RURAL ELECTRIFICATION ADMINISTRATION

The San Luis Valley Rural Electification Cooperative, Inc., was recently organized in the Valley, financed by a 100% loan from the Rural Electrification Administration secured by a chattle mortgage on all the lines and equipment, its revenue coming from electrical energy delivered to its members. The loan is to be paid back over a period of 25 year payment plan.

There is now built and under construction 420 miles single phase equipment, which is practical for household use and small motor use. It will handle a 5 H. P. motor. It can be used for sawing wood, grinding feed, and will run a small pumping plant.

However, for heavy work, such as operating an irrigating plant, it requires a three phase equipment. For this purpose the Colorado Power Company has extended its lines into the farming district between Monte Vista and Center and now has 50 plants in operation capable of handling the pumps for irrigation.

Some of these surface wells are producing 3 second feet and are irrigating 80 acres of row crops. The cost is slightly more than the cost of operating a tractor for pumping.

ARTESIAN WELLS

The artesian flow of water in this division has become such an important factor in the development of the natural resources of the San Luis Valley that it would seem proper that space in our annual report should be given.

The first wells that we have any knowledge of in the San Luis Valley were brought in some time in the year 1885. One of these was on the ranch of Gov. W. H. Adams. It was 90 feet deep and had a flow of 5 gallons per minute. It is still flowing at that rate. This marked the beginning of the artesian well activities in the Valley. In 1887, the Bucher Well in East Alamosa was brought in at a depth of 932 feet and produced 350 gals. per minute when first drilled, but its flow has depreciated some in later years.

According to an inventory made in 1936 by the Joint Water Investigating Committee in connection with the Colorado, New Mexico - Texas Controversey, there were 6,070 flowing artesian wells in the San Luis Valley which have an aggregate discharge of 119,000 acre feet. During the past three years, 1937 to 1939, 250 wells have been drilled which increase the discharge to 140,000 acre feet.

The greater part of this discharge is used for irrigation of row crops, gardens and sprinkling. The balance is used for household purposes and live stock. This supply of pure water is of inestimable value to the rural population, giving a constant supply the year round.

The City of Alamosa operates a municipal plant which is supplied by five deep wells, flowing into a cement reservoir and is pumped from there into a high tank which is the source of supply of those who are patrons of the plant, through mains throughout the City. One of these wells recently brought in at a depth of 1,100 feet, normally discharges 260 gallons per minute, but by the use of a booster pump, it can be made to produce 600 gallons per minute.

Another deep well in the City, at 1,125, which was drilled through the cap rock, is a heavy producer. The City well casing rests on top of the cap rock.

When the new City well is being pumped, all the shallower wells within a radius of 500 feet practically stop flowing.

Decrease in head of the artesian wells is materially reduced when wells tapping the same sand strata are drilled in the locality. This is true in the City of Alamosa where its municipal supply from its 5 deep wells have depreciated fully 50% and it is anticipated another well will be required to take care of the City's needs.

The City of Alamosa has 250 private wells within the city limits. In addition, the municipal plant furnished water to 650 householders. This service by the municipality runs from low of 6,395,000 gallons in February to high of 12,800,000 gallons in July.

Alamosa, through the use of private wells and the municipality uses 2,354 acre feet annually.

Other towns in the Valley use:

Center	1,017	acre feet
La Jara	1,130	" "
Sanford	725	" "

and Monte Vista with 720 private wells uses 3,484 acre feet.

There are many artesian wells around the edge of the artesian belt that do not flow, some of them coming within a few feet of the surface and which, if pumped, produce an inexhaustable supply.

The Valley proper is 60 x 90 miles, not all of which produces artesian flows. As you get nearer the edge of the trough, the flow becomes lighter, until finally the flow will not come to the surface.

The area covered by the artesian belt covers the entire trough of the Valley, or about 1,450 square miles.

In drilling an artesian well 1,000 feet deep, as many as 10 different water bearing sands are encountered. The deeper ones produce the stronger flows.

Generally there is very little fluctuation in the flow of the deeper wells. Although, in some of the shallower wells, the flow seems to be influenced by the different seasons, especially in mid-summer, when irrigation water is lowest, and ground water is reduced to lower levels.

There are a number of artesian springs in the Valley, some of them flowing 25 second feet and producing annually 47,450 acre feet. Water users under these springs have a perpetual water right, as they do not vary their flow.

