

**HARQUAHALA FRS
FCD GAGE ID# 5128**

STATION DESCRIPTION

LOCATION – The dam is located in western Maricopa County near the Salome Highway exit on Interstate Highway 10. The dam is north of the highway. The gaging station is located on the outlet of the dam at the eastern end of the structure. The structure is on the upstream side of the Central Arizona Project canal in the area. Latitude N 33° 32' 54", Longitude W 113° 05' 52". Located in the SE1/4 NW1/4 NE1/4 S05 T2N R8W in the Burnt Mountain 7.5-minute quadrangle.

ESTABLISHMENT – The stage gage was established on March 1, 1994.

DRAINAGE AREA - 102.3 mi²

GAGE – The gage is a pressure transducer type instrument. The PT is located on the outside of the outlet tower of the principal outlet at elevation 0.38 feet gage height or 1,375.27 feet NAVD 1988.

There are seven staff gages on the dam at the principal outlet. Two are painted on the outlet tower and five are individual staff gage posts mounted to the upstream face of the dam. All staff gages are within 0.07 feet of the indicated reading, levels of January 7, 2015.

There are no crest gages at this location.

ZERO GAGE HEIGHT – Zero gage height is defined as the zero on the staff gage, elevation 1,374.887 feet NAVD 1988, updated with survey data from January 7, 2015.

HISTORY – A precipitation gage was installed on September 15, 1993 by the District. A recording level gage was installed on March 1, 1994. The PT diaphragm was surveyed and found at 0.76 feet gage height on June 17, 1994. On April 1, 1997, the PT was surveyed and found to be at 0.38 feet gage height. No known physical change to the PT diaphragm elevation is known. The differences may be due to survey differences between Donaldson's June 1994 survey and Lehman's April 1997 survey and the SCS subsidence survey of 1991, and FCD's McClain-Harbers survey of March 1996. Therefore, the old PT level is used between March 1, 1994 and September 30, 1996. Beginning with Water Year 1997, the PT diaphragm is taken to be 0.38 feet gage height. Since no significant impoundments were recorded during this period, these discrepancies are considered relatively unimportant to the gage record. Elevation data changed from NGVD 1929 to NAVD 1988 in 1997. The relation is as follows. 0.00 gage height = 1,372.94 feet NGVD 1929 = 1,374.81 feet NAVD 1988.

REFERENCE MARKS –

Near the principal outlet

RM-1 is a SCS Brass Cap marked 'A61' near station 1040+00. Elevation 46.402 feet gage height, or 1,421.289 feet NAVD 1988, levels of January 7, 2015.

RM-2 is a SCS Brass Cap marked 'A62' near station 1050+00. Elevation 46.700 feet gage height, or 1,421.587 feet NAVD 1988, levels of January 7, 2015.

RP-1 is the top right corner of the gate control support block at the top of the dam. Elevation 48.038 feet gage height, or 1,422.925 feet NAVD88 levels of January 7, 2015.

Near the Emergency Spillway

RM-3 is a SCS Brass Cap marked 'A51' near station 940+00. Elevation 46.81 feet gage height, or 1,421.62 feet NAVD 1988, levels of April 1, 1997.

All references are SCS brass caps for subsidence monitoring that are along the entire length of the dam.

CHANNEL AND CONTROL – The principal outlet for the dam is the outlet tower works located at the east end of the dam. The outlet is a 48-inch diameter pipe culvert. Higher flows occur through the emergency spillway.

PRINCIPAL OUTLET / EMERGENCY SPILLWAY –

The principal outlet is a 48-inch diameter culvert pipe. Its length is 465 feet. The culvert invert elevation is 1,369.46 feet NAVD 1988 or –5.43 feet gage height. There are two intake points on the tower. The first is an 18-inch diameter orifice with invert elevation of 1,375.46 feet NAVD 1988 or 0.57 feet gage height. The second point is the top of the uncontrolled outlet at the top of the tower that is at elevation 1,389.39 feet NAVD 1988 or 14.50 feet gage height.

The emergency spillway crest is at 1,410.59 feet NAVD 1988 or 35.7 feet gage height. The auxiliary spillway is located approximately 2 miles west of the principal outlet. The spillway width is about 150 feet.

The top of the dam elevation is at about 46.7 feet gage height or 1,421.59 feet NAVD 1988.

RATING –

The current discharge rating is Rating #1 computed by T. M. Donaldson in June 1994. The culvert rating was computed by HY8 for the uncontrolled outlet. The emergency spillway rating was computed from a weir analysis using $C=2.9$.

The current capacity rating is Rating #2 developed from DTM by GC Card in April 1997.

DISCHARGE MEASUREMENTS – The principal outlet could be evaluated from the outlet channel downstream of the dam. It would have to be done with the gated outlet at the dam fully open.

POINT OF ZERO FLOW – Flow begins through the outlet at 0.57 feet gage height. Flow begins through the emergency spillway at about 35.7 feet gage height.

FLOODS / SIGNIFICANT IMPOUNDMENTS – An event occurred on October 27, 2000 with a peak stage of 21.47 feet and volume of 492 acre-feet.

REGULATION – The dam is regulation for the natural flows from the mountains to the north and east.

DIVERSIONS – None known

ACCURACY – Fair to good

JUSTIFICATION – Monitor water levels behind Harquahala FRS for public safety.

UPDATE – July 5, 2016
D E Gardner