

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

STATION ID: 31B070
STATION NAME: Rock Creek at Old Hwy 8 Bridge
WATER YEAR: 2012
AUTHOR: Don Watt

Introduction

Watershed Description

The Rock Creek basin in south central Washington lies between the Bickleton Ridge in the north and the Goodnoe Hills in the south. The creek drains into Lake Umatilla on the Columbia River about three miles downstream from the gage. The basin above the gage drains approximately 217 square miles and includes range and agricultural lands with limited forest areas at higher elevations in the north. Elevation ranges from about 420 feet at the gage to 4730 feet along the ridge at the northern basin boundary. About five percent of the basin is covered by forest canopy. Annual precipitation averages 18 inches per year. Surface water generally flows in Rock Creek from November until July. A deep pool remains at the gage site year around.

Gage Location

The gage is about 18 miles southeast of Goldendale at the west end of the Old Highway 8 bridge, near river mile 3. The gage is on the right bank and measures water level in a deep year-round pool in the channel under the bridge. The Primary Gage Index is a staff gage mounted on the bridge abutment at the right bank near the gage house and slant pipe.

Table 1.

Drainage Area (square miles)	217
Latitude (degrees, minutes, seconds)	45 44 52
Longitude (degrees, minutes, seconds)	120 26 11

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	44 cfs
Median Annual Discharge (cfs)	7 cfs
Maximum Daily Mean Discharge (cfs)	434 cfs
Minimum Daily Mean Discharge (cfs)	0 cfs
Maximum Instantaneous Discharge (cfs)	628 cfs
Minimum Instantaneous Discharge (cfs)	0 cfs
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	144 cfs
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	0 cfs
Number of Days Discharge is Greater Than Range of Ratings	6 days
Number of Days Discharge is Less Than Range of Ratings	21 days

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

Narrative

It is estimated that flow resumed on 11/3/2011, and ceased on 7/28/2012.

Flow was occurring on 21 days in July in which discharge was less than the range of ratings. However, flow throughout that period was less than 0.9 cfs as the water level approached the estimated point of zero flow (PZF).

There was no surface flow from the end of July 2012 through the end of the water year.

There were 64 days with the measured water level below the PZF. Another 34 days were assumed to have been below the PZF after removal of the continuous gage in August 2012. The total of 98 days with zero flow skews the Median Annual Discharge downward to a value much lower than the Mean Discharge for the year.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	2%
Weighted Rating Error (% of discharge)	13%
Total Potential Error (% of discharge)	15%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	5	6	
Period of Ratings	10/1/2011-3/30/2012	3/30/2012 - 8/28/2012	
Range of Ratings (cfs)	0.00 to 664 cfs	0.9 to 664 cfs	
No. of Defining Measurements	7	7	
Rating Error (%)	13%	13%	

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

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

Narrative

--

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	3.94
Maximum Recorded Stage (feet)	13.12
Range of Recorded Stage (feet)	9.18
Number of Un-Reported Days	40
Number of Days Qualified as Estimates	23
Number of Days Qualified as Unreliable Estimates	None

Narrative

Of the 40 unreported days, 34 occurred in August and September 2012 when the water level was well below the point of zero flow. There were six unreported days with instantaneous flows greater than twice the highest measured flow.

The 23 days qualified as estimates include the 21 days described above as having discharge less than the range of ratings.

Linear interpolation was used to estimate water levels on four days that were near or below the point of zero flow.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	None
Range of Modeled Stage (feet)	N/A
Range of Modeled Discharge (cfs)	N/A
Valid Period for Model	N/A
Model Confidence	N/A

Surveys

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

Type	Date

Activities Completed

Station was decommissioned and continuous gaging equipment removed on 8/27/2012, about one month after the water level fell below the point of zero flow.