Artesian wells in the Valley have a flow ranging from a trickle to 650 gallons per minute. The artesian wells in the Valley outside the cities and towns average 14.5 gallons per minute.

A number of artesian wells brought in near Hooper and Mosca are highly impregnated with marsh or methane gas. This gas has no connection with oil.

A number of artesian wells brought in around Hooper produce gas in sufficient quantity to supply the homes with gas for heating, cooking, and lighting. The water where gas exists is not palatable for drinking purposes.

A deep well near Hooper, put down to a depth of 4,308 feet, prospecting for oil or gas, struck a tremenduous flow of artesian water, with a temperature of 120 degrees. They abandoned the well as an oil prospect, but have commercialized it for recreational purposes, and as a result have a fine swimming pool.

An analysis of this gas shows 83% methane or marsh gas. Some wells produce 1,500 cu. feet per day.

A number of the larger wells and many that are used for domestic purposes restrict their flow when not needed. If allowed to flow unrestricted, their potential annual discharge would be 150,000 acre feet.

A number of the larger producers are capable of irrigating 40 acres of row crops. The cost of a 1,000 foot well, cased all the way down is approximately $2,500 and will produce 250 to 300 gallons per minute.

PUMPING FROM SHALLOW WELLS

During the period of deficiency in irrigation water, the standby irrigation pumps are put into operation. At the present time, there are between 500 and 600 wells in the Valley which are called upon to take care of such an emergency as existed in 1934 and the present year.

These wells, at a depth of 30 to 60 feet, are producing from 100 to 1,600 gallons per minute, will average 850 gallons or approximately 2 second feet. If they were all operated at one time, they would produce 1,800 acre feet per day, but on account of expense of operating, they are used only in emergency, or used on row crops or high value crops, such as potatoes or vegetables.

The equipment consists of 16" to 30" galvenized pipe, perforated at the bottom, a centrifugal pump, a cheap automobile or tractor for power and will cost $500 to $1,000 according to size of pipe and depth of well.

The larger producers will easily take care of 80 acres of row crops. In the territory where sub-irrigation is used, complaints are made that the excessive use of these pumps lower the water table from 5 to 9 feet, during the mid-summer. However, the water table has come back to normal the next spring.

A movement is on to have the legislature pass a law controlling the operation of these wells, and will ask that they be placed under jurisdiction of the State Engineer.

RAIN MAKER

A new departure in irrigation is having a tryout among the water users of the Valley in the Rain maker. A number of these plants, around ten, have been installed and while it's still in the experimental stage, those who have used them are very enthusiastic over the results. One user irrigated a crop of 124 acres of sugar beets, using only 2 sprinklings to mature the crop, which yielded 15 tons per acre at a cost of 30 cents per hour, for gasoline, sprinkling 2 acres per hour. Two men were required to change the pipe. It requires only about 20 second inches of water to supply the equipment. Allowed to sprinkle one hour, before moving, the soil is saturated to a depth of 6 inches.

An 80 acre field of potatoes, where the rain maker was used, produced 270 sacks per acre, while the average crop was around 200 sacks. The cost of the equipment, including 1000 feet of pipe and the necessary sprinkler, is $800 to $1,000. An old V8 auto supplies the power.

It is not practical to sprinkle any but row crops or high money crops, owing to the excessive cost. It is estimated that the cost of operation will run from 20¢ to $1.50 per acre inch.

It is claimed for the rain maker a saving of 40% in water, a better germination of seed, control of blight and insects, saves cost of levelling the land, and eliminates ditches through the field.

CLIMATOLOGICAL DATA 1939

PRECIPITATION

	Alamosa	Cumbres	Garnett	Manassa	Del Norte
Jan.	0.81	no report	0.87	0.44	0.87
Feb.	0.23	"	0.09	0.38	0.22
Mar.	0.11	"	0.35	0.24	0.26
Apr.	0.34	"	0.53	.00	0.26
May	0.24	"	0.43	0.14	0.04
June	0.25	"	No report	Trace	No report
July	2.12	"	0.85	0.14	0.12
Aug.	0.44	"	0.95	0.26	1.87
Sept.	0.52	"	0.28	0.53	0.61
Oct.	0.25	"	0.01	0.48	0.16

