.75	76.05
Marion Lund.....	"	"	10-15-20	28.3	28.3
Thomas R. Irwin.....	Little Colorado.....	East Side Co. & Irwin.....	10-15-20	33.1	64.1
Daniel J. Sherwood.....	"	Irwin & Alfonso.....	10-15-20	27.88	27.88
J. J. Baca.....	"	East Side & Brewer.....	10-15-20	54.65	107.65
John W. Sherwood.....	"	Alfonso, E. Side, Irwin.....	10-15-20	44.2	59.24
J. B. Jolly, Estate.....	"	Jolly.....	11- 4-20	140	
Jos. J. Jarvis.....	"	Old Isaacson.....	10-16-20	50	
C. H. Odell.....	"	Private.....	11- 3-20	300	
C. E. Wiltbank.....	Water Canyon.....	Water Canyon.....	12- 9-20	11	
Edmund Nelson.....	Nutriosio Creek.....	Nutriosio Ditch.....	12-11-20	90	
Marcellus Hulsey.....	Little Colorado.....	Reservoir.....	12-15-20		
Fred T. Colter.....	Nutriosio Creek.....	N. Nutriosio Town.....	12-17-20	3 lots	
Geo. A. Eagar.....	Water Canyon Creek.....	4 Reservoirs.....	12- 9-20		
J. W. Lee, T. R. Lee, C. H. Sharp.....	Colter Creek.....	Jarvis Reservoir.....	12- 9-20		
McKay Cattle Company.....	Rudd Creek.....	3 Reservoirs.....	11-11-20		

RECEIPTS

1919	Fees	Examining Applica- tion	DISTRIBUTION					Refund	State Treasurer	Remarks
			Recording						Deposit	
			Acceage	H.P.	Other Uses	Clerical Work	Miscel- laneous			
July.....										
August.....										
September.....	\$ 3.00	\$ 3.00								
October.....	6.00	6.00								
November.....	57.00	18.00	\$ 34.00		\$ 5.00			\$ 66.00		
December.....	100.00	42.00	42.00		15.00			100.00		
1920										
January.....	133.68	33.00	54.48		45.00			133.68		
February.....	70.60	21.00	19.20		30.40			70.60		
March.....	431.73	72.00	287.73		72.00			431.73		
April.....	745.04	30.00	697.04		15.00	\$ 3.00		745.04		
May.....	259.46	21.00	217.26		21.20			259.46		
June.....	399.17	66.00	231.97		100.00			399.17		
July.....	156.91	21.00	129.71		5.00			156.91		
August.....	162.55	39.00	83.25		35.00	5.30		162.55		
September.....	305.02	60.00	223.52		20.00			305.02		
October.....	645.50	21.00	89.60	\$443.50	90.00			635.46		
November.....	525.81	33.00	373.81		80.00	5.00	\$10.04	525.81		
December.....	361.60	201.00	33.60		125.00			361.60		
									\$4,353.03 Total receipts to December 31, 1920.	

FINANCIAL STATEMENT.

From June, 1919, to June 30, 1920.

	Disbursements	Receipts	Balance
Appropriation		\$15,000.00	
Fees		2,205.68	
Salary, office	\$ 5,674.30		
Expense, office	504.51		
Salary, field	2,347.50		
Expense, field	109.50		
Supplies and Postage, office.....	129.83		
Supplies and Postage, field	104.34		
Office Rent	30.00		
Printing and Binding.....	1,092.48		
Photo Supplies	2.85		
Auto and Upkeep	874.10		
Miscellaneous	43.43		
Total of	\$10,912.84	\$17,205.68	\$6,292.84

From July 1, 1920, to December 31, 1920.

