LYONS – MOORES CREEK ENHANCEMENTS

Ennis, MT

Attachment No.2

Moores Creek Hydrology
(10-Year & 100-Year Stream Flow Estimates)

USGS

Montana Flood-Frequency and Basin-Characteristic Data

Estimate Flood Discharges at Ungaged Sites in Montana -- (continued)

Summary of Estimation Parameters Selected:

Name for this estimation:	**Moores Creek**
Region:	**Southwest**
Estimation method:	**Weighted estimate based on Basin and Climatic Characteristics and Active-channel width**
Drainage area in square miles:	**31**
Percent basin above 6,000 feet:	**67.7**
Width of active channel in feet:	**7**

Flood Discharge Estimation:

(In the Flood Discharge table, RI is the Recurrence Interval, in years; STD ERR is the Standard Error; and 90% PRED. INTERVAL is the 90% Prediction Interval, in cubic feet per second)

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 METHOD: Regression on basin characteristics
 Flood frequency estimates for
 Moores Creek
Southwest Region: A =     31.00 E6 =    68.
 RI       DISCHARGE  STD ERR OF              90% PRED. INTERVAL
            (cfs)      PREDICTION(%)
     2        94.        90.9              25.6              348.
     5       172.        75.9              55.5              535.
    10       234.        72.6              78.5              699.
    25       325.        72.0             109.8              963.
    50       402.        73.5             133.2             1210.
   100       486.        75.9             156.6             1510.
   200       580.        79.1             179.6             1870.
   500       716.        84.6             208.4             2460.
```

METHOD: Regression on active channel width
Flood frequency estimates for
Moores Creek
Southwest Region: WAC = 7.00

RI	DISCHARGE (cfs)	STD ERR OF PREDICTION(%)	90% PRED. INTERVAL	
2	31.	60.6	12.2	79.
5	72.	57.4	29.7	176.
10	111.	63.0	42.1	291.
25	174.	73.5	58.0	521.
50	232.	82.4	69.8	773.
100	302.	91.6	82.0	1110.