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CLIMATOLOGICAL DATA 1959

TEMPERATURE

		Alamosa	Garnett	Manassa	Del Norte
Jan.	High	45.	46.	42.	45.
	Low	-25.	-20.	-15.	- 8.
	Mean	11.2	17.	11.4	19.2
Feb.	High	57.	43.	38.	33.
	Low	-24.	-22.	-22.	-14.
	Mean	8.2	12.	9.8	12.
Mar.	High	64.	68.	62.	60.
	Low	-18.	-12.	-18.	- 5.
	Mean	31.2	34.	32.	33.8
Apr.	High	72.	74.	78.	70.
	Low	10.	12.	11.	15.
	Mean	46.4	45.6	45.3	46.3
May	High	78.	85.	80.	76.
	Low	25.	25.	26.	29.
	Mean	52.9	52.	52.6	52.4
June	High	87.	85.	86.	85.
	Low	26.	25.	25.	25.
	Mean	59.	52.	59.1	58.
July	High	89.	91.	90.	88.
	Low	37.	38.	36.	40.
	Mean	65.9	62.2	64.3	64.7
Aug.	High	85.	91.	86.	84.
	Low	37.	34.	36.	38.
	Mean	61.4	61.5	61.4	61.7
Sept.	High	84.	89.	82.	82.
	Low	25.	26.	27.	35.
	Mean	55.	58.	55.	58.
Oct.	High	72.	76.	72.	72.
	Low	8.	11.	10.	17.
	Mean	40.	44.	41.	45.

SNOW SURVEY

1959

Snow Course	Location	Elevation	Depth of Snow			Water Content		
			3-1-59	4-1-49	5-1-59	3-1-59	4-1-49	5-1-59
Wolf Creek Pass	South Fork	10,000 ft.	67.2"	61.7"	40.4"	19.7"	23.1"	18.5"
Upper Rio Grande	Rio Grande Reservoir	9,350	19.	0.0	0.0	4.4	0.0	0.0
La Veta Pass	La Veta Pass	9,300	45.8	22.6	0.0	10.3	7.2	0.0
Silver Lakes	Silver Lakes	9,600	26.	12.0	0.0	4.4	3.3	0.0
River Springs	Conejos River	9,300	29.2	16.4	0.0	6.6	4.6	0.0
Ute Ridge	Rio Grande Reservoir	9,700	20.9	0.0	0.0	5.1	0.0	0.0
Summitville	Wightman Creek	11,500	54.	55.6	47.8	14.1	15.2	16.7
Cumbres Pass	Los Pinos Creek	10,000	80.7	46.8	13.1	22.8	18.3	5.6
Santa Maria Reservoir	South Clear Creek	9,700	16.6	0.0	0.0	5.7	0.0	0.0

RESETTLEMENT PROJECT

The Project Office was first set up in January, 1936, at Alamosa, Colorado. Land was optioned by the Government largely from The Bowen Drainage District and The Waverly Drainage District, which had acquired this land by tax title for delinquent drainage and general property taxes.

All of the land owned by the Government, by an agreement, pays an amount of money equal to the taxes that would have been assessed on the same property if it were under private ownership, including irrigation water and drainage assessments. Practically all of the money paid for land and shares of ditch stock was paid to the Irrigation companies and drainage districts, thereby permitting these districts and water companies to reduce their indebtedness and annual operating assessments and thus further reducing the assessments on all of the land within the districts. The County, Schools and State were also paid their proportionate share of the delinquent general property taxes.

A total of 4640 acres were bought in Rio Grande County within the Bowen Drainage District and a total of 4760 acres in Alamosa County within The Waverly Drainage District. This acreage was divided into 80 acre units, excepting a few quarter sections which were cut by the Empire Canal. In these cases 160 acres were allotted to these units. There were also one or two other exceptions.

At the present time, the Government has under option, additional lands totaling approximately 5,000 acres, which are to be similarly divided and improved. This work will, perhaps, not begin before the latter part of 1940.

The Government will allot one and one-half to two shares of Commonwealth Irrigation Company stock to each 80 acres under that canal and six shares of Monte Vista Water Users Association to each unit under that canal. In addition to that, the Government has acquired an appropriation of 18.75 cubic second feet of water out of Spring Creek which will be used as a supplemental supply on some 20 units.

All of the land purchased is adequately drained but very little of it was in production and none of it was properly leveled. The total acreage is now divided into 106 farm units on which construction work has been practically completed on 86 units. This construction consists of a dwelling, barn, poultry house, privy, artesian well, woven wire and cross fences, and corrals.

