

# **COLUMBUS CREEK**

**FIVE MILE DITCH DIVERSION**

# **COLUMBUS CREEK DRAINAGE INTRODUCTION**

## **BACKGROUND**

Columbus Creek flows out of the east slope of the Bighorn Mountains, between Piney Creek drainage to the south and the East Fork of the Big Goose to the north. Its flows consist primarily of snow pack melt generated in the eastern side of the Bighorn Mountains and as a result, tend to increase to 20-30 cfs in May and June, then decrease to 4-5 cfs by September. Columbus joins the Tongue River just upstream of Ranchester, Wyoming. The Tongue leaves Wyoming north of Acme, Wyoming, to fill the Tongue River Reservoir in Montana.

## **CHARACTERISTICS**

Columbus Creek works its way through cobble and gravel bars from old river channels, driving up the instream losses. Its passage near shallow subdivision wells probably also increase its losses.

## **USAGE**

Columbus Creek's diversions are devoted almost entirely to agricultural irrigation.

### **Regulation**

Columbus Creek typically does not go into regulation. Return flows are enough to replenish creek flow to satisfy downstream demand even though the creek is entirely diverted at Five Mile Ditch.

### **Agriculture**

See irrigation and crop planting practices in the memorandum below.

The typical irrigation season runs from April 15-May 1 (depending on whether the spring runoff is delayed by colder weather) to mid/early October (depending on when the first snows fall and the ground freezes). All of the irrigators using Columbus Creek water practice post-season irrigation, using their full rights to do so.

### **Double Appropriation**

Irrigation water rights with priority dates of March 1, 1945 or earlier are entitled to an additional 1cfs per 70 acres under Wyoming's surplus water statutes. Whenever the supply in a stream exceeds the amount required to satisfy all existing appropriations established prior to March 1, 1985, the stream is said to be in an excess flow condition and water right holders with priorities between March 2, 1945 and March 1, 1985 may use an additional 1 cfs for each 70 acres irrigated.

In Columbus Creek, this practice is limited by the flow in Columbus Creek (less than 30 cfs in the past few years) and the condition of the ditches, none of which is estimated to carry double appropriation.

### **Permitted Uses**

Permits granted for water appropriation are granted for specific uses. The following pages contain tables of permits and their associated uses. The following table provides a key to those uses:



Unit	Flow or volume	CFS = cubic feet per second AF = acre-feet GPM = gallons per minute
SupTyp	Supply Type	OS = original supply SS = supplement supply, for lands having an original supply from another source Sec = secondary supply, for water stored in a reservoir
Status	Status of adjudication	Adj = adjudicated Una = unadjudicated
Source	Source water	Parentheses denote the permit number of the related storage right.

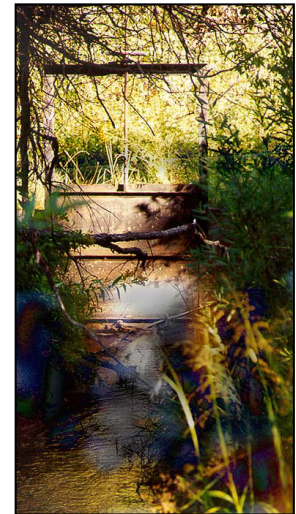
## KEY DIVERSIONS

**Diversion:** FIVE MILE DITCH DIVERSION

**Date:** 9/12/2000

**Note:** The Five Mile Ditch diverts all the flows of Columbus Creek. Thus, the recorded ditch data from the Five Mile recorder doubles as the Columbus Creek recorder.

**Diversion Description:** Headgate consists of a single 4.0 x 4.0-foot square wood-and-steel gate in steel slides operated with a Waterman-type screw, mounted in a steel throat. The area surrounding the headgate can be marshy and is significantly overgrown.



Five-Mile Ditch headgate

**Diversion Location:** The Five Mile Ditch diversion is located on the main stem of Columbus Creek.

Headgate:

Lat. Long.  
N 44° 55' 1.2" W 107° 22' 15.4"



Five-Mile Ditch stream gage/recorder

Stream gage/recorder:

Lat. Long.  
N 44° 55' 1.4" W 107° 22' 14.1"

**Conveyance Description:** Open channel canal, approx. 8.5 mi. long. The conveyance includes a number of flumes and includes Wagner and Five Mile reservoir in its flow path.

**Direct Flow Water Rights:** The summary for direct flow rights follows:

Permit	Priority Date	Permitted Use	Acres	Flow (cfs)	Cumulative (cfs)
Terr.	08-16-1882	D,I,S	7.0	0.20	0.20
Terr.	08-16-1882	D,I,S	7.0	0.20	0.40
Terr.	08-16-1882	I	10.0	0.25	0.65
Terr.	08-16-1882	D,I,S	16.0	0.34	0.99
Terr.	08-16-1882	I	40.0	0.67	1.66
Terr.	08-16-1882	D,I,S	60.0	0.96	2.62
Terr.	08-16-1882	D,I,S	70.0	1.10	3.72
Terr.	08-16-1882	D,I,S	70.0	1.10	4.82
Terr.	08-16-1882	D,I,S	85.0	1.31	6.31
Terr. (Sec)	08-16-1882	D,I,S	90.0	1.38	7.51
Terr.	08-16-1882	D,I,S	90.0	1.38	8.89
Terr.	08-16-1882	D,I,S	100.0	1.53	10.42
Terr.	08-16-1882	D,I	120.0	1.81	12.23
Terr.	08-16-1882	D,I,S	160.0	2.39	14.62
Terr.	08-16-1882	D,I,S	300.0	4.38	19.00
Terr.	08-16-1882	D,I,S	385.0	5.60	24.60
Terr.	06-00-1886	I	6	0.19	24.79
Terr.	12-31-1890	D,I,S	10.0	0.24	25.03
Terr.	12-31-1890	I	10.0	0.24	25.27

