

## Elkhorn River near Tilden, Nebraska 06798780

### LOCATION

#### *Latitude and Longitude*

42.05593, -97.79539

#### *Road Log*

On the left stream bank, just left and downstream of the Elkhorn River Bridge one mile north of Highway 275 and County Road 536 Avenue intersection.

#### *Nearby Features*

### Equipment Details

#### *Recording Gage*

The current recorder is a Sutron SL3 with an OTT Radar unit as of May 1<sup>st</sup>, 2023.

#### *External Gage*

External gage is a wire weight gage mounted on the downstream rail of the bridge at Bridge Station 203. Elevation of the check bar was set to 24.11' from levels on May 12<sup>th</sup>, 2022. As of February 23<sup>rd</sup>, 2021, due to a gage datum change (+1.00'), the wire weight check-bar is 25.11' stage.

#### *Bench Mark and Reference Marks*

NOTE: A gage datum change was enacted on February 23<sup>rd</sup>, 2021 of +1.00' stage. This change is applied to all reference marks as well.

BM is brass tablet downstream on the right end of the rail. Elevation by levels is 25.57' on May 12<sup>th</sup>, 2022.

RM #1 is the top wing wall at the downstream left end. Elevation is 22.96' from levels May 12<sup>th</sup>, 2022.

RM #2 is the last I beam to north upstream guardrail. Elevation is 24.69' from levels May 12<sup>th</sup>, 2022.

RM #3 is chiseled + on top of last "I" beam to north, downstream guard rail, Elevation is 24.81' from levels May 12<sup>th</sup>, 2022.

RM #4 is a box chiseled in wing wall at upstream left end. Elevation is 22.88' from levels May 12<sup>th</sup>, 2022.

RM #5 is the east shelter leg. Elevation is 22.36' from levels May 12<sup>th</sup>, 2022.

RM #6 is a chiseled box in the concrete located 2' SW of RM #1. Elevation 22.99' levels May 12<sup>th</sup>, 2022. This RM #6 was surveyed in by DNR survey crew at MSL NGVD88 at elevation 1642.04' on April 1, 2014.

WWCB Elevation is 25.11' from levels May 12<sup>th</sup>, 2022.

RP #1 is a chiseled arrow on downstream handrail at Station 67 (about 1' south of wire weight) Elevation is 25.97' (Levels May 12<sup>th</sup>, 2022.).

RP #2 is a chiseled arrow on the downstream handrail of bridge at center point of channel at Station 155. Elevation 26.32' (Levels May 12<sup>th</sup>, 2022.).

Levels ran April 1, 2014 to establish gage datum (NAVD88).

For this site gage datum elevation is 1619.056' MSL NGVD88 from datum change on February 23<sup>rd</sup>, 2021.

## Hydrology

### Drainage Area

Estimated 2,490 square miles, about 1,490 square miles contributing to runoff.

### Channel and Control

The streambed is composed of fine and medium shifting sand, control is not well defined. Low flow control would be the channel bed. At medium stage the channel and low banks would be the control. Higher flood flows would be the flood plain.

### Discharge Measurements

Most normal low flows can be measured by wading in the vicinity of the gage. Higher flow measurements can be made from the downstream side of the bridge. Maximum safe wading stage is in the vicinity of 7.00' stage (for a 6' tall person).

### Floods

New station since 2007 so not too many floods to list and rank, but is subjective due to short period of record. So far highest one occurred on June 14, 2010 with a gage height of 16.14' and 32,200 cubic feet per second. Second highest flood occurred on March 14, 2019 with a gage height of 15.44' and 22,859 cubic feet per second.

As of 2022 from the National Weather Service, flood stages are:

Action Stage	- 13.00'
Flood Stage	- 15.00'
Moderate Flood Stage	- 16.00'
Major Flood Stage	- 18.00'

### Extremes for Period of Record

Peak discharge 32,200 cubic feet per second June 14, 2010 at gage height 16.14 feet; minimum daily discharge 41 cubic feet per second August 31 and September 1, 2012.

### *Point of Zero Flow*

Variable due to the shifting nature of the fine sand in the channel. PZF for WY2022 was 5.62'. PZF for WY2023 was 5.25'.

### *Winter Flow*

### *Regulation and Diversions*

There are no regulation structures or large surface water diversions above this gage.

### *Accuracy*

Discharge measurements will normally be made every four (4) weeks since the stream is of shifting sandy nature. Stream tends to scour significantly with any extended high flows.

## **Establishment and History**

Established by the Department of Natural Resources (DNR) on May 25, 2007. SafePurge, Design Analysis WaterLog H-350XL sensor/logger and Microcom Express Logger/GOES transmitter was installed in a metal shelter at the left bridge abutment about two miles northeast of Tilden, Nebraska. Instrumentation was installed for satellite real time retrieval of the gage height data.

On March 18, 2008 the H-350XL was removed and replaced with a Hydrologic Services-WL-3100A, pressure sensor.

On July 24, 2013, Hydrological Services WL-3100H, pressure sensor was removed and replaced with a Waterlog H-3553 Bubbler and a Waterlog H-522 Plus data recorder/transmitter.

On June 23, 2020 an OTT Radar Gun sensor was installed on the east concrete bridge rail, connected to the Waterlog H-522+ data receiver/transmitter. The Radar cable was laid on the exterior of the concrete rail into the gage house. The Waterlog H-3553 bubbler was disconnected.

On May 1, 2023 a Sutron SL3 encoder was connected to a Dome antenna and the present OTT radar unit. All Waterlog/older equipment was disconnected and removed.

## **Revision History**

Original description prepared by Ken Meikle on 03/17/2009

Revised by Wm. H. Birkel on April 12, 2010

Revised by Wm. H. Birkel on March 23, 2011

Revised by Wm. H. Birkel on July 28, 2011

Revised by Wm. H. Birkel on June 26, 2012

Revised by Wm. H. Birkel on May 8, 2013

Revised by Wm. H. Birkel on June 12, 2013

Revised by Wm. H. Birkel on January 2, 2015

Revised by Wm. H. Birkel on August 4, 2015

Revised by Wm. H. Birkel on april 11, 2016

Revised by M. Wieseler January 11, 2016

Revised by A. Houser October 10, 2019

Revised by A. Houser September 30, 2021

Revised by Wm. H. Birkel October 23, 2022

Revised by A. Houser October 3, 2023