

## Niobrara River above Box Butte Reservoir 06454500

### LOCATION

#### *Latitude and Longitude*

42.45971 -103.1711

#### *Road Log*

Access to gaging station is by driving west from Box Butte Reservoir Dam, on Dawes County "River Road", five miles then south on farm access road 0.5 mile or 6 miles east of Marsland, NE on Dawes County "River Road" then south on farm access road 0.5 mile.

#### *Nearby Features*

Box Butte Reservoir is downstream of the gage.

### Equipment Details

#### *Recording Gage*

Sutron CBS recorder and satellite DCP station housed in a 48-inch CMP shelter on right bank 20 feet downstream from six-foot metal culvert. Base recording instrument is Sutron CBS recorder.

Real-time data accessed through the internet: <https://nednr.nebraska.gov/RealTime>

#### *External Gage*

Chain Gage

#### *Bench Mark and Reference Marks*

Datum of gage is 4,012.47 ft. NGVD.

**R.M. No. 2, R.M. R.M.No.3, R.M. No 6, and have been DESTROYED.**

**R.M. No. 1:** Standard bronze tablet 77 feet south and 16 feet downstream from shelter. Elevation of 10.20 feet from levels dated March 23, 2017. (ORIGIN). Not Found December 3, 2021.

**R.M. No. 4:** Standard bronze tablet in a concrete post 33 feet east of lock hasp on shelter. Elevation of 8.75 feet by levels of March 23, 2017.

Elevation of 8.77 feet by levels of December 3, 2021. **Used as Origin**

**R.M. No 5 X** On Downstream top of culvert. Elevation of 6.91 feet from levels dated March 23, 2017.

Elevation of 6.92 feet by levels of December 3, 2021.

R.M. No 6 was originally established on October 6, 2008. It was an X in southeast corner of shelter base. R.M. No. 6 reported destroyed on August 22, 2014 and was not shot at that time. RM No 7 was established on March 23, 2017 at the exact same location (X in south east corner of shelter base) as previous RM No 6 and at a new elevation of 9.42.

**R.M. No 7:** established on March 23, 2017. It is an X in the southeast corner of the shelter base and has an elevation of 9.42. See also Comments on R.M. No 6.

**Chain Gage** elevation 5.10 checked by levels March 23, 2017.

Elevation of 5.10 feet by levels of December 3, 2021.

## Hydrology

### Drainage Area

1,400 Square Miles approximately.

### Channel and Control

The channel is straight for 150 feet upstream and bends to the left sharply about 50 feet below gage. Streambed composed of fine sand, which shifts moderately. The banks are low and free of heavy vegetation. The bend below the gage acts as a control for medium to bank full stages. A broad-crested concrete weir was built 20 feet below the gage in October 1954. This weir will serve as a control for low to medium stages when not silted over. Depending on frequency of high flows, the weir may become silted over and become ineffective.

### Discharge Measurements

Low and medium flow measurements may be made by wading in the vicinity of the gage. Bank full stages can be measured from access road over six-foot culvert 20 feet above gage. Water will overflow the left bank, in the vicinity of the gage, at medium stages. Overflow on both banks can be expected at high stages. Measurement of discharge when culvert above gage is beyond capacity can be made by measuring overflow across access road to culvert with a great deal of caution.

### Floods

1946-2002; maximum discharge 4,950 cubic feet per second July 28, 1951 (gage-height, 10.30 feet), from rating curve extended above 230 cubic feet per second on basis of step-backwater analysis and slope-area measurement at a gage height of 9.22 feet.

### Extremes for Period of Record

Peak discharge 4,950 cubic feet per second July 28, 1951, gage height 10.30 feet; minimum daily discharge 1.6 cubic feet per second September 26, 1953.

### *Point of Zero Flow*

Variable due to aggradations of channel. In the 2005 Water Year discharge measurements indicate PZF near a stage of 2.30 feet.

### *Winter Flow*

Partial to complete ice cover may occur during months December through March. At times channel will completely fill from blowing snow causing sharp drops in discharge or large backwater condition at gage.

### *Regulation and Diversions*

Diversions for irrigation above gage is for approximately 12,800 acres.

### *Accuracy*

Published records rated good except for those for estimated winter period, which are poor.

## **Establishment and History**

Established by U. S. Bureau of Reclamation about 1941.

1941 to October 1, 1946 twice-daily gage readings from a vertical staff at same datum.

October 1, 1946, U. S. Geological Survey assumed operation of data collecting at same datum.

November 27, 1950, a continuous Stevens recorder in a 48-inch corrugated pipe well and shelter at same datum.

The station was maintained in cooperation with USGS prior to October 1, 1994.

On November 12, 1996, a Stevens 420 level logger was installed and operated in conjunction with Stevens A-35.

48-inch CMP removed and well filled in on June 25, 1998. 48-inch CMP was separated from well and placed on a metal platform supported with steel legs on June 25, 1998.

On May 1, 2001, Stevens 420 level logger was removed and replaced with an AxSys MPU System logger.

January 27<sup>th</sup>, 2009, solar panel was taken down, and a regular power line was ran to the station to correct power failure problems.

March 27, 2013, a metal floor was installed on the station.

April 4, 2008, 13 Holes were fixed in the shelter.

March 11, 2016, the ISCO Model 4230 Bubbler Flow meter was removed from service and the gage was updated to a Sutron CBS recorder and satellite DCP station. The gage transmits data every hour in 15-minute blocks to the world.

## **Revision History**

**Original description** prepared 07/24/1952 by C.V. Burns

Revised by: E. K. Steele 08/25/1977  
Revised by: J.W. Vassos 11/09/1987  
Revised by: J.W. Vassos 02/19/1997  
Revised by: J.W. Vassos 11/17/1998  
Revised by: J.W. Vassos 11/08/1999  
Revised by: J.C.Retchless 11/15/2001  
Revised by: J.C.Retchless 02/19/2003  
Revised by: J.C.Retchelss 03/18/2005  
Revised by: J.W. Vassos 11/09/2005  
Revised by: J.Nichols 03/08/2010  
Revised by: J. Nichols 01/22/2014  
Revised by: Stjepan Figuric 01/04/2017  
Revised by: Jeff Nichols 04/18/2018  
Revised by: K. Schwager 11/29/2023