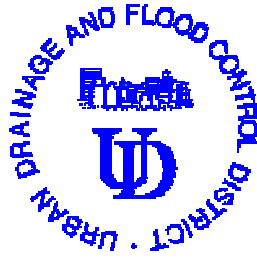


Urban Drainage and Flood Control District



E-19 Survey



Orodell Gage
ALERT ID: 4403
LID: ODBC2

HDR Engineering, Inc.
303 E 17th Ave. Suite 300
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Introduction

HDR Engineering Inc. was contracted by the Urban Drainage and Flood Control District to survey various flood warning stage gages to provide information about these site in a manner consistent with National Weather Service E-19 procedures. On October 12, 1999, five sites were surveyed by HDR personnel in the Boulder Creek and South Boulder Creek basins. This report is a summary of the work done and information gathered for the Orodell gage. Included in this report are elevations of critical points in the vicinity of the site, estimates of stages causing flood damage in vicinity of the gage, and where available past history of the sites including historic high water marks and other critical flood information.

Site

The stream gage is located on Boulder Creek just upstream of Orodell along Highway 119 near mile marker 38, just downstream of the Boulder hydroelectric plant. The ALERT ID number for this Gage is 4403 while the National Weather Service LID is ODBC2 and is referred to as Orodell. The Gage and has been a USGS Gage since 1887 and recently added an ALERT transmitter to the site for inclusion into the District's ALERT system. There is one large structure just to the northwest of the Gage along with an access road and a few small picnic tables. Potential flooding at this gage site itself would be minor consisting of over topping the bikepaths along the stream and possible inundation of Highway 119 at very high stages. The primary area of flooding potential is in the City of Boulder approximately three miles downstream. Figure 1 shows a general location map of the site.

