# Elkhorn River at Winslow, Nebraska
06799510

## LOCATION

### *Latitude and Longitude*

41.61102, -96.46851

### *Road Log*

On the left stream bank just left and downstream of Elkhorn River Bridge on County Road J about 2 miles east of Winslow, Nebraska

### *Nearby Features*

Railroad crossings 1.5 mile west on the Rd J, just on the outskirts of Winslow.

## Equipment Details

### *Recording Gage*

OTT RLS Radar attached to a Sutron SL3 encoder. Equipment is installed in a 3'x 3' x 80" Arkfield metal shelter.

### *External Gage*

The reference gage is a wire weight mounted on the downstream concrete guardrail of the bridge. Elevation of the check bar is set at 32.55' on May 9, 2022.

### *Bench Mark and Reference Marks*

*There are no benchmarks (BM's) nearby this gage.*

Levels run on April 2, 2014, to establish initial reference marks (RM's), check bar elevation (WWCB) of wire weight and surface water elevation. All results are stage above gage datum. Gage datum normally considered an imaginary line of elevation about 1' below streambed that is considered 0.00' stage (start point of river stage).

The elevations of RMs and RPs as of May 9, 2022 survey as follows:
**RM #1** is chiseled "x" downstream abutment left side. Elevation 31.93'. Origin, Levels May 9, 2022.
**RM #2** is chiseled "x" upstream left abutment. Elevation 31.99', Levels May 9, 2022.
**RM #3** is chiseled "x" on southwest leg of gage house. Elevation 31.66', Levels May 9, 2022.
**RM #4** is lag bolt REA pole, 30' southeast of gage house. Elevation 31.14', Levels May 9, 2022.
**RM #5** is a chiseled cross on the southeast corner of the concrete curb of the bridge above RM #1. Elevation 32.75', Levels May 9, 2022. RM #5 established by DNR survey crew in June 2009 to establish sea level elevation at gage (NAVD88).
**RP #1** is arrow on vertical beam near east pier. Elevation 34.13', Levels May 9, 2022

**RP #2** is arrow on vertical bean 8' east of wire weight. Elevation 33.75', May 9, 2022.
**Check Bar** is check bar rod in wire weight apparatus. Elevation 32.55', Levels May 9, 2022.
Gage Datum NGVD 1988 is 1189.46' feet above MSL in accordance with April 2, 2014 survey.
In order to further explain, gage datum is an imaginary line of elevation that is the start point or river stage 0.00' usually about 1' below the bed of the stream.

## Hydrology

### *Drainage Area*

Estimated 6,120 square miles with about 5,090 square miles contributed by direct surface water runoff.

### *Channel and Control*

The streambed is composed of fine silt and medium shifting sand. Control is not well defined. Low flow control will be channel bed. At medium stage, the channel and low banks would be control. Higher flood stages, flood plain would be control. Channel is straight at bridge. At high stages, the riverbed readily scours a channel due to fast velocities.

### *Discharge Measurements*

Stages must be very low for wading measurements usually made 400-feet downstream of the bridge, or 200-feet upstream of the bridge. Most measurements are conducted from the upstream side of bridge, by bridgeboard, StreamPro (boat), or crane method. Maximum wading depth is 8.00' stage.

### *Floods*

Established in 2022 by the National Weather Service, flood stages are:

| | | |
|---|---|---|
| Action Stage | = | 14.00' |
| Flood Stage | = | 17.00' |
| Moderate Flood Stage | = | 20.00' |
| Major Flood Stage | = | 23.00' |

### *Extremes for Period of Record*

Peak discharge 76,200 cubic feet per second March 14th, 2019 gage height 24.14 feet; minimum daily discharge 104 cubic feet per second September 7, 2012.

### *Point of Zero Flow*

Variable due to the shifting nature of the fine sand in the channel. Point of Zero flow was captured 200-feet upstream from the bridge in WY2022 at +0.72' stage. Prior PZF's were captured roughly 400-feet downstream from the side of bridge. No PZF recorded for WY2023.

### *Regulation and Diversions*

Has not yet been established.

### *Accuracy*

Records are good except for periods of ice effect, which are poor.

## Establishment and History

Established by the Department of Natural Resources on July 11th, 2007. Equipment is sheltered in a 3' x 3' x 80" high Arkfield steel shelter. The equipment consisted of a Safepurge Hydrologic Services WL-3100A pressure sensor and a Microcom Express logger/GOES transmitter. All gage height data is referenced to a wire weight on downstream midpoint handrail.

As of December 16th, 2013; equipment changed to a Waterlog H-522+ recorder/transmitter using a Waterlog H-3553 bubbler attached to a river line and open-end orifice located downstream of east pier as of August 26th, 2014.

As of July 20th, 2020; the Waterlog H-3553 bubbler and open-end orifice were retired and an OTT RLS radar unit was installed. The radar unit gathers gage height data and continues to utilize the Waterlog H-522+ recorder/transmitter.

Antenna position is Latitude 41˚36'40", west Longitude -96˚28'06". Azimuth angle 50˚ from south, elevation angle 26˚ up from the horizon.

As of July 20, 2020 the Waterlog Bubbler was removed and replaced with an OTT RLS Radar.

As of May 23rd, 2023; Waterlog unit removed. A Sutron SL3 encoder and Dome antenna was installed.

## Cooperation

Lower Elkhorn Natural Resources District (LENRD) considered the cooperator of this site.

## Revision History

Original description established by Wm H. Birkel 06/10/2009
Revised by Guy Lindeman and Wm. H. Birkel 09/15/2009
Revised by Wm. H. Birkel 07/23/2010
Revised by Wm. H. Birkel 03/28/2010
Revised by Wm. H. Birkel 05/31/2012
Revised by Wm. H. Birkel 12/04/2013
Revised by Wm. H. Birkel 02/16/2015
Revised by Wm. H. Birkel 12/02/2015
Revised by Wm. H. Birkel 06/14/2016
Revised by Wm. H. Birkel 01/25/2017
Revised by Grant Beckman 11/29/2018
Revised by Jeff Vifquain 10/21/2019
Revised by J. Hladik 03/18/2021

Revised by A. Houser 11/14/2022
Revised by A. Houser 10/05/2023