200	384.	101.3	94.3	1560.
500	512.	115.3	110.2	2380.

METHOD: Combined methods 1 and 2
Flood frequency estimates for
Moores Creek
Region 8

RI	DISCHARGE (cfs)	STD ERR OF PREDICTION(%)	90% PRED. INTERVAL	
2	45.	50.0	20.2	99.
5	99.	47.4	46.5	211.
10	152.	51.3	67.4	342.
25	240.	57.8	97.3	590.
50	319.	62.8	121.0	839.
100	408.	67.7	145.5	1150.
200	508.	72.7	170.1	1520.
500	654.	79.8	201.3	2130.

Montana Flood-Frequency and Basin-Characteristic Data

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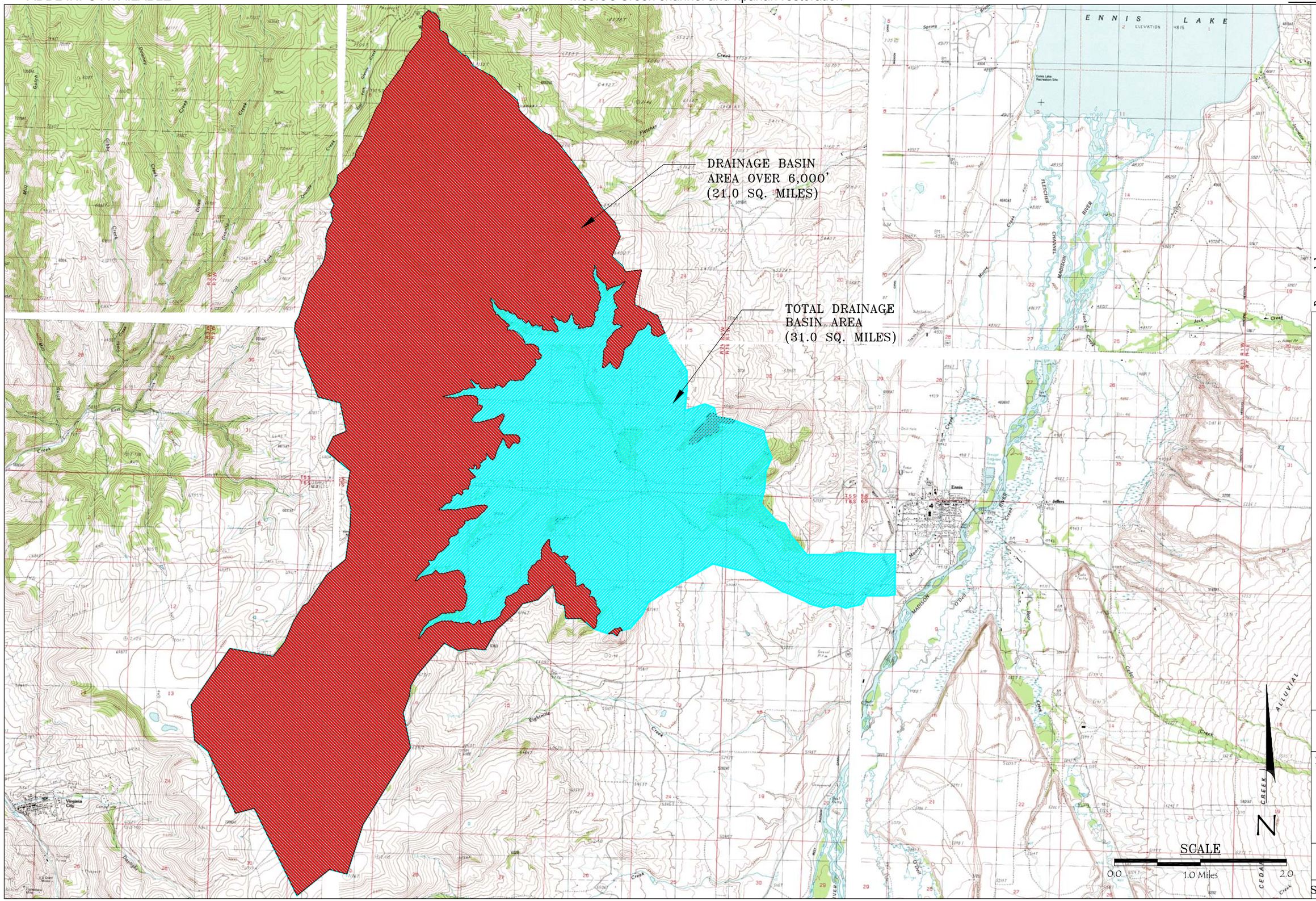

Prepared by:

Spanish Peaks Engineering & Consulting, LLC

Structural Civil Aquatic

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MOORES CREEK DRAINAGE BASIN AREA

LYONS – MOORES CREEK RESTOATION
MADISON COUNTY, MONTANA

date: 07/16
drawn by: DMS
checked by:

In Association With:

TERRAQUATIC

&

APPLIED GEOMORPHOLOGY

Prepared for:

DAVID LYONS

LYONS – MOORES CREEK ENHANCEMENTS

Ennis, MT

Attachment No.3

Moores Creek Hydraulic Analysis
(At-Section Hydraulic Calculations)

Including:

Existing Moores Creek Cross-Section Geometry
&
Proposed Moores Creek Cross-Section Geometry

And

Hydraulic Calculations for Reference Reach and Proposed Cross-Sections at Baseflow (3cfs), Bankfull (16.5 cfs), 10-Year (152 cfs), and 100 Year (406 cfs)

Cross-Section “A”: Typical Glide
Cross-Section “B”: Typical Pool
Cross-Section “C”: Typical Riffle
Cross-Section “D”: Typical In-Stream Work
Cross-Section “E”: Reference Reach No.1
Cross-Section “F”: Reference Reach No.2

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "C" @ 11+70)

SLOPE = 0.64%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,013.00	0.012	ROAD
0+24.02	5,013.00	0.012	ROAD
0+41.79	5,008.30	0.035	TALL GRASS
1+20.19	5,008.63	0.035	
2+50.14	5,008.91	0.035	
3+09.59	5,009.30	0.035	
4+05.82	5,007.92	0.035	
3+09.59	5,007.57	0.035	
4+86.44	5,008.50	0.035	
5+49.99	5,008.94	0.035	
5+68.38	5,009.06	0.035	
