

Medicine Creek below Harry Strunk Lake 06842500

LOCATION

Latitude and Longitude

40.37165, -100.222

Road Log

Frontier County, Hydrologic Unit 10250008, on right bank, ½ mile downstream from Medicine Creek Dam and 6½ miles northwest of Cambridge, NE.

The gage is reached by driving west across the top of the dam then taking the dam superintendent's driveway at the west end of the dam. Follow the road past USBR office / mechanical shop to a locked gate. USBR key #BR 1 or DNR key #2640 is needed to unlock the gate to gain access to the road below the dam and the gage house. 50 ft. through the gate turn south and follow trail road down the hill and through the trees to the gage which is ½ mile downstream of the dam.

Nearby Features

½ mile downstream from Medicine Creek Dam

Equipment Details

Recording Gage

A Sutron SatLink 3 is connected to a Stevens A-35 graphic water-stage recorder, scale 1:6, which is equipped with graduated float tape set to agree with inside gage and U.S.B.R. encoder that has a LCD readout at the dam and computer graphics display at the U.S.B.R. operations office in McCook. The encoder is connected to the float wheel with sprocket chain. The equipment is housed in a Lincoln Standard 48" corrugated iron pipe well and instrument shelter.

External Gage

Staff Gage: Two sections of enameled staff gage attached to a 2" X 6" pressure treated plank, located at the intakes. Elevation, of upper staff plate 6.74 ft. gage datum. (Levels 7/27/2022).

Bench Mark and Reference Marks

Datum of gage is 2296.442 feet, (NAVD 88) North American Vertical Datum 1988, by levels (Bureau of Reclamation Benchmark).

The following elevations are given in feet above gage datum:

Top of culvert pipe shelter 29.0 ft.

Top of instrument shelf	24.6 ft.
Floor of instrument shelter	21.5 ft.
Well door sill	16.6 ft.
Top of concrete floor in well	-0.3 ft.

Well is connected to stream by two 3-in galvanized iron pipes, each equipped with flushing device. Lower intake has a 90° elbow and adjustable extension on outer end in stream.

The following elevations are given in feet above gage datum:

CL of upper intake pipe (well end)	2.0 ft.
CL of lower intake pipe (well end)	0.5 ft.

RM's 1 and 2 destroyed.

RM 3: Steel plug in a concrete post 35 ft. shoreward and 56 ft. downstream from center of gage well. Elevation, 16.91 ft. gage datum. (Origin for levels July 27, 2022).

RM 4: Steel plug in a concrete post 66 ft. shoreward from center of gage well. Elevation, 17.455 ft., gage datum. (Levels July 27, 2022).

RM 5: Brass tablet in concrete post 3 ft. shoreward and 1 ft. upstream from centerline of gage well. Elevation, 15.60 ft., gage datum. (Levels July 27, 2022).

RM 6: Chiseled "X" in the center of the downstream concrete cableway anchor on the right bank. Elevation, 18.78 ft., gage datum. (Levels July 27, 2022).

RM 7: NDNR aluminum cap 3.3 ft. north from bottom of west step rail of the gage house. Elevation, 15.05 ft., gage datum. (Levels July 27, 2022) This RM has been tampered with and the aluminum cap is missing.

Inside R.P.: An adjustable R.P. located on the front of the instrument shelf. Elevation, 24.50 ft. gage datum. An inverted graduated weighted steel tape (length = 24.50 ft.) is used to read water surface elevations directly. (Levels July 27, 2022).

Staff Gage: Two sections of enameled staff gage attached to a 2" X 6" pressure treated plank, located at the intakes. Elevation, of upper staff plate 6.74 ft. gage datum. (Levels July 27, 2022).

Hydrology

Drainage Area

880 mi², approximately, of which about 640 mi² contribute directly to surface runoff.

Channel and Control

Channel is fairly straight for about 150 ft. above and 400 ft. below gage. The right bank is steep and high while the left bank slopes up rather gently to high ground. Flow is confined to one channel at all stages. The right bank is quite heavily wooded and the left bank thinly wooded in the vicinity of the gage. The low areas are overgrown with small willows.

