

WASHINGTON DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
FRESHWATER MONITORING UNIT
STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 30C070
STATION NAME: Little Klickitat River near Wahkiacus
WATER YEAR: WY2010
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Introduction

Watershed Description

The Little Klickitat River flows in south central Washington from the Simcoe Mountains and Horse Heaven Hills west across the Munson Prairie and through the Little Klickitat canyon to its confluence with the Klickitat River. The watershed drains approximately 280 square miles and includes range, agricultural, and forest lands. The river has been designated as Class A and is used primarily for irrigation, stock watering, and aquatic life habitat. Elevation ranges from about 590 ft at the gage up to 5820 ft along the ridges at the northeast basin boundary. About 14% of the basin is covered by forest canopy. Annual precipitation averages 24.5 inches per year.

Gage Location

The gage is 15 miles west of Goldendale on the south side of State Highway 142. The gage is on the right bank 400 feet upstream from the Hwy 142 Bridge and 1/4 mile upstream from the confluence with the Klickitat River. The Primary Gage Index is a sloping staff gage on the right bank near the gage house and slant pipe.

Table 1.

Drainage Area (square miles)	280
Latitude (degrees, minutes, seconds)	45, 50, 32 North
Longitude (degrees, minutes, seconds)	121, 03, 29 West

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	120
Median Annual Discharge (cfs)	114
Maximum Daily Mean Discharge (cfs)	557
Minimum Daily Mean Discharge (cfs)	20
Maximum Instantaneous Discharge (cfs)	658
Minimum Instantaneous Discharge (cfs)	19
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	250
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	28
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	24

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

The 24 days in which discharge was below the range of ratings occurred during a period of a phased shift from Table 501 back to Table 305. Actual discharge for those days would be lower than the values indicated. The difference between the indicated discharge for those days and the actual discharge is not known.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	2%
Weighted Rating Error (% of discharge)	12%
Total Potential Error (% of discharge)	14%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	303	403	304
Period of Ratings	10/1 to 10/12/2009	10/1 to 11/22/2009	11/7 to 1/6/2010
Range of Ratings (cfs)	1.0 to 2110	12.1 to 2110	1.0 to 2110
No. of Defining Measurements	36	32	36
Rating Error (%)			

Rating Table No.	501	305	404
Period of Ratings	12/7/09 to 1/18/10	1/6 to 9/30/2010	8/4 to 9/30/2010
Range of Ratings (cfs)	122 to 2110	1.0 to 2110	12.1 to 2110
No. of Defining Measurements	4	36	32
Rating Error (%)			

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Narrative

Several phased rating shifts between clones of Rating 3 and Rating 4 occur during the year largely in response to changes in leaf litter and small woody debris accumulation during low flow periods. An unexplained fill event following a period of channel icing is responsible for a period of influence by rating 501 in December and January.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	3.22
Maximum Recorded Stage (feet)	5.90
Range of Recorded Stage (feet)	2.68
Number of Un-Reported Days	9
Number of Days Qualified as Estimates	27
Number of Days Qualified as Unreliable Estimates	0

Narrative

Ice impacts to water levels from December 7 through December 15 were responsible for the nine unreported days in the stage record. The 27 days qualified as estimates occurred as follows: One day was qualified as an estimate due to uncertainty about possible ice effect. The slope-conveyance model was used to estimate high flows on two days. There were 24 days in which Rating 501 was in partial effect while the stage was below its range of rating.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	Slope Conveyance
Range of Modeled Stage (feet)	6.00 to 8.80 ft.
Range of Modeled Discharge (cfs)	693 to 2110 cfs
Valid Period for Model	10/1/2006 to 9/30/20
Model Confidence	4%

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
Station, cross section and longitudinal.	9/21/2010

Activities Completed

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