Balance		\$ 6,292.84	
Appropriation		15,000.00	
Fees		2,147.35	
Salary, office	\$ 3,655.75		
Expense, office	184.88		
Salary, field	3,759.00		
Expense, field	23.50		
Supplies and Postage, office.....	255.35		
Supplies and Postage, field	32.23		
Freight and Express	1.89		
Printing and Binding.....	142.52		
Photo Supplies	31.81		
Auto Expense	15.00		
Miscellaneous	24.50		
Total of	\$ 8,126.43	\$23,440.19	\$15,313.76

Special appropriation for collecting data for the
 adjudication of the Gila River.....\$10,000.00
 Operating expenses to Nov 30, 1920..... 4,541.77

\$ 5,458.23

NOTE:—If the salaries for two engineers and two assistants collecting data for this adjudication were charged against this special appropriation the entire sum would now be exhausted. These salaries are included in the above general statement.

GILA RIVER.

A petition has been filed in this office for the determination of relative rights on the Gila River and its tributaries. The Gila River enters the State of Arizona from New Mexico and flows across the State in a generally westerly direction, and empties into the Colorado River on practically the same parallel of latitude as that on which it enters the State. It has many important tributaries, the most important of which are the Salt River, the San Francisco River, which also rises in New Mexico, Bonita Creek, the San Carlos, San Pedro, Hassayampa and the Agua Fria rivers. There was a special appropriation of \$10,000 made in the Water Code Act for the commencement of the work of determining the rights on the Gila. This work is now in progress. Hydrographical surveys are being made as rapidly as the appropriation will permit and the work will be pushed along as fast as possible, consistent with the proper study of the subject. In this connection I desire to say that we have been furnished, through the kindness of Mr. Herbert O. Clotts, Chief Irrigation Engineer of the Indian Service, with township maps or plats prepared by the Indian Service in the years 1913 and 1914 of the irrigated and cultivated lands along the Gila River and its tributaries which have been of great value to us in checking up this work. We have also been furnished hydrographic data by the United States Geological Survey showing the run-off of the river itself and of various tributaries, and all of these are being compiled and new measuring stations are being fixed where a more accurate checking up of the water flow will be obtained.

WATER SUPERVISION.

The fundamental proposition that the waters belong to the public being accepted as true, we must recognize the fact that while there may be sufficient water for our needs at this time, ere long there will not be enough to go 'round, if water be sought after in the future as it has been during the past year. A cursory survey of the water situation over the State of Arizona brings to mind the advice given by Mrs. Means to her son Bud, in the Hoosier Schoolmaster, "get aplenty while you're gettin'," has apparently been accepted by people as good advice and especially in making appropriations of water and we are persuaded that a more orderly system of distribution and public control of the waters of the state would have a tendency to lessen private monopolies. The old rule of "first in time, first in right", take all you can and keep all you take, should be modified so that the man first in time shall be limited to the amount of water he may actually apply to a beneficial use.

In the earlier days of irrigation in this state and territory when water was plentiful and farmers few, and the appropriation of water cost nothing but the trouble of taking the water upon the land, it was extravagantly used in many localities and the habit has been persisted in by many who have claimed a right to take all they want regardless of their needs or that of others. While each appropriator should have the full amount of

water necessary for his rightful needs, subject always to prior rights, waste of water should not be permitted and only a general authorized supervision and control will be adequate to curtail and eventually prevent waste.

CONCLUSION.

In this report I have attempted to set forth, in as much detail as I have felt justified, the workings of this office during the time of its existence, as well as the mentioning of a few of the more important irrigated sections and projects in the state at the time of the creation of the Water Code. It will be noted that no mention has heretofore been made of the segregation of lands under the Carey Act. There has been no application filed in this office by or on behalf of any Carey Act project, though there is one proposed project in the state that has made some filings of maps, etc., with the State Land Board under the Carey Act. This project proposes to utilize the water of the Hassayampa River and to reconstruct the old Walnut Grove dam or build a new dam at the old site to reclaim several thousand acres of land in the proximity of Hot Springs Junction. This project has been brought to our attention only incidentally by inquiries made concerning it.

I take this opportunity also to attest to the keen and far reaching interest which you, as Governor, have taken, not only in this department but in the matter of reclamation of lands and the conservation of the water resources in general to beneficial use, and not only in this State but in the entire west and particularly the Southwest where there are great power possibilities as well as great possibilities for the reclamation of arid land.

Respectfully submitted,

W. S. NORVIEL,
State Water Commissioner.