



## Little Belt Creek Water Lease 2019

The 10-year water right lease agreement on Little Belt Creek was given final approval by the Fish & Wildlife Commission in February 2018. The lease agreement calls for the lessor to divert no more than 1 cubic foot per second (cfs) compared to the right's maximum diversion rate of 25 cfs. Further, when streamflow drops below 2.1 cfs, the lessor must reduce irrigation diversion until such time streamflow meets or exceeds 2.1 cfs, even if that means ceasing to irrigate. An application to temporarily change the water rights to instream flow was submitted to DNRC in August 2018. The Change Authorization was approved by DNRC in April 2019.

After high water began to recede in the spring of 2019, a stilling well, staff gage and water level logger were installed at the measurement point authorized by DNRC. The following figures show the gage location, staff gage attached to the stilling well and the control section on Little Belt Creek downstream of the gage.



Fig.1. Stream gage location on Little Belt Creek.

Eight streamflow measurements were taken through the summer and fall beginning on June 5<sup>th</sup> and ending on November 8<sup>th</sup>, when measurement ended for the year. The measurements were used to develop a water level-discharge relationship for Little Belt Creek at the gage site. The water level logger recorded the water level every 30 minutes. The water level-discharge relationship was used to calculate the streamflow every 30 minutes. The average daily streamflow is shown in Fig. 4 in comparison to the streamflow target of 2.1 cfs. A table of daily average streamflow at the gage site is attached as is a rating table that has been provided to the owner of the water rights. The table will be adjusted as additional measurements are taken in the future.

Streamflow dropped slightly below 2.1 cfs lease target near the end of August. At that time no irrigation was occurring. With fall precipitation streamflow rebounded above the 2.1 cfs lease target.



Fig.2. Staff gage attached to stilling well.

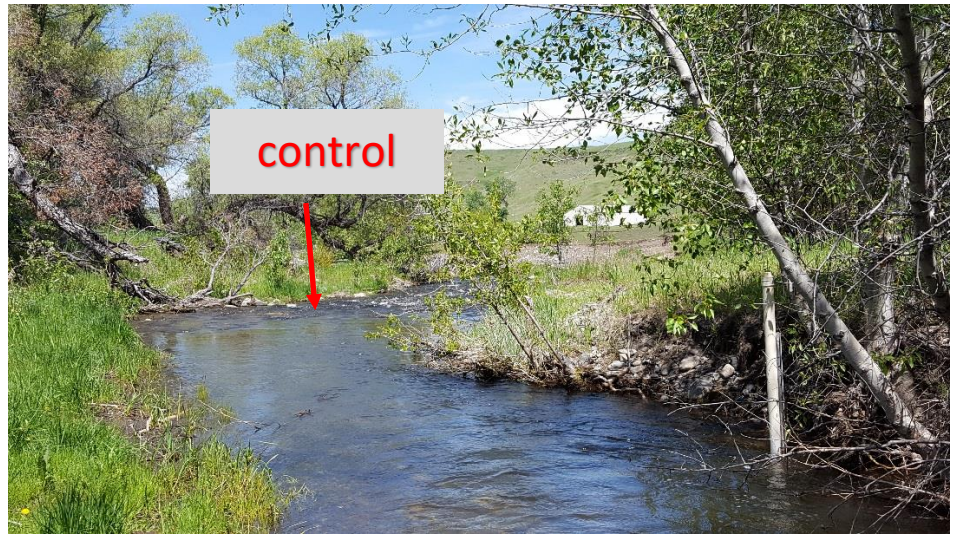


Fig.3. Control section on stream below gage.

