

LIST OF ANNUAL REPORTS PUBLISHED

DEPARTMENT OF THE INTERIOR

UNITED STATES RECLAMATION SERVICE

SALT RIVER PROJECT

ARIZONA

HISTORY OF THE PROJECT

FOR THE

CALENDAR YEAR 1916.

It was finally decided that funds would not be allotted from the Reclamation Fund to cover the cost of this work.

Flood Control of Cave Creek

The flood waters of Cave Creek are a constant menace to the water users whose lands are subject to overflow from that source. Also the canals and structures of the Reclamation Service are damaged at each occurrence of this flood. The flood of September 9, 1916, was especially destructive and it was decided to investigate the head waters of this Creek to find, if possible, some means of storing this flood water or diverting it into New River where it would do little if any damage.

Several possible diversion canals or channels were investigated, all of which proved to be unfeasible, due principally to the high cost of construction.

Two dam sites were found near Cave Creek Station, one in Section 29 and the other in Section 31, Tp. 6 N., R. 4 E. A third dam site was investigated about four miles north of the Phoenix mine in Section 33, Tp. 7 N., R. 4 E. It was decided that none of these schemes were feasible as the advantages to be gained would not justify the expenditure.

E. E. Panten, Surveyman, made the surveys and estimates, under the direction of the Construction Engineer.

Silt Survey of Roosevelt Reservoir

A survey to determine the amount of silt deposited in the Roosevelt Reservoir was made during the winter of 1914-1915. Since

that time two wet seasons with large floods have come and gone. The first survey did not show any very definite or dependable results, due most probably to errors in the original topography of the reservoir site. With the expectation that another survey would show some definite results when compared with the first one, authority was obtained for making a second silt survey during the summer and fall of 1916.

Accordingly a survey party was sent to Roosevelt during the latter part of July. This party was to do the engineering work necessary for the construction work at the Dam and put the rest of its time on the silt survey. This party consisted of O. J. Schieber, Assistant Engineer, H. H. Jaseon, Instrumentman, O. Kitchen, Rodman and O. Berg, Chairman.

The old Reclamation Service launch was repaired and put in service. Active work on the lake was started August 5th, locating the old monuments and checking the triangulation of the previous survey.

The monuments of the first silt survey were all concrete blocks and were placed approximately on the 235 ft. contour. The high water of January 1916 which stood from 1½ to 2 feet above these monuments was accompanied by severe wave action and as a result about 40 of these monuments were found washed out, or not found at all.

The replacing of these monuments at higher elevations and on original sounding lines required that the original location of the monument be determined by intersection from two monuments which were still in place. This reestablished the old sounding line and then it was only necessary to put in the new monument at higher elevation on this same line.

The washed-out monuments were finally all replaced and the necessary angles turned to tie these new monuments to the triangulation system. The old triangulation system was then checked at several places for azimuth and distance. A traverse with long courses was run from Roosevelt up each arm of the reservoir. This showed an error of five minutes on the Tonto end, a distance of 8 miles. The traverse on the Salt arm showed an error of six minutes in a distance of about ten miles. Distances between triangulation stations were checked at Roosevelt and at both ends, and found to check very closely with the triangulated distances.

Observations were made on both the Sun and Polaris to check the meridian used on the original silt survey. These observations checked against each other and show courses of the first triangulation survey to be 25 minutes in error. Records of that survey show that the wrong latitude was used in making the solar observations, which would account for the larger part of the error.

In order to make this survey comparable with the first one, it was necessary to take the soundings along the same lines. The same general method was used in making the soundings. Party started taking soundings in October. Two transits were used, one to keep the launch in line and the other set up on some adjacent monument to turn the intersection angle.

Two men were used in taking soundings, one to run the launch and the other to operate the sounding tape. Care was taken to entirely stop the motion of the boat before lowering sounding weight, so that tape would be plumb when weight touched bottom and tape was read.

Soundings were not taken when wind or waves were strong enough to carry boat off line and give an erroneous intersection or an inclined tape. A 15 lb. sounding weight was used on the end of a 300 ft. steel tape. The sounding tape was operated with reel bolted to the front end of the boat. Intersection angles locating soundings were taken on this reel.

The previous survey was taken at a much lower elevation of the lake. The section taken at that time began and ended at the edge of the water. Sufficient soundings and levels were taken this time to give complete cross-sections. Soundings were taken from 100 feet to 500 feet apart, depending on the topography of the bottom.

The elevation of the lake was obtained each day from the hydrographer at Roosevelt and the soundings were then referenced to the lake elevation.

The triangulation system was extended up both ends of the lake so as to include the 225 ft. contour. The previous survey section ended at contour 150. Six new cross-sections were taken on Tonto end and seven on Salt end. Most of these were taken with level and tape as they were above the lake end.

The making of the survey extended from August 8th to December 31st. This was due mostly to the fact that nearly one-half of the party's time was spent on construction work at Roosevelt Dam. The boat also gave considerable trouble at one time delaying the work one month, due to a broken crank shaft.

Additional work was also required due to the fact that about 40 monuments had to be replaced and 10 to 12 new ones established.

This practically doubled the amount of work contemplated when survey was started. Bad weather on the lake also delayed the soundings several days at a time. The time was not lost however, as the men were used in the office figuring on triangulation work.

The soundings have not been plotted as yet, but comparison of notes with old topography show a maximum of 10 to 12 feet of silt at Tonto end of lake, and about 15 feet on Salt end. These areas are from one-half to three-fourths of a mile long. Comparison with sections of first silt survey show about 10 feet additional silt next to dam. No estimate of silt can be made until cross-sections are plotted and compared with former silt survey sections.

The field work was all completed at end of year with exception of a few days work obtaining new elevation on the reestablished monuments. Most of the computations on the triangulation system have been made. A few errors in the old computations were discovered and this made it necessary to refigure the entire triangulation. All that remains is to finish the triangulation computation, plot the cross-sections and compare with the previous silt survey and the original topography and then compute the acre feet of silt in the reservoir. A new map of the triangulation system should be made as so many of the old monuments have been moved, changing courses and distances. When this is done bearings of courses should be corrected to agree with correct meridian. This work will be completed early in 1917.

Preparation of State School Land Farm Units

The field work on this item was commenced August 7, 1916, and pursued in the following manner:-