5+72.04	5,007.54	0.035	DITCH
5+74.44	5,007.48	0.035	
5+75.63	5,007.52	0.035	DITCH
5+82.11	5,008.66	0.035	
6+06.99	5,008.60	0.035	
6+09.87	5,007.52	0.035	
6+11.99	5,007.50	0.035	
6+16.15	5,008.63	0.035	
6+46.54	5,007.34	0.035	
6+52.49	5,007.10	0.035	
6+58.00	5,008.04	0.035	TALL GRASS
6+70.00	5,008.00	0.035	DITCH
6+72.29	5,006.40	0.035	DITCH
6+77.29	5,008.00	0.050	TREES
7+03.39	5,007.67	0.035	XSTG. CH
7+03.85	5,006.96	0.035	
7+03.99	5,006.52	0.035	
7+07.00	5,006.55	0.035	
7+08.51	5,007.10	0.012	
7+08.74	5,007.60	0.035	XSTG. CH
7+10.57	5,007.88	0.050	TREES
7+20.54	5,008.21	0.035	TALL GRASS
7+27.10	5,008.26	0.035	
7+36.85	5,008.33	0.035	
7+52.91	5,007.92	0.035	
7+59.17	5,007.80	0.035	TALL GRASS
8+04.18	5,008.08	0.012	DRIVEWAY
8+30.86	5,008.46	0.012	DRIVEWAY
8+53.97	5,009.58	0.030	GRASS
9+26.72	5,008.79	0.030	GRASS
9+64.81	5,005.77	0.035	TALL GRASS
9+81.24	5,006.49	0.035	
9+99.38	5,006.02	0.035	
10+21.51	5,013.89	0.035	
10+28.37	5,013.72	0.035	TALL GRASS
10+35.83	5,010.28	0.035	TALL GRASS
10+37.85	5,008.14	0.035	CANAL
10+49.51	5,008.78	0.035	CANAL
10+52.09	5,013.78	0.035	CANAL
10+59.83	5,018.75	0.035	TALL GRASS
10+88.34	5,025.61	0.035	TALL GRASS

LYONS - MOORES CREEK - EXISTING
(X-SECTION "D" @ 13+50)

SLOPE = 0.45%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,014.50	0.012	ROAD
0+23.56	5,014.50	0.012	ROAD
0+54.81	5,010.33	0.035	TALL GRASS
1+25.79	5,010.66	0.035	
2+38.04	5,010.33	0.035	
3+62.45	5,011.08	0.035	
4+28.17	5,009.78	0.035	
4+97.03	5,009.24	0.035	
5+24.36	5,010.28	0.035	
5+46.03	5,009.09	0.035	
5+49.04	5,008.87	0.035	DITCH
5+51.06	5,008.90	0.035	DITCH
5+57.62	5,010.79	0.035	
5+62.46	5,010.29	0.035	
6+06.37	5,008.11	0.035	
6+15.60	5,008.65	0.035	
6+46.85	5,008.58	0.035	TALL GRASS
6+55.42	5,007.74	0.035	XSTG. CH
6+55.71	5,007.65	0.035	
6+63.92	5,007.50	0.035	
6+69.06	5,007.46	0.035	
6+69.53	5,007.76	0.035	XSTG. CH
6+72.61	5,008.54	0.035	TALL GRASS
6+82.77	5,009.51	0.035	
7+10.61	5,009.24	0.035	
