Niobrara River near Nenzel, NE.
06459025

LOCATION

Latitude and Longitude

42.805722, 101.123083

Road Log

On left bank 60 ft. upstream of State Highway Spur 16F bridge abutment 9 mi. South of Nenzel, NE.

Nearby Features

The confluence of Medicine Creek and the Niobrara River is approximately 6 miles upstream from gage and the confluence of the Snake River and the Niobrara River is approximately 17 miles downstream.

Establishment and History

On August 7, 1997, a staff gage was established. Staff gage was mounted on an old bridge pier at the site on the left bank 75 ft. upstream of highway bridge.

Miscellaneous measurements were made at the site in 2008.

Gaging Station was established on July 2, 2008, by the Nebraska Department of Natural Resources.

On 11-12-2008 gage datum was lowered 0.80 ft. from 2690.80 ft. to 2690.00 ft. above National Geodetic Vertical datum of 1929.

On 6-26-2013 the Design Analysis H-350 Lite, Safe Purge gas bubbler system with Nitrogen tank was removed.

On 6-26-2013 a Design Analysis H-3551 Bubbler was installed.

On 6-11-2014 a CSI gage was installed.

On August 5, 2014, the gage datum was established at an elevation of 2,685.546 ft. above the NAVD 88.

On May 15, 2020, the staff gage was extended with an upper portion which reads up to 6.74’.

On October 18, 2022, the Design Analysis H-350Xl logger, H-222 Goes transmitter, and H-3551 bubbler were removed and replaced with a Sutron Satlink III and Radar.

Hydrology

Drainage Area

Undetermined.

Channel and Control

The channel is straight for about 120 ft. upstream and several hundred feet downstream from the gage. The right bank is a high bluff covered with several varieties of trees and brush and is not subject to overflow. The flood plain on the left downstream bank is approximately 100 ft. wide and several hundred feet long; covered with grass, shrubs, and trees; and is subject to overflow only in extreme floods. There is always one channel with high velocities and uneven depths. The bed of the stream is shale and rock, with deposition of sand, and is fairly stable at all stages.

Channel control downstream of the staff gage and orifice at all stages. The stream bed is made up of shale and rock, with deposition of sand, and is fairly stable at all stages.

Discharge Measurements

Normal flows are measured by wading in the vicinity of the gage. High flows can be measured from the bridge.

Extremes for Period of Record

On March 25, 2019, there was a maximum instantaneous discharge of 5468 cfs, with a gage height of 6.39 ft. This was from snowmelt and rain upstream.

Point of Zero Flow

Variable. Changes with conditions of scour and fill.

Winter Flow

Flooding or complete ice cover should seldom occur.

Regulation and Diversions

There are a number of diversions for irrigation, the principle one is Box Butte Reservoir near Hemingford, NE (06455000).

Accuracy

Discharge measurements are normally made once every four weeks. Records are fair to good.

Equipment Details

Recording Gage

Sutron Satlink III is located in a 4’x4’ steel shelter set on a steel frame 60 ft. upstream of the highway bridge. The OTT Radar level sensor is mounted to the old bridge abutment by the staff gage.

External Gage

The reference gage is a staff gage (0 – 6.74 ft.) mounted on the left bank.

Bench Mark and Reference Marks

R.M. #1: is a chiseled X on upstream shoreward corner of the 3-inch channel iron on the gage house base support. Elevation is 10.38 ft., gage datum, from levels 8/29/2023.

R.M. #3: is a Nebr. Dept. of Roads bronze tablet set in concrete handrail 20 ft. left from bridge abutment on North upstream side of bridge. Elevation is 31.46 ft. gage datum, from levels 8/29/2023. **Origin**

R.M. 4: is a chiseled square in the northeast corner of the concrete walkway that leads down to the river. Elevation is 10.97 ft., gage datum, from levels 8/29/2023.

R.P. #1: is a chiseled X on top of Staff gage steel backing 84.8 ft. Southwest of Northwest corner of the gage house. Elevation is 4.62 ft. gage datum, from levels 8/29/2023.

R.P. #2 is a chiseled arrow on the concrete guardrail on the downstream side of the bridge at station 52. Elevation is 37.30 ft. gage datum, from levels 8/29/2023.

R.P. #3 is a chiseled arrow on the concrete guardrail on the upstream side of the bridge 53.5 ft. north of the right upstream abutment. Elevation is 39.72 ft. gage datum, from levels 8/29/2023.

Elevation of the top of the staff is 6.68 ft., from levels of 8/29/2023. Staff reads 6.74 ft. a -0.06-datum correction is applied.

Elevation of the top of the CSI gage is 6.18 ft., from levels of 8/29/2023.

Datum of gage is 2,685.546 ft. above National Vertical Datum of 1988 as determined by GPS on August 5, 2014, by the Dept. of Natural Resources.

Revision History

Original description prepared on 11-12-2008 by D.L. Studnicka
Revised 04-23-2012 by Guy H. Lindeman
Revised 02-10-2014 by J.E. Sedlacek
Revised 03-04-2015 by J.E. Sedlacek
Revised 11-13-2015 by J.E. Sedlacek
Revised 4-14-2017 by J.E. Sedlacek
Revised 11-08-2018 by J.E. Sedlacek
Revised 04-11-2019 by J.E. Sedlacek
Revised 06-11-2020 by J.E. Sedlacek
Revised 12-17-2021 by J.E. Sedlacek
Revised 04-07-2022 by J.E. Sedlacek
Revised 11-07-2022 by J.E. Sedlacek
Revised 11-06-2023 by J. E. Sedlacek