

AGUA FRIA RIVER AT BUCKEYE ROAD (MC 85)
FCD GAGE ID# 85307 (5403)

STATION DESCRIPTION

LOCATION – Gage is located on the downstream side of the Buckeye Road (MC85) bridge approximately 1/2 mile east of Dysart Road. The instrumentation is attached to the downstream side of the bridge. Latitude N33° 26' 5.8", Longitude W112° 19' 56.7". Located in the NW1/4 NE1/4 S14 T1N R1W in the Tolleson 7.5-minute quadrangle.

ESTABLISHMENT – The gage station was established on October 12, 1988.

DRAINAGE AREA – 2,404 mi² (via USGS Streamstats), of which 1,459 mi² is controlled by New Waddell Dam, 191 mi² is controlled by Cave Buttes Dam, 90 mi² is controlled by Adobe Dam, 164 mi² is controlled by New River Dam, and 247 mi² is controlled by McMicken Dam.

GAGE – The gage is a pressure transducer type instrument located in conduit on the eighth pier from the left bank, near the center of the downstream channel. The PT is at 0.26 feet gage height, levels of March 17, 2016.

There is one staff gage at this location. It is a painted staff gage on the downstream side of the second support from the west end of the bridge. The apron under the bridge covers the bottom 0.2 feet of the staff gage.

There is a crest gage at this location on the same pier as the transducer gage. The pin is at elevation 0.49 feet gage height, levels of September 19, 2019.

ZERO GAGE HEIGHT - Zero is defined as zero feet on the painted staff gage. Elevation is 954.718 feet NAVD 1988.

HISTORY – The USGS formerly operated a gage at this location. The District installed its gage in October 1988. Formerly, the gage datum was set to 0.0 feet, even though it is at –1.20 feet on the inside staff gage. As of October 1, 1999, the base value was adjusted and is set to read in gage height. A single crest stage gage, range to approximately 4 feet gage height, was installed on January 12, 2000. Crest stage gage was destroyed sometime in 2001. Bridge work was done in late 2001 and early 2002 to strengthen the piers supporting the bridge deck. Construction did not affect gage operations. Gage and stilling well were removed for construction on September 6, 2003. Gage reinstalled on July 13, 2004 in a different configuration. Survey of gage cross section and instrumentation on August 30-31, 2004. Previous to the gage being removed due to construction, gage datum was based upon the USGS datum on the staff gages at the stilling well. Since the stilling well and staff gages no longer exist, the new datum will be

based on the painted staff gage. The new datum is 1.03 feet higher than the previous datum. Therefore, zero gage height in the new datum is -1.03 feet in the old datum.

Photographs suggest that sometime between 2009 and 2011, the painted staff gage was lowered by approximately 1.0 feet. However, the gage record will reflect this datum change as of January 6, 2016 to coincide with the change to ALERT2 data format.

REFERENCE MARKS –

RM-AFBKY is an FCD brass cap located on the top of the right bank on the south side of Buckeye Road along the control road. Elevation 14.592 feet gage height and 969.310 feet NAVD 1988, levels of March 17, 2016. Northing: 886025.44 feet; Easting: 572642.12 feet.

RM-2 is a brass tablet in the west end of the downstream side of the road bridge on the sidewalk. This reference found during the March 17, 2016 survey is assumed to be ERM6 from the 1992 survey, but the cap was not marked as such. The elevation is 17.777 feet gage height and 972.495 feet NAVD88, levels of March 17, 2016.

RM-‘R-3’ is an FCDMC brass cap located on top of the levee just downstream of the bridge on the right bank. Elevation is 14.393 feet gage height and 969.111 feet NAVD88, levels of March 17, 2016.

RP-1 is a bolt located on the east side of the PT pier. Elevation is 0.372 feet gage height, or 955.090 feet NAVD88, levels of March 17, 2016.

RP-2 is the bottom of the channel just south of the pressure transducer, painted white. The elevation is 0.165 feet gage height and 954.883 feet NAVD88, levels of March 17, 2016.

RP-3 is the north most bolt on the power pole directly south of the pier with the pressure transducer, painted white. The elevation is 1.884 feet gage height and 956.602 feet NAVD88, levels of March 17, 2016.

CHANNEL AND CONTROL – The channel in the reach of the gage is relatively straight up and downstream. The bottom is natural with increasingly larger and denser vegetation of desert broom, willows, and cottonwoods. The bottom material directly under the bridge, (the gage location) is primarily concrete. About 40 feet downstream from the bridge, the channel is primarily sand and various size cobbles. The right bank is uniform with soil cement stabilization. The left bank is less defined just downstream of the bridge. The channel is channelized throughout the gage reach.

The channel is control at higher levels and discharges. Below about 1.5 feet gage height, no good control exists. The channel is a very wide, almost flat channel.

RATING – The current rating was developed from an HEC-RAS model provided by the Agua Fria River Re-delineation study. The model was run to over the existing 100-year discharge. It is rating number 4, effective for Water Year 2016 and forward.

DISCHARGE MEASUREMENTS – Low flow discharge measurements could be made by wading downstream from the bridge because flows at the bridge may be swift due to the low roughness. High flow discharges may be measured from the Buckeye Road bridge as safety permits.

POINT OF ZERO FLOW – At the gage cross section, it is at about 0.1 feet gage height, levels of March 2016.

FLOODS – A discharge of 10,274 cfs at 3.74 feet gage height occurred on September 8, 2014. It is the largest flow recorded since installation.

REGULATION – New Waddell Dam approximately 25 miles upstream is a major water storage dam. There are several other dams on tributary rivers and streams that also regulate inflow to the Agua Fria River. Cave Buttes Dam regulates flow on Cave Creek, Adobe Dam regulates flow on Skunk Creek, and New River Dam regulates flow on New River, which conveys water from all three drainages to the Agua Fria River south of Glendale Avenue. Trilby Wash, as regulated by McMicken Dam also contributes water to the Agua Fria River north of Bell Road.

DIVERSIONS – New Waddell Dam accepts water from and diverts water to the Central Arizona Project canal.

ACCURACY – Poor for flows less than approximately 2,000 cfs. Fair for flows to 10,000 cfs. Good for higher flows.

JUSTIFICATION – Monitor flows in the Agua Fria River for road closures at Lower Buckeye Road and for contributions to the Gila River downstream.

UPDATED – October 25, 2023
ES Thomas