

Keya Paha River near Naper, NE. 06464900

LOCATION

Latitude and Longitude

42.916667, 99.097222

Road Log

On left upstream bank 23 ft. left of bridge abutment, 3.3 miles south of Naper on 470th AVE., and 8.6 miles upstream from mouth.

Nearby Features

The confluence of the Keya Paha River and the Niobrara River is approximately 8.6 miles downstream.

Establishment and History

Original installation consisted of wire-weight gage on downstream side of bridge established by U. S. Geological Survey employees, G. W. Caughran and A. F. Pendleton Mar. 21, 1957. Daily gage-height readings obtained, and discharge computed starting Dec. 11, 1957, discharges were estimated for the period Oct. 1 to Dec. 10, 1957.

Recording gage in standard (Lincoln District) 48" corrugated metal well and shelter established May 2, 1958 by U. S. Geological Survey under supervision of J. A. Anderson.

On October 21, 1964, use of stilling well was discontinued and a bubble gage was installed with the orifice attached to the left downstream bridge pier. Due to silting problems at this location, the orifice was moved to the left upstream pier and mounted on the stream ward side of the pier on upstream side of the bridge. The orifice was installed in a sand point at the left upstream pier on April 29, 1969.

A concrete deck girder bridge was constructed 70 ft. downstream from gage during the summer of 1977.

On July 21, 1977, wire-weight gage was removed from old overhead truss bridge, a temporary staff gage was installed at left bank 5 ft. downstream from gage and orifice was mounted in sand point near staff gage.

On July 22, 1977, old bridge was removed.

On Nov. 14 and 15, 1977, temporary staff gage was removed, wire-weight gage was mounted on downstream handrail of new bridge, and manometer orifice was installed in flushable sand point mounted on downstream end of left pier near wire-weight gage. Buried section of orifice line was cased in ½" conduit. Sandpoint can be flushed with a pitcher pump.

The 48 in. CMP shelter was moved August 1986 to left upstream road shoulder 28 ft. left of bridge abutment.

The 48 in. CMP shelter was removed June 25, 1990 and a 5' x 5' Corps of Engineers type metal shelter was installed June 26, 1990 on left upstream bank 23 ft. left of bridge abutment. The bubble line is encased in 1 $\frac{1}{4}$ " plastic pipe, to sand point or muffler near the left downstream bank.

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

On May 8, 1995, Fisher Porter Digital recorder was removed.

On May 8, 1995, Stevens A-35 water-stage recorder was removed.

On May 8, 1995, Stevens A-71 water-stage recorder was installed.

On July 22, 1997, Water Gage II 2.25 was installed.

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

On September 15, 2003, Design Analysis Water Log Series Model H-500XL data logger and H-331 encoder were installed.

On April 26, 2005 the Satellite Goes antenna was installed.

On May 26, 2005, a Design Analysis H-222SE GOES transmitter was installed.

On September 21, 2011 an NWS tipping bucket rain gauge was installed.

On March 14, 2012, Stevens A-71 water-stage recorder, Water Gage II 2.25, and Safe Purge Bubbler system were removed.

On March 14, 2012, a Design Analysis H-3553 Bubbler was installed.

On May 22, 2013 a new orifice line was installed just upstream of left bridge pier.

On August 14, 2013 the Design Analysis H-3553 Bubbler was removed.

On August 14, 2013 a Model H-350 Lite Design Analysis Gas Purge System was installed.

On October 28, 2013 the H-350 Lite Design Analysis Gas Purge System was removed and a Design Analysis H-3553 Bubbler was installed along with a New Design Analysis H-500XL Data Logger.

On December 7, 2020 the H-500XL Data Logger and H-222 Goes Transmitter was removed and replaced with a H-522+ Data Logger.

On November 3, 2021 the H-522+ Data Logger, H-3553 Bubbler, Yagi antenna, and GPS antenna was removed and replaced with a Sutron Satlink 3 Data logger / Transmitter, Sutron Geo-Satellite antenna with GPS, and a Sutron Radar Level Sensor.