7+28.80	5,009.38	0.035	TALL GRASS
7+64.82	5,009.34	0.012	DRIVEWAY
7+89.23	5,009.34	0.012	DRIVEWAY
8+16.73	5,008.93	0.035	TALL GRASS
8+75.83	5,008.47	0.050	TREES
9+83.41	5,013.43	0.050	TREES
9+89.59	5,015.16	0.050	TREES
9+93.14	5,015.36	0.050	TREES
10+03.56	5,010.57	0.035	CANAL
10+07.09	5,010.38	0.035	CANAL
10+10.09	5,008.19	0.035	CANAL
10+22.85	5,008.20	0.035	CANAL
10+24.38	5,012.00	0.035	CANAL
10+29.67	5,016.06	0.035	TALL GRASS
10+57.82	5,021.28	0.035	TALL GRASS

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "E" - REF. NO.1 @ 20+50)

SLOPE = 0.58%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,018.30	0.012	ROAD
0+33.95	5,018.30	0.012	ROAD
0+81.40	5,014.84	0.035	TALL GRASS
0+96.24	5,013.80	0.035	
1+09.01	5,014.80	0.035	
1+39.71	5,015.15	0.035	
1+44.50	5,015.22	0.035	
1+67.56	5,016.01	0.035	
2+19.24	5,016.49	0.035	
2+50.32	5,016.43	0.035	
2+62.83	5,016.29	0.035	
2+74.21	5,016.54	0.035	
3+04.81	5,016.32	0.035	TALL GRASS
3+16.00	5,014.02	0.035	CANAL
3+17.34	5,011.32	0.035	CANAL
3+28.12	5,011.28	0.035	CANAL
3+39.30	5,012.32	0.035	CANAL
3+40.50	5,013.52	0.035	CANAL
3+51.94	5,017.26	0.035	TALL GRASS
3+58.37	5,017.15	0.035	
3+61.66	5,016.18	0.035	
3+68.87	5,016.08	0.035	
3+90.59	5,015.70	0.035	
4+29.29	5,015.55	0.035	TALL GRASS
4+67.18	5,015.54	0.100	DENSE BRUSH
4+89.15	5,011.47	0.040	XSTG. CH
4+89.60	5,011.23	0.040	XSTG. CH
4+94.20	5,010.91	0.040	XSTG. CH
4+96.72	5,011.20	0.040	XSTG. CH
4+97.23	5,011.59	0.040	XSTG. CH
5+03.76	5,015.10	0.100	DENSE BRUSH
5+13.99	5,015.06	0.100	DENSE BRUSH
5+26.11	5,015.45	0.100	DENSE BRUSH
5+39.93	5,018.66	0.035	TALL GRASS
5+62.39	5,021.69	0.035	
5+68.55	5,022.60	0.035	
5+72.15	5,023.60	0.035	
6+13.00	5,024.48	0.035	
6+30.92	5,027.19	0.035	
6+44.61	5,033.48	0.035	
6+62.06	5,034.68	0.035	
6+86.81	5,042.08	0.035	TALL GRASS

LYONS - MOORES CREEK - EXISTING
(X-SECTION "F" - REF. NO.2 @ 23+50)

SLOPE = 1.42%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,021.00	0.012	ROAD