Direct flow rights cont'd:

Permit	Priority Date	Permitted Use	Acres	Flow (cfs)	Cumulative (cfs)
Terr.	12-31-1890	D,I,S	160.0	2.39	27.66
1521E	08-26-1903	I	50.0	0.71	28.37
4423E	11-12-1924	I	437.1	6.24	34.61

*Note: "Sec" denotes secondary supply, or water stored in a reservoir.*

**Associated Storage Rights:** Rights associated with Wagner and Five Mile reservoirs.

**Irrigation Practices:** Approx. 50 percent pivot and siderolls, 50 percent ditch-flood. Irrigators tend to plant approx. 35 percent corn, 40 percent alfalfa, and 25 percent hay.

**Return Flows:** Return flows were not known.

**Losses:** 20 percent by the end of the ditch

**References:** Bill Knapp, water commissioner, State Engineer's Office, interview, 9 Feb. 2001

Pat Boyd, water commissioner, State Engineer's Office, interview, 12 Sept. 2000

***Irrigated Lands Water Rights Database***

PerNo	PerSfx	Facility Name	Priority	Acres	Amount	Unit	SupTyp	Status	Source
Terr	D	Wyoming & Five Mile	Aug. 16, 1882	1730	26.41	CFS	OS	Adj	Columbus Creek
Terr	D	Wyoming & Five Mile 2nd App	Dec. 31, 1890	180	2.87	CFS	OS	Adj	Columbus Creek
5441	D	Wagner (Enl. Wyoming & Five Mile)	April 29, 1903	32	0.45	CFS	Sec	Adj	Columbus Creek (397R)
4423	E	Enl. Wyoming & Five Mile	Nov. 12, 1924	437.1	6.24	CFS	OS	Adj	Columbus Creek

Name Source District Data													
Five Mile Ditch Diversion Colombus Creek 5 Total monthly flow in AF													
Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1970													
1971													
1972													
1973													
1974							0.00	0.00	0.00	0.00	341.43	0.00	341.43
1975													
1976													
1977													
1978													
1979													
1980													
1981							0.00	287.92	309.72	393.42	215.56	0.00	1206.62
1982													
1983													
1984													
1985													
1986													
1987													
1988													
1989							0.00	584.82	429.37	275.81	263.31	226.24	1779.55
1990							508.50	786.10	888.90	394.70	287.00	241.80	3107.00
1991							439.20	1087.60	887.10	446.30	303.50	288.30	3452.00
1992							358.90	673.70	609.00	695.50	381.90	291.70	3010.70
1993							329.50	1299.80	1127.00	765.30	466.10	349.80	4337.50
1994							817.20	1058.50	625.80	376.40	290.50	292.00	3460.40
1995							308.80	638.90	1360.20	782.00	400.90	316.40	3807.20
1996							417.50	1147.20	904.40	507.60	291.20	219.90	3487.80
1997							0.00	913.00	1118.20	535.90	386.90	280.30	3234.30
1998							0.00	1002.50	842.50	442.40	355.70	281.50	2924.60
1999							0.00	952.00	1018.00	514.00	323.00	267.00	3074.00
Mean							244.58	802.46	778.48	471.49	331.31	235.00	2863.32
Max							817.20	1299.80	1360.20	782.00	466.10	349.80	4337.50
Min							0.00	0.00	0.00	0.00	215.56	0.00	341.43

- Notes:
1. Monthly data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980
  2. Zero flow is assumed prior to the first and after the last measurement
  3. Monthly data for 1981 is derived from spot measurements in the Hydrographers' Annual Reports.

Name	Five Mile Ditch Diversion		
Source	Columbus Creek		
District	5		
Data	First & Last Dates, Max. Days		
Water Year	First Date of Measurement	Last Date of Measurement	Maximum Days Missing
1970			
1971			
1972			
1973			
1974	1-Aug	31-Aug	0
1975			
1976			
1977			
1978			
1979			
1980			
1981	4-May	19-Aug	33
1982			
1983			
1984			
1985			
1986			
1987			
1988			
1989	11-May	26-Sep	0
1990	3-Apr	30-Sep	0
1991	1-Apr	30-Sep	0
1992	1-Apr	30-Sep	0
1993	7-Apr	30-Sep	0
1994	1-Apr	30-Sep	0
1995	1-Apr	30-Sep	0
1996	17-Apr	30-Sep	0
1997	7-May	30-Sep	0
1998	1-May	30-Sep	0
1999	6-May	30-Sep	0
Avg.	25-Apr	24-Sep	3
Earliest	1-Apr	19-Aug	0
Latest	1-Aug	30-Sep	33

Notes: 1. Data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980.