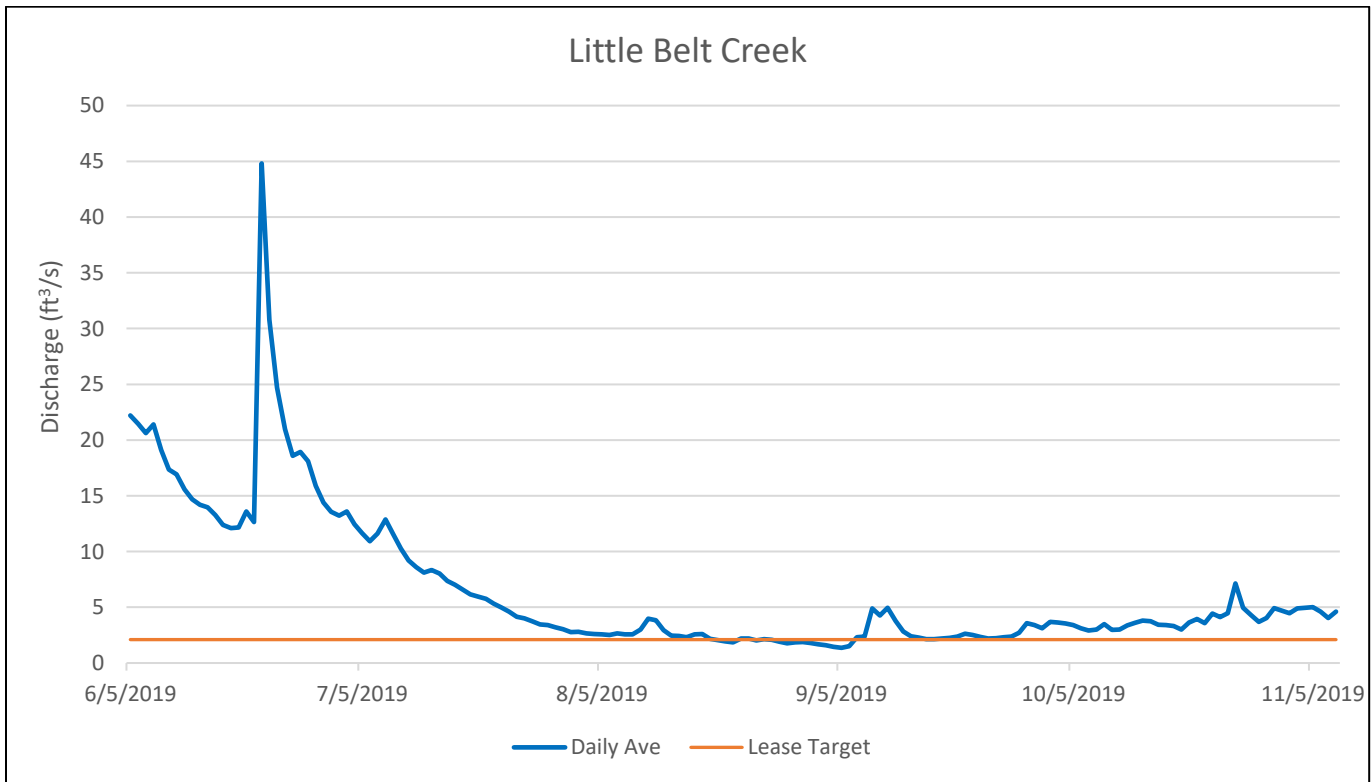


Fig.4. Average daily streamflow in comparison to 2.1 cfs lease target level.

The Change Authorization issued by DNRC required that a Project Completion Notice be filed by December 31, 2020. This Notice was filed a year early in November 2019 along with the required annual water measurement report.

**Little Belt Creek 2019**

Location: near Wilkin's western boundary

Lat. 47.39143 Long. 110.79162

TWP 19N, RGE 7E, SEC 23, DDAB

Average daily flow in cubic feet per second based on stage at 30-min. intervals.

Day	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
1					13.6	2.8	1.8	3.1	4.7
2					13.2	2.8	1.7	3.7	4.5
3					13.6	2.7	1.6	3.6	4.9
4					12.4	2.6	1.5	3.6	5.0
5				22.2	11.6	2.6	1.4	3.4	5.0
6				21.4	10.9	2.5	1.5	3.1	4.6
7				20.6	11.6	2.6	2.3	2.9	4.0
8				21.4	12.9	2.6	2.4	3.0	4.6
9				19.1	11.6	2.6	4.9	3.5	
10				17.3	10.3	3.0	4.3	3.0	
11				16.9	9.2	4.0	5.0	3.0	
12				15.6	8.6	3.8	3.8	3.4	
13				14.7	8.1	3.0	2.8	3.6	
14				14.2	8.3	2.5	2.4	3.8	
15				14.0	8.0	2.4	2.3	3.8	
16				13.3	7.4	2.3	2.2	3.4	
17				12.4	7.0	2.6	2.1	3.4	
18				12.1	6.6	2.6	2.2	3.3	
19				12.2	6.2	2.2	2.3	3.0	
20				13.6	6.0	2.1	2.4	3.6	
21				12.6	5.8	2.0	2.6	4.0	
22				44.8	5.3	1.8	2.5	3.6	
23				30.8	5.0	2.2	2.4	4.4	
24				24.7	4.6	2.2	2.2	4.1	
25				21.0	4.1	2.0	2.2	4.5	
26				18.6	4.0	2.1	2.3	7.1	
27				18.9	3.8	2.1	2.4	5.0	
28				18.1	3.5	1.9	2.7	4.3	
29				15.9	3.4	1.8	3.6	3.7	
30				14.4	3.2	1.9	3.4	4.0	
31					3.0	1.9		4.9	

**Little Belt Creek**

Location: near Wilkin's western boundary

Lat. 47.39143 Long.

110.79162

TWP 19N, RGE 7E, SEC 23, DDAB

Created: 11-14-

2019

Gage Height (ft.)	Discharge in ft <sup>3</sup> /s									
	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0				0.07	0.13	0.20	0.26	0.33	0.39	0.46
0.1	0.52	0.59	0.65	0.72	0.78	0.85	0.91	0.98	1.04	1.11
0.2	1.17	1.24	1.31	1.37	1.44	1.50	1.57	1.63	1.70	1.76
0.3	1.83	1.89	1.96	2.02	2.09	2.15	2.22	2.28	2.35	2.41
0.4	2.48	2.55	2.57	2.70	2.85	3.00	3.16	3.33	3.51	3.70
0.5	3.90	4.11	4.33	4.56	4.80	5.04	5.30	5.57	5.84	6.13
0.6	6.42	6.73	7.04	7.37	7.70	8.04	8.39	8.76	9.13	9.51
0.7	9.90	10.3	10.7	11.1	11.6	12.0	12.4	12.9	13.4	13.8
0.8	14.3	14.8	15.3	15.8	16.4	16.9	17.4	18.0	18.5	19.1
0.9	19.7	20.3	20.9	21.5	22.1	22.7	23.4	24.0	24.7	25.4
1.0	26.0	26.7	27.4	28.1	28.8	29.5	30.3	31.0	31.8	32.5
1.1	33.3	34.1	34.9	35.7	36.5	37.3	38.1	39.0	39.8	40.7
1.2	41.5	42.4	43.3	44.2	45.1	46.0	46.9	47.9	48.8	49.8