0+28.26	5,021.00	0.012	ROAD
0+40.09	5,018.61	0.035	TALL GRASS
0+76.20	5,018.33	0.035	
1+11.36	5,017.38	0.035	
1+24.03	5,019.34	0.035	
1+31.32	5,019.30	0.035	
1+43.66	5,018.29	0.035	
1+87.72	5,018.53	0.035	
2+19.10	5,019.90	0.035	TALL GRASS
2+51.11	5,019.66	0.100	DENSE BRUSH
2+68.58	5,017.61	0.100	DENSE BRUSH
2+82.69	5,018.12	0.100	DENSE BRUSH
2+90.27	5,015.23	0.040	XSTG. CH
2+90.76	5,014.86	0.040	XSTG. CH
2+94.36	5,014.64	0.040	XSTG. CH
2+96.65	5,014.94	0.040	XSTG. CH
2+97.14	5,015.46	0.040	XSTG. CH
3+01.68	5,018.63	0.100	DENSE BRUSH
3+21.65	5,018.58	0.100	DENSE BRUSH
3+33.32	5,019.76	0.100	DENSE BRUSH
3+41.90	5,021.86	0.035	TALL GRASS
3+63.31	5,025.43	0.035	
3+75.77	5,026.98	0.035	
4+04.92	5,032.11	0.035	
4+15.44	5,032.97	0.035	
4+23.47	5,032.80	0.035	
4+76.73	5,041.65	0.035	
5+26.00	5,053.27	0.035	TALL GRASS

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LYONS - MOORES CREEK -EX STING
(X-SECTION "A" @ 4+65)

SLOPE = 1.16%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,007.50	0.012	ROAD
0+31.73	5,007.50	0.012	ROAD
0+44.56	5,005.00	0.035	TALL GRASS
2+31.96	5,004.68	0.035	
4+21.03	5,004.08	0.035	
6+74.93	5,003.55	0.035	
6+80.46	5,002.53	0.035	DITCH
6+87.22	5,003.84	0.035	
7+31.81	5,003.16	0.035	
7+89.66	5,003.05	0.035	
8+51.14	5,002.61	0.035	
8+99.15	5,002.37	0.035	
9+44.43	5,001.53	0.035	
9+67.73	5,001.45	0.035	
9+70.10	5,001.38	0.035	
9+72.59	5,000.61	0.035	
9+73.36	5,000.03	0.035	
9+74.11	4,999.84	0.035	DITCH
9+74.85	4,999.99	0.035	DITCH
9+75.38	5,000.19	0.035	
9+75.86	5,000.74	0.035	
9+77.91	5,001.30	0.035	
10+00.25	5,001.12	0.035	
10+53.56	5,000.74	0.035	
10+90.15	5,000.15	0.035	
11+03.98	4,999.68	0.035	
11+06.75	4,999.43	0.035	
11+07.86	4,999.41	0.035	
11+08.81	4,999.45	0.035	
11+12.39	4,999.84	0.035	
11+31.07	4,999.63	0.035	
11+44.86	4,999.59	0.100	BRUSH
11+59.38	5,000.00	0.100	BRUSH
11+75.48	5,001.50	0.100	BRUSH
11+91.28	5,000.90	0.040	XSTG. CH
11+95.00	5,000.10	0.040	
11+97.00	5,001.00	0.040	XSTG. CH.