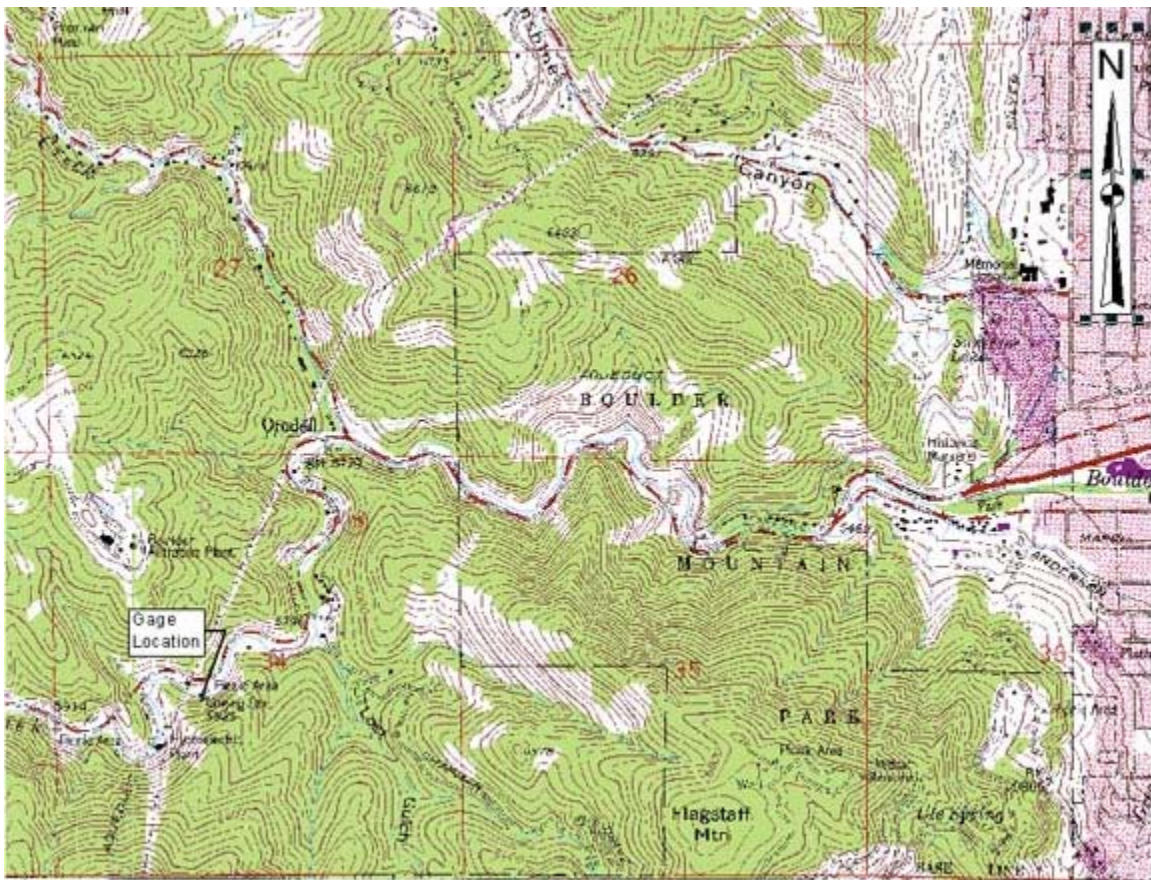


Figure – 1 Location Map

Surveyed locations

The ground elevations along the left overbank were surveyed for a potential cross-section in conjunction with previous rating studies of the gage. In addition the foundation corners of the large building to the northwest of the gage were surveyed, along with water surface elevations of the stream upstream and downstream to estimate the channel slope and this reach. Figure 2 shows locations of the surveyed points in the vicinity of the gage. The floor of the gage house was surveyed to be at stage 7.83. It is estimated that the instruments will be flooded and transmission will be lost at approximately stage 10. The structure to the northwest of the gage had its foundation surveyed at approximately stage 17.2. Road over topping does not occur on Highway 119 until approximately stage 22. Based on several spot elevations of the water surface, the estimated channel energy slope is 1.5 percent.

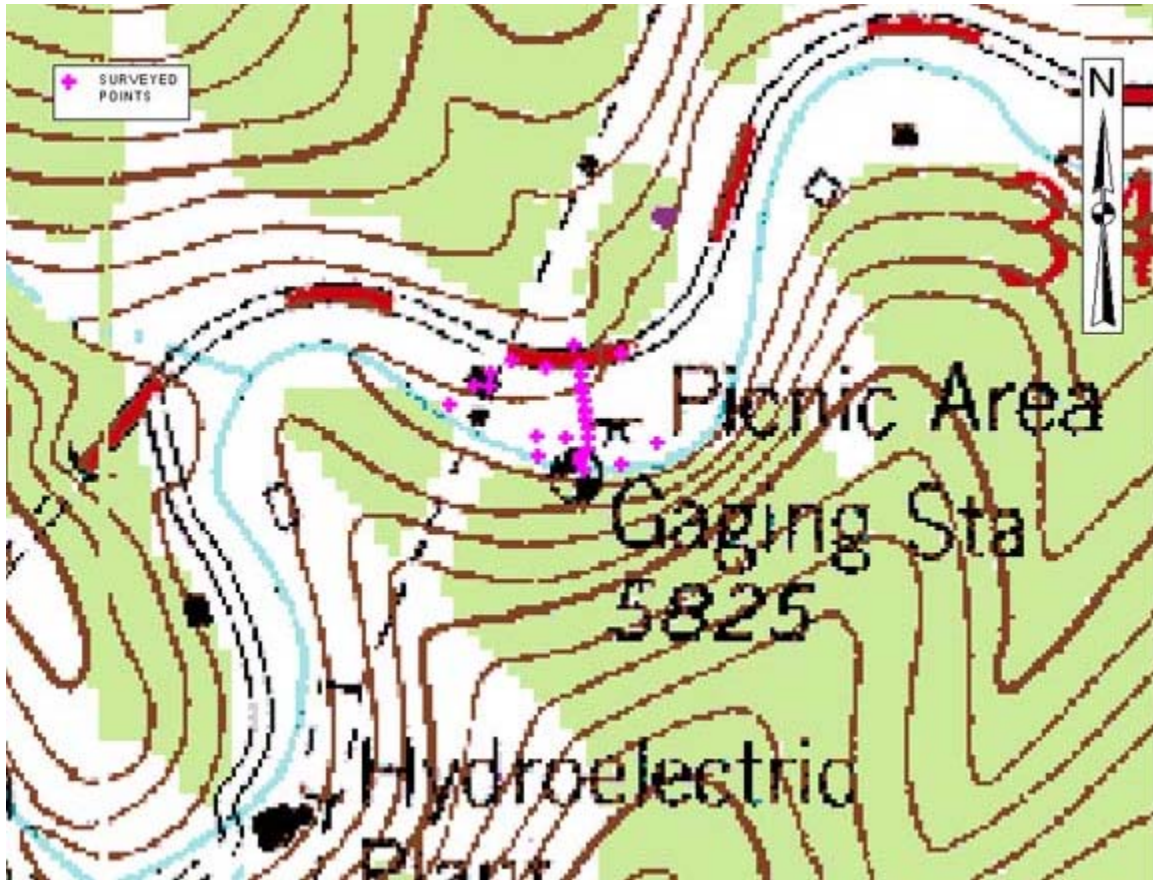


Figure – 2 Surveyed Points

Site photographs

Several digital photographs were taken of the site and several panorama views were created based on the site photographs. Figure 3 shows Boulder Creek at the gage location looking downstream. Figure 4 shows Boulder Creek at the gage location looking upstream. Figure 5 shows and the left overbank including Highway 119 where the ground elevations were surveyed. Figure 6 shows the gage house where the stilling well and transmitters are located.