A reinforced concrete artificial control is about 15 ft. below the gage. It consists of a flat slab 8 ft. wide and 90 ft. long. A cut measuring 1.5' X 8' X 0.5' is located at the midpoint of the weir. Cut-off walls of 6 feet steel sheet piling were driven near the upstream and downstream edges of the control. This area was then rip-rapped and grouted with concrete as was the 20 feet below the downstream edge of the control. During periods of low flow [when inflow is being impounded in Harry Strunk Lake and when no releases are being made] the cut in the weir allows for a more consistent flow than the previous control. At times limbs, reeds and leaves accumulate on the control, causing backwater at the gage intakes.

Discharge Measurements

Low and medium flow measurements are made by wading 80 to 200 ft. below the control. In the past high water measurements are made from the cableway 100 ft. above the gage. The gaging car is located on the right bank post support. Landing platforms are provided on both banks. Clear span of the cableway is 381.8 ft. **On July 9, 2012 the cableway was condemned until repairs are made to the main cable span.**

Floods

Flood of about 120,000 cfs occurred on June 22, 1947 (by slope-area measurement at Cambridge). A discharge of about 35,000 cfs occurred on June 21, 1948. Maximum discharge during period of record, 1,300 cfs, occurred Mar. 23, 1960, at a stage of 5.97 ft. gage datum.

Extremes for Period of Record

Peak discharge 1,300 cubic feet per second March 23, 1960, gage height 5.97 ft. No flow September 11, 1990.

Point of Zero Flow

Low point on control is 1.365 ft. gage datum, by levels on 05/04/2017.

Winter Flow

Stage-discharge relation will not be affected by ice.

Regulation and Diversions

Flow regulated by storage in Harry Strunk Lake since Aug. 8, 1949

Accuracy

Stage-discharge relationship should be stable. Records of stage are good and measuring conditions are good.

Establishment and History

Established Jan. 19, 1950 by U.S. Geological Survey. Datum of gage was 2295.26 ft. National Geodetic Vertical Datum of 1929.

Original gage was an enameled staff gage section reading from 0.00 to 3.34 ft., attached to a 2" X 6" plank driven into the stream bed near the right bank 200 ft. below the gate control house. On June 2, 1950, this gage was removed and attached near the downstream end of left concrete wall of outlet chute below gate control house.

Present gage was completed on April 24, 1950 and was equipped with a Stevens A-35 graphic water-stage recorder. On April 15, 1964 a digital recorder was installed.

Work on reinforced concrete artificial control was started on June 14, 1950, and was completed on August 4, 1950. The control structure became undermined on August 4, 1951, allowing most of the flow to pass underneath the apron. In the fall of 1951 several attempts to repair the control failed. Extensive repairs to the control were made by the Bureau of Reclamation and the Geological Survey during the fall of 1952. Installation of measuring cableway was completed on January 11, 1952.

On Sept. 30, 1994 the U.S.G.S. discontinued their role in the operation of this station. On Oct. 1, 1994 the State of Nebraska Dept. of Water Resources took over the operation of this station. The digital recorder was removed on Oct. 7, 1994 and returned to the U.S.G.S.

On October 3, 2003 a new SatLink DCP was installed and connected to the A-35 recorder.

A new concrete weir was constructed during the period of Oct. 22-25, 2004. The new weir measures 90'x 8'. A cut located at the midpoint of the weir and measuring 1.5'x 8' x 0.5' allows for flow during periods of low flow.

Revision History

Original description prepared by G.L. Whitaker 06-09-1953

Revised by: M.M. Gilbert 05-16-1967

Revised by: M.M. Gilbert 06-06-1977

Revised by: B.D. Edgerton 11-03-1987

Revised by: B.D. Edgerton 05-10-1995

Revised by: B.D. Edgerton 02-12-1998

Revised by: D. Gunderson 02-14-2003

Revised by: D. Gunderson 10-07-2004

Revised by: D. Gunderson 02-17-2009

Revised by: D. Gunderson 12-20-2012

Revised by: D. Gunderson 12-09-2015

Revised by: D. Gunderson 12-17-2016

Revised by: D. Gunderson 12/19/2017

Revised by: D. Gunderson 11/21/2022