

**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:** 2011  
**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)	61 cfs
Median Annual Discharge (cfs)	13 cfs
Maximum Daily Mean Discharge (cfs)	456 cfs
Minimum Daily Mean Discharge (cfs)	0 cfs
Maximum Instantaneous Discharge (cfs)	651 cfs
Minimum Instantaneous Discharge (cfs)	0 cfs
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	182 cfs
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	0 cfs
Number of Days Discharge is Greater Than Range of Ratings	12 days
Number of Days Discharge is Less Than Range of Ratings	34 days

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

**Narrative**

Flow is estimated to have started on 10/28/2010, and ceased on 8/9/2011. There were 85 days that had mean discharge of zero cfs with the water level near or below the point of zero flow. The time-weighted flow analysis found zero discharge during 22 percent of the year. The large number of days with zero flow skews the Median Annual Discharge downward to a value much lower than the Mean Annual Discharge. The 34 days with instantaneous discharge values below the range of ratings were estimated to have mean discharge between 20 cfs and 50 cfs.

**Error Analysis**

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	2 %
Weighted Rating Error (% of discharge)	15 %
Total Potential Error (% of discharge)	17 %

**Rating Table(s)**

Table 4. Rating Table Summary

Rating Table No.	3	4	5
Period of Ratings	10/1/2010 - 1/29/2011	12/21/2010 - 6/4/2011	4/25/2011 - 9/30/2011
Range of Ratings (cfs)	0.00 to 610	47 to 664	0.00 to 664
No. of Defining Measurements	12	3	7
Rating Error (%)	16 %	16 %	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

A series of high flow events in December 2010 and January 2011 started a pattern of ongoing channel filling that continued throughout water year 2011. Tables 3, 4, and 5 reflect stages in the fill process.

## Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	3.94
Maximum Recorded Stage (feet)	11.02
Range of Recorded Stage (feet)	7.08
Number of Un-Reported Days	12 days.
Number of Days Qualified as Estimates	34 days
Number of Days Qualified as Unreliable Estimates	None

## Narrative

The 12 unreported days had instantaneous discharge values greater than twice the highest measured flow for the rating period. The 34 days qualified as estimates had water levels above the point of zero flow but less than half of the applicable lowest measured 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
None	N/A

## Activities Completed

--