

Sept 8, 1934

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DETAILS OF MOENCOPI WASH FLOOD

Lower Moencopi Dam, F. P. 24²~~3~~, situated near Tuba City, Arizona, on the dry wash from which it derives its name.

The structure was designed and constructed to handle a volume of approximately 10,000 second feet, this being ample to care for any previous normal flows as recorded by gauge on the wash some five miles above the dam site.

On August 27, 1934, there was considerable rain in the Moencopi water shed, and the wash began running that evening, increasing to a slight extent by morning of the twenty-eighth. At about twelve, noon, on the twenty-eighth, a wall of water from eight feet in height came down at a considerable velocity and, being on top of the previous flow, caused a flood of large proportions. The flow was estimated at 15,000 second feet.

I was a witness to this flood as it went over the dam and realized that the structure was in no way capable of handling such a volume through the spillway. In a short time this stream was running from three feet above the crest of the wings, being almost nine feet in height above the spillway. Due to this fact, the left end section of the bank outside the dam was flooded over and gradually eroded down and back from the left end wing, leaving a gap of some sixty feet between the dam and bank.

On the right end the water broke off the wing and a section of weir was destroyed to the elevation of the under-lying shale. Approximately forty-five feet of masonry must be replaced at this point, averaging one foot below the weir crest and to a height as shown on the original plan.

Due to the break on the left end, water was allowed to flow into the ditch and left some four feet of silt through its entire length. This must, of course, be cleaned before water is available at the present inlet elevation.

At the toe of the dam, the shale was washed away leaving the footing exposed, and it is feared that future over-flows will cut further unless steps are taken to prevent this. The baffle wall is intact and in good condition, but a rock blanket placed above the wall was entirely destroyed.

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The inlet pipe was not damaged, but lies at present in the line of flow through the broken bank. Both gates are in good shape. The sluice box itself is partially under-mined, and one side has been damaged through failure of the concrete.

It is recommended that the following be done towards restoring the project to operation and preventing recurrence of the past damage:

To reconstruct the right end wall as shown on the original plan, and in addition place a small wing at 90° as extra protection against recurrence of break.

To lengthen the spillway on left end approximately sixty feet, bringing the wing up to an elevation of 4140 as shown also on plans. It is believed that with this increased spillway and additional height of wing, no further trouble will be encountered through washing of the dirt bank.

To change the inlet structure and sluice gate from their present position to a location back of the left wing as shown on the plan.

To pour concrete and place heavy rock along the down stream toe in an effort to prevent cutting of the shale.

To line the ditch for some ten feet below the gate and clean same for the entire length to the original grade.

NOTE: Attached are estimate of costs on this recommended work and photographs of flood.

J. H. Dorroh, Jr.
J. H. DORROH

Public Works
P. P. 242, Lower Moencopi Wash

District No. 5
Albuquerque, New Mexico
September 8, 1934

Commissioner of Indian Affairs
Washington, D. C.

Dear Sir:

Lower Moencopi Wash Project, P. P. 242, which has been under construction for some time and nearly completed, was damaged by floods which occurred on August 27, 1934. Records of the discharge of the Moencopi Wash show that floods in the amount of 9,000 cubic feet per second might be expected. The spillway of the dam was designed for 10,000 cubic feet per second. Torrential rains fell on the watershed of the Moencopi Wash on the evening of August 27 and again on the morning of August 28. About noon on the 28th there were some eight to nine thousand feet of water flowing in the Moencopi Wash. Shortly after this an additional 8-foot wall of water came down the wash, causing one of the largest floods in the history of this area, estimated at 20,000 second feet. This is also evidenced by the fact that the flood waters reached a new high water mark at the highway bridge over the Moencopi Wash. At this point, water was at an elevation of the middle guard rail of the bridge and made a complete change of channel below the highway.

One of the engineers was witness to this flood as were a number of Indians who have resided continuously in this area and they have declared that this is the largest flood that they have ever witnessed.

No damage was done to the main structure; however, protective work was being placed at the west end of the dam, as contemplated in the original plans. Due to the fact that this was not completed, the floods cut around the end of the dam which will require an additional 60-feet of masonry to close the aperture. The material on which the new construction will rest is identical with that on which the dam was built and will only require the construction of a wall four feet in height. In addition to this it will be necessary to move the head gate structure downstream 60 feet and concrete line the canal section for at least 100 feet. Considerable silt was deposited in the canal which should also be removed at this time.

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Funds in the amount of \$5,675.00 are needed to make the necessary repairs to flood damages to prevent further erosion of the west bank. It is hoped that funds can be made available at an early date, thus eliminating further expense in the rehabilitation of this project.

The following is an estimate of the cost.

Estimated Yardage on Left End Wall - 90 Cu. Yds. @ \$15.00	\$1350.00
Estimated Yardage on Right End Wall - 10 Cu. Yds. @ \$15.00	150.00
Estimated Cost of Sluice-box & Inlet Structure	600.00
Estimated Cost of Changing Gates	100.00
Estimated Cost of Changing Pipe	200.00
Estimated Yardage Concrete along Toe of Dam 15 Cu. Yds. @ \$25.00	775.00
Estimated Cost of 100' Lined Ditch, - 2 1/2" @ \$3.00	300.00
Estimated Yardage Silt to be Removed - 6200 @ .30	1860.00
Engineering & Contingencies	340.00
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SUM TOTAL	\$5675.00

Very truly,

GAB/KD
cc H. V. Clotts

H. C. NEUFFER
Supervising Engineer