Hydrology

Drainage Area

1,630 sq. mi. approximately.

Channel and Control

From the bridge and for considerable distance in both directions the channel is generally very straight and regular with low banks covered with trees and brush. The channel is confined to a width of 90 to 100 ft. The bed of the stream is composed of soft shifting sand and has no permanent control. The range in stage is generally small with overflow seldom occurring, however, a dike has been placed along the right bank to prevent lowland flooding.

Discharge Measurements

Wading measurements usually made in vicinity of bridge. High-water measurements can be made from downstream side of bridge. Measuring conditions are good.

Extremes for Period of Record

Maximum discharge for period of record, 9,280 cfs July 1, 1962 (gage height, 10.91 ft.) maximum gage height, 13.34 ft. Mar. 23, 1960 (backwater from ice).

On March 14, 2019 there was a rain and snow melt event with a maximum discharge of 24,730 CFS with a gage height of 15.11 ft.

Point of Zero Flow

PZF of 4.02' was found on July 20, 2022.

Winter Flow

Complete to partial ice cover during the winter months. Flooding seldom occurs except during extreme rainfall during summer months.

Regulation and Diversions

No regulation. There are numerous diversions for irrigation during the summer months, considerably reducing normal flow.

Accuracy

Open-water records should be fair to good with sufficient measurements to define shifts. Records for winter period would be poor.

https://nednr.nebraska.gov/RealTime/

Equipment Details

Recording Gage

Sutron Satlink 3 Data logger / Transmitter, Sutron Geo-Satellite antenna with GPS, and a Sutron Radar Level Sensor.

External Gage

The outside reference gage is a type-A wire-weight gage mounted on downstream side of bridge near left bank. Check bar elevation is 18.62 ft., gage datum. Levels of 5/18/2021.

Benchmark and Reference Marks

Datum of gage is 1684.307 ft. above NAVD88, as determined by levels of August 6, 2014.

R.M. #6 is chiseled square on upstream corner of left concrete bridge abutment. Elevation, 13.72 ft. gage datum. Levels of 5/18/2021. **Origin**

R.M. #7 is chiseled square on upstream corner of right concrete bridge abutment. Elevation, 14.13 ft. gage datum. Levels of 5/18/2021.

R.M. #8 is lag bolt in tree 15 ft. north of downstream guard rail and 51 ft. downstream on left bank. Elevation 13.50 ft. gage datum. Levels of 5/18/2021.

R.P. #3 is head of ¼" bolt set 0.4 ft. below top of downstream handrail at station 111. Elevation 19.31 ft. gage datum. Levels of 5/18/2021.

R.M. #9 is a chiseled X in the Southeast gage house base leg. Elevation, 14.66 ft. gage datum. Levels of 5/18/2021.

WWCB Elevation, 18.62 ft. gage datum. Levels of 5/18/2021.

Revision History

Revised 05-15-58 by J. A. Anderson Revised 04-02-70 by A. E. Woitalewicz Revised 11-18-77 by H. D. Stephens Revised 01-04-89 by D. L. Studnicka Revised 12-20-90 by D. L. Studnicka Revised 02-05-93 by D. L. Studnicka Revised 09-09-95 by D. L. Studnicka Revised 02-15-96 by D. L. Studnicka Revised 12-29-97 by D. L. Studnicka Revised 10-17-00 by D. L. Studnicka Revised 11-17-03 by D. L. Studnicka Revised 08-16-06 by D. L. Studnicka Revised 06-29-09 by D. L. Studnicka Streamgage Description Keya Paha River near Naper, NE. 06464900

> Revised 03-27-12 by G. H. Lindeman Revised 01-31-13 by J.E. Sedlacek Revised 01-28-14 by J.E. Sedlacek Revised 01-20-15 by J.E. Sedlacek Revised 04-17-15 by J.E. Sedlacek Revised 11-07-18 by J.E. Sedlacek Revised 07-23-19 by J.E. Sedlacek Revised 12-16-20 by J.E. Sedlacek Revised 07-25-22 by J.E. Sedlacek