Figure – 3 Looking Downstream



Figure – 4 Looking Upstream



Figure – 5 Left Overbank



Figure – 6 Gage House

Historic records

Based on information supplied by the National Weather Service, several high water elevations have occurred at this gage. The following table lists the stage, date, time, and the estimated flow at this gage for various storms during the period of record.

STAGE	DATE	TIME	Q
4.60	8/3/19	18:00	1300
4.30	6/6/21	18:00	2500
4.07	5/7/69	18:00	1220
4.01	7/24/65	18:00	1190
4.00	6/21/47	18:00	1290
3.96	6/7/52	18:00	1180
3.93	6/21/51	18:00	1220
3.87	6/29/57	18:00	1010
3.86	6/21/41	18:00	1120
3.62	6/15/35	18:00	1060

Flood warning template

The graphics template was created based on the surveyed information, historic records, another information supplied by the Urban Drainage and Flood Control District and the National Weather Service. The graphics template is compatible with the flood warning system and has been created and installed on the District's WebServer. This template is named 4403web.tpt and is located in the appropriate directory in the District's WebServer. Figure 7 shows the graphics template online from the WebServer.

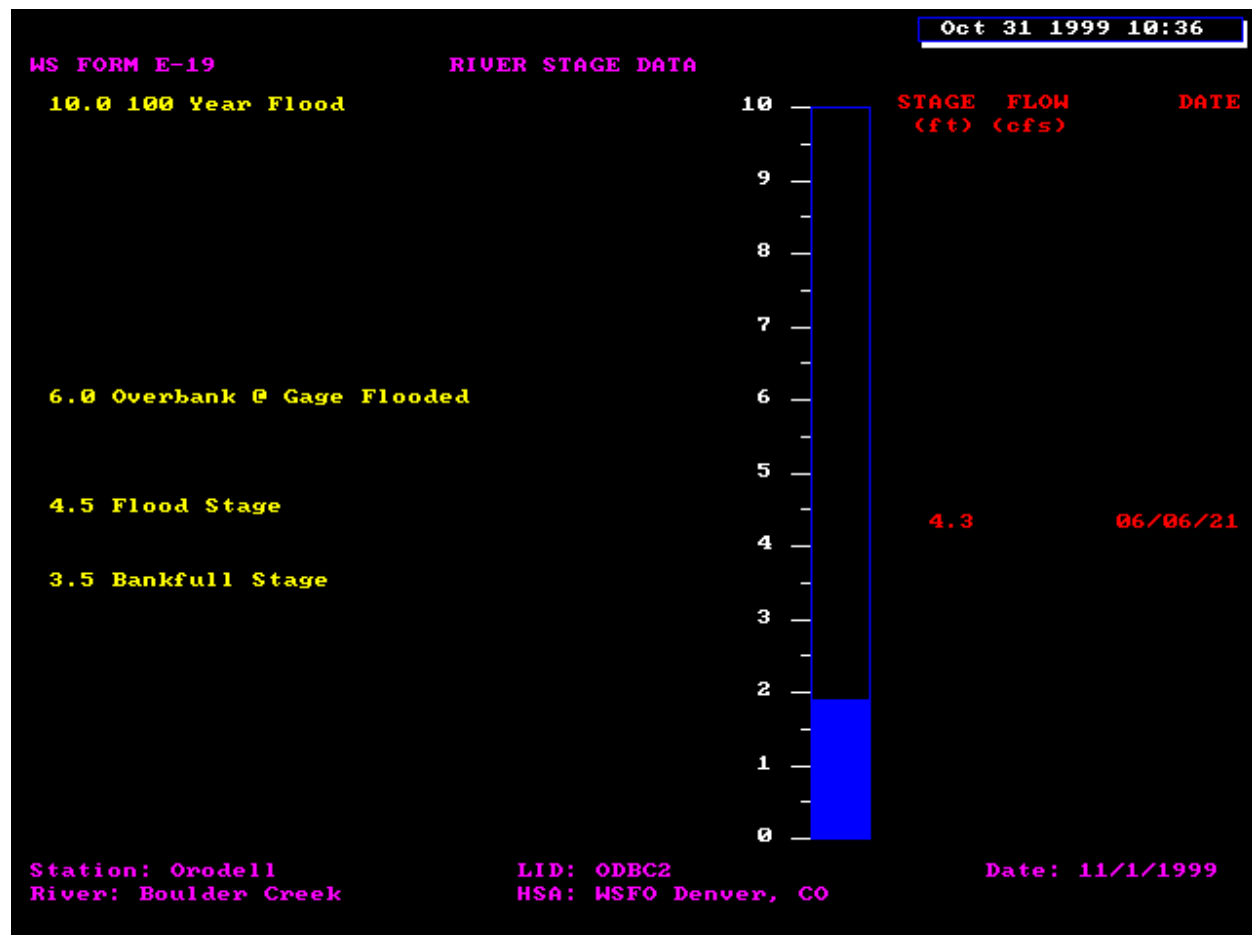


Figure – 7 Graphic Templet