

Wood River near Alda, Nebraska 06772000

LOCATION

Latitude and Longitude

40.85463, -98.47415

Road Log

At the left downstream bank, the shelter is about 9 ft. north of the northeast wingwall of the bridge over Wood River, 0.8 miles south on State Link 40C from west side of Alda, NE or 4.5 miles north of Interstate 80.

Nearby Features

1.8 miles upstream from old north channel of the Platte River, 7.6 miles upstream of USGS streamgaging station Wood River at Grand Island, NE 06772100, and 26.2 miles upstream from present confluence with the north channel of the Platte River.

Equipment Details

Recording Gage

A Design Analysis Water Log Series Model H-522+V2 data logger and H-3553-15 compact bubbler are housed in a 48" CMP shelter on a steel frame on the left upstream bank. The ¼ inch bubble line is encased in 1¼ inch black plastic pipe and galvanized pipe which is anchored in a sandpoint that has been driven into the streambed towards the upstream middle of the bridge deck.

External Gage

The reference gage is a type-A wire-weight gage mounted on the downstream side of the bridge near the left bank. Check-bar elevation is 16.36 ft., gage datum, levels of 6-20-2018.

Bench Mark and Reference Marks

R.M. #5 (basic) is a Department of Roads brass cap set in the southeast concrete wing wall of the bridge over Wood River (#00496) on state link 40 C South of Alda, NE. Elevation of 15.16 ft. gage datum established by levels on 4-20-2009.

R.M. #6 is a chiseled square on upstream corner of left concrete bridge wingwall. Elevation 15.26 ft. gage datum was established by levels on 6-20-2018.

R.M. #7 is a chiseled X on the South upstream leg of the gage house. Elevation 15.385 ft. gage datum was established by levels on 6-20-2018.

R.M. #8 is a standard bronze tablet in a concrete post 31.5 ft. downstream from the northeast corner of the gage house. Elevation 11.885 ft. gage datum was established by levels on 6-20-2018.

Gage datum is 1,895.88 ft. above the North American Vertical Datum of 1988 as determined by the NDNR Survey Crew on August 7, 2014. Previously the gage datum was 1,895.92 ft. above NGVD 29, which was determined by GPS on April 17, 2009 by the NDNR.

Hydrology

Drainage Area

628 square miles.

Channel and Control

The natural channel in the vicinity of the gage is fairly winding with medium banks composed of sand and sandy clay. The channel is straight for a distance of about 20 ft. above the gage and 150 ft. below the gage, with a medium bank on the right and a medium bank on the left. There is an elevation of 12.36 ft. on the right downstream bank and an elevation of 11.94 ft. on the left downstream bank, levels of 04-09-2009. The elevation of the bottom of the bridge deck is 13.16 ft. gage datum, levels on 04-09-2009. A road and embankment, which cuts across the flood plain next to the gage, will prevent river overflows from bypassing the gage. The bank, which rises above the bed, is fairly resistant to erosion as a result of grass and shrubs. The sandy bed is fairly stable at low to moderate stages in the vicinity of the orifice. Minor channel shifts may be noted at low stages due to sandbar movement. At high stages the bridge and the channel are the control.

Discharge Measurements

Low or medium-flow measurements are made by wading in the vicinity of the gage. High water measurements are made from the downstream side of bridge.

Floods

ACTION STAGE: 9.0 FT

FLOOD STAGE: 10.0 FT

MODERATE STAGE: 11.0 FT

MAJOR STAGE: 12.2 FT

Values provided by NWS as of November 6, 2018.

Minor lowland flooding occurs in pastures and farm lands at a river stage of 10.0 feet. At a river stage of 11.0 feet the left bank overflows and water floods lowlands and farm lands. Record flooding occurs at 12.2 feet river stage and State Highway 30 upstream of the site acts as a strong restriction to flood crests.

Extremes for Period of Record

Maximum discharge since 1953 is 1,630 cfs June 16, 1967 (gage height 12.22 ft.); maximum gage height since 1953 is 13.61 ft. March 16, 2019, 1,460 cfs; minimum daily discharge of zero many times during period of record.

Point of Zero Flow

Not permanent due to deteriorating control conditions. A PZF of 3.59' gage height was obtained on August 9, 2018.

Winter Flow

Flow may be affected by ice November through March.

Regulation and Diversions

There are numerous small pump diversions for irrigation above station and flows are affected by return flows from gravity irrigation upstream.

Accuracy

Records are fair to good, except for estimated record which is poor.

Establishment and History

On October 30, 1953, a standard (Lincoln District) 48 inch C.M.P. well and shelter with recorder was established by D. T. Hartley of the U. S. Geological Survey.

On June 24, 1977 use of stilling well was discontinued and a servo-manometer with 35 ft. range was installed with the orifice mounted in a sandpoint located on the right bank near the intake pipes.

Crest stage indicator gage was installed on May 17, 1982.

The Nebraska Department of Water Resources assumed operation of the gage as of October 1, 1994.

On March 14, 1995 a Fisher-Porter digital recorder, Stevens A-35 water-stage recorder and servo-manometer with 35 ft. range was removed.

Isco 4230 Bubbler Flow Meter with recorder was installed on March 14, 1995. The bubble line is encased in 1 ¼" steel pipe to sandpoint or muffler on the right bank.

The Nebraska Department of Water Resources name was changed to the Nebraska Department of Natural Resources as of July 1, 2000.

On Nov. 20, 2007 the ISCO 4230 Bubbler Flow Meter with recorder was removed.

On Nov. 20, 2007 the Design Analysis Water Log Series Model H-500XL and a Goes Satellite Antenna were installed.

On March 25, 2009 the 48 in CMP shelter was moved 0.4 miles north to the left downstream side of bridge near wingwall. The bubble line is encased in 1 ¼" plastic pipe to a sandpoint or muffler near the downstream left bank.

On September 15, 2011, the bubble line and sand point were moved to the upstream left bank of the state link 40C road bridge. Also a Water Log Series Model H-3553 pressure/bubbler sensor and H-355-DES-2 desiccating air drier unit were installed. The Water Log series Model H-350 lite pressure measurement system, safe purge and the nitrogen pressure tank were removed.

The NDNR Survey Crew established the gage datum to the North American Vertical Datum of 1988 on August 7, 2014. The gage datum is 1,895.88 ft. above NAVD 88.

On July 23, 2019 the Design Analysis Water Log Series Model H-500XL and H-222 were replaced with an H-522+V2.

Revision History

Original description prepared: 05-25-1956 by D. T. Hartley

Revised: 04-14-1977 by K. H. Calver

Revised: 05-16-1978 by K. H. Calver

Revised: 07-01-1982 by K. H. Calver

Revised: 06-08-1990 by R. B. Swanson

Revised: 07-24-1995 by D.L. Studnicka

Revised: 04-14-1997 by D.L. Studnicka

Revised: 09-08-1999 by D.L. Studnicka

Revised: 04-30-2001 by D.L. Studnicka

Revised: 10-18-2002 by D.L. Studnicka

Revised: 09-21-2006 by D.L. Studnicka

Revised: 12-18-2007 by D.L. Studnicka

Revised: 03-09-2009 by D.L. Studnicka

Revised: 04-20-2009 by D.L. Studnicka

Revised: 01-13-2012 by S.R. Kolar

Revised: 01-22-2013 by P.J. Breitkreutz

Revised: 01-26-2016 by P.J. Breitkreutz

Revised: 10-04-2018 by P.J. Breitkreutz

Revised: 10-01-2019 by P.J. Breitkreutz