It is planned that the remaining 20 units will be improved with a similar set of buildings in the year of 1940. Thirty-nine units have been landscaped, which consists of planting a windbreak, ornamental trees, shrubbery, including berry bushes. A temporary nursery is maintained for replacement.

At the present time 4240 acres have been leveled, heavy leveling equipment being used to bring the surface to within 2 inches of grade. The greater part of this acreage was leveled with Government-owned equipment under force-account, (day labor), but since June 30, 1939, leveling has been carried on under private contract. It is intended that all of the 106 units will be finished during the year 1940. This land was all covered with chico and greasewood, which had to be removed prior to leveling. All of the acreage is chiseled to a depth of 12 to 16 inches before it is turned over to the individual farmer. The development, so far, has required the construction of about 43 miles of irrigation ditches and laterals, 5 headgates; 90 diversion boxes; 102 bridges and culverts. Cost of de-brushing was $2.00 per acres. Cost of leveling from $18 to $20 per acre.

The first 40 units were built by the Government under force-account and are leased to the farmers for the minimum rental which will be increased as the income from the farm justifies it. As soon as the income from the farm warrants its sale, the farmer now occupying it will have the opportunity to enter into a lease and purchase contract.

Forty-six units have already been sold to their occupants under a 40 year repayment plan on a Lease and Purchase contract. The interest will be 3% on this. These 46 units, on which construction work has been completed, were constructed by private contractor and paid for by a loan made to the individual which is also amortized for the 40 year period at 3% interest.

Each of the 86 farmers now living on units have been made an operating goods loan covering his needs for subsistence, feed, seed, purchase of livestock and equipment with which to operate his farm. This loan is to be repaid within two to five years with 5% interest. This loan is based on a Farm and Home Plan which is, in effect, a budget, the expenditure of which is supervised by the Farm and Home Management personnel maintained on the project. It is required of each family that an accurate farm and home record be kept of all income and expense.

The first farming was done in 1938 on a total of 420 acres. In 1939 crops were planted on 69 units covering approximately 2,500 acres. These crops consisted almost altogether of a grain nurse crop with 15 acres of alfalfa and, on the average, 25 acres of sweet clover on each unit. Because of the rawness of the land and the extreme drouth that existed this year, production was very light. However, the production totaled about 25,000 bushels of grain, 430 ton of hay, 4,000 sacks of potatoes and 750 acres of crop for pasture.

After the farms have been fertilized, largely with sweet clover and alfalfa, the proposed cropping plan is as follows:

15 acres of alfalfa
15 acres of clover, with grain nurse crop
15 acres of potatoes and/or beets
15 acres of peas and/or other vegetable crops
15 acres of clover pasture
5 acres of farmstead, roads, and other land waste.

It is intended to carry sufficient livestock to consume all of the feed produced on the farm. To supplement the income from crops it is intended to have sheep, and dairy products, poultry products and gardens are especially stressed, so that the families will have more security in their subsistence needs and that relief payments of any kind will not be necessary.

Most of the families on the project were moved from the so-called "dustbowl" of eastern Colorado and from other counties east of the Rocky Mountains, including the San Luis Valley. All of these families had exhausted their resources, including their credit. Generally their selection was approved in the county from which they came, after considering the age, ability, experience, initiative, and character. Each family was permitted to make its own selection of a unit from those available at the time.

It will be noted from this description that these are family sized units, large enough to occupy the time of the entire family and yet not so large that hired help will be necessary other than, perhaps, a slight amount during the harvest season. It will also be noted that the cropping plan above outlined is in agreement with the best practises in the area. No new and untried methods are being advocated.

It is further planned that during the coming year, a demonstration farm will be operated which is typical of the units developed on the project. It is hoped that this farm will be operated by the Colorado Experimental Station and Extension Department.

A community building was erected near the center of that part of the project lying in Alamosa County, which contains four school rooms, two meeting rooms, kitchen and other facilities, including three rooms occupied by the project Management and personnel. The building was made available to the local School Board which operates it the same as schools are operated in any other rural district. The building was made available for their use without cost to the District.

The intended purpose of this project is to demonstrate the feasibility of the size of the farm unit, the value of farm and home management supervision; and whether or not it is more profitable to properly develop and

improve a farm before it is used or after the individual has acquired sufficient capital to do so, and further to demonstrate other methods that might be followed by other lending agencies, including private companies, to make loans to individuals who do not have the required amount of money for down-payment.

Total paid out by the Government for land:

8,400 Acres	$ 80,727.50
For Water	109,757.00
	$190,484.50