12+05.56	5,001.07	0.100	BRUSH
12+13.91	5,002.06	0.035	TALL GRASS
12+28.21	5,001.80	0.035	
12+34.70	5,001.72	0.035	
12+23.00	5,002.00	0.012	DRIVEWAY
12+38.00	5,002.00	0.012	DRIVEWAY
12+40.00	5,001.63	0.035	TALL GRASS
12+42.36	5,001.06	0.035	
12+45.18	5,001.05	0.035	
12+48.73	5,000.24	0.035	
12+64.09	4,999.35	0.035	
12+87.51	4,999.41	0.035	
13+20.00	5,002.00	0.035	
13+65.38	5,006.00	0.035	
13+89.19	5,007.50	0.035	TALL GRASS

LYONS - MOORES CREEK - EXISTING
(X-SECTION "B" @ 8+75)

SLOPE = 0.75%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,011.00	0.012	ROAD
0+30.53	5,011.00	0.012	ROAD
0+48.91	5,007.50	0.035	TALL GRASS
3+70.95	5,006.47	0.035	
3+84.63	5,006.17	0.035	
3+97.23	5,006.06	0.035	
4+15.96	5,006.46	0.035	
4+71.22	5,006.95	0.035	
6+01.68	5,007.58	0.035	
6+10.02	5,005.76	0.035	DITCH
6+16.48	5,007.22	0.035	
6+43.42	5,007.13	0.035	
6+60.60	5,007.03	0.035	
7+05.50	5,006.84	0.035	
7+37.74	5,006.77	0.035	
7+77.91	5,005.51	0.035	
7+97.07	5,005.06	0.035	
8+00.83	5,004.52	0.035	
8+02.03	5,004.25	0.035	DITCH
8+04.36	5,004.24	0.035	DITCH
8+09.75	5,004.38	0.035	
8+10.11	5,004.60	0.035	
8+12.57	5,005.00	0.035	
8+17.86	5,005.82	0.035	
8+38.11	5,005.85	0.035	
8+39.31	5,005.13	0.035	
8+42.30	5,005.90	0.035	
8+48.38	5,005.94	0.035	TALL GRASS
8+48.91	5,006.02	0.100	BRUSH
9+00.64	5,005.30	0.040	XSTG. CH
9+05.85	5,004.50	0.040	XSTG. CH.
9+12.37	5,005.00	0.040	XSTG. CH.
9+24.00	5,005.35	0.100	BRUSH
9+52.17	5,005.44	0.035	TALL GRASS
9+87.46	5,003.85	0.035	TALL GRASS
10+01.74	5,003.92	0.035	TALL GRASS
10+10.91	5,005.41	0.035	
10+15.34	5,005.34	0.012	DRIVEWAY
10+30.27	5,005.34	0.012	DRIVEWAY
10+34.12	5,004.91	0.035	GRASS
10+35.96	5,004.25	0.035	
10+40.42	5,003.55	0.035	
10+66.56	5,012.98	0.035	TALL GRASS
10+74.45	5,013.80	0.035	CANAL
11+00.14	5,014.53	0.035	CANAL

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "E" - REF. NO.1 @ 20+50)

SLOPE = 0.58%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,018.30	0.012	ROAD
0+33.95	5,018.30	0.012	ROAD
0+81.40	5,014.84	0.035	TALL GRASS
0+96.24	5,013.80	0.035	
1+09.01	5,014.80	0.035	
1+39.71	5,015.15	0.035	
1+44.50	5,015.22	0.035	
1+67.56	5,016.01	0.035	
2+19.24	5,016.49	0.035	
2+50.32	5,016.43	0.035	
2+62.83	5,016.29	0.035	
2+74.21	5,016.54	0.035	
3+04.81	5,016.32	0.035	TALL GRASS
3+16.00	5,014.02	0.035	CANAL
3+17.34	5,011.32	0.035	CANAL
3+28.12	5,011.28	0.035	CANAL
3+39.30	5,012.32	0.035	CANAL
3+40.50	5,013.52	0.035	CANAL
3+51.94	5,017.26	0.035	TALL GRASS
3+58.37	5,017.15	0.035	
3+61.66	5,016.18	0.035	
3+68.87	5,016.08	0.035	
3+90.59	5,015.70	0.035	
4+29.29	5,015.55	0.035	TALL GRASS
4+67.18	5,015.54	0.100	DENSE BRUSH
4+89.15	5,011.47	0.040	XSTG. CH
4+89.60	5,011.23	0.040	XSTG. CH
4+94.20	5,010.91	0.040	XSTG. CH
4+96.72	5,011.20	0.040	XSTG. CH
4+97.23	5,011.59	0.040	XSTG. CH
5+03.76	5,015.10	0.100	DENSE BRUSH
5+13.99	5,015.06	0.100	DENSE BRUSH
5+26.11	5,015.45	0.100	DENSE BRUSH
5+39.93	5,018.66	0.035	TALL GRASS
5+62.39	5,021.69	0.035	
5+68.55	5,022.60	0.035	
5+72.15	5,023.60	0.035	
6+13.00	5,024.48	0.035	
6+30.92	5,027.19	0.035	
6+44.61	5,033.48	0.035	
6+62.06	5,034.68	0.035	
6+86.81	5,042.08	0.035	TALL GRASS

LYONS - MOORES CREEK - EXISTING
(X-SECTION "F" - REF. NO.2 @ 23+50)

SLOPE = 1.42%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,021.00	0.012	ROAD
0+28.26	5,021.00	0.012	ROAD
0+40.09	5,018.61	0.035	TALL GRASS
0+76.20	5,018.33	0.035	
1+11.36	5,017.38	0.035	
1+24.03	5,019.34	0.035	
1+31.32	5,019.30	0.035	
1+43.66	5,018.29	0.035	
1+87.72	5,018.53	0.035	
2+19.10	5,019.90	0.035	TALL GRASS
2+51.11	5,019.66	0.100	DENSE BRUSH
2+68.58	5,017.61	0.100	DENSE BRUSH
2+82.69	5,018.12	0.100	DENSE BRUSH
2+90.27	5,015.23	0.040	XSTG. CH
2+90.76	5,014.86	0.040	XSTG. CH
2+94.36	5,014.64	0.040	XSTG. CH
2+96.65	5,014.94	0.040	XSTG. CH
2+97.14	5,015.46	0.040	XSTG. CH
3+01.68	5,018.63	0.100	DENSE BRUSH
3+21.65	5,018.58	0.100	DENSE BRUSH
3+33.32	5,019.76	0.100	DENSE BRUSH
3+41.90	5,021.86	0.035	TALL GRASS
3+63.31	5,025.43	0.035	
3+75.77	5,026.98	0.035	
4+04.92	5,032.11	0.035	
4+15.44	5,032.97	0.035	
4+23.47	5,032.80	0.035	
4+76.73	5,041.65	0.035	
5+26.00	5,053.27	0.035	TALL GRASS

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LYONS - MOORES CREEK - PROPOSED
(X-SECTION "A" @ 5+70)
SLOPE = 0.33%
NEW ALIGNMENT: GLIDE - TYPICAL

Station	Elevation	Starting N-Value	Comments
0+00.00	5,007.50	0.012	ROAD
0+31.73	5,007.50	0.012	ROAD
0+44.56	5,005.00	0.035	TALL GRASS
2+31.96	5,004.68	0.035	
4+21.03	5,004.08	0.035	
6+74.93	5,003.55	0.035	
6+80.46	5,002.53	0.035	DITCH
6+87.22	5,003.84	0.035	
7+31.81	5,003.16	0.035	
7+89.66	5,003.05	0.035	
8+51.14	5,002.61	0.035	
8+99.15	5,002.37	0.035	
9+44.43	5,001.53	0.035	
9+67.73	5,001.45	0.035	
9+70.10	5,001.38	0.035	
9+72.59	5,000.61	0.035	
9+73.36	5,000.03	0.035	
9+74.11	4,999.84	0.035	DITCH
9+74.85	4,999.99	0.035	DITCH
9+75.38	5,000.19	0.035	
9+75.86	5,000.74	0.035	
9+77.91	5,001.30	0.035	
10+00.25	5,001.12	0.035	
10+53.56	5,000.74	0.035	
10+90.15	5,000.15	0.035	
11+03.98	4,999.68	0.035	
11+06.75	4,999.43	0.035	
11+07.86	4,999.41	0.035	
11+08.81	4,999.45	0.035	
11+12.39	4,999.84	0.035	
11+31.07	4,999.63	0.035	
11+44.86	4,999.59	0.100	DENSE BRUSH
11+59.38	5,000.00	0.100	DENSE BRUSH
11+75.48	5,001.50	0.100	DENSE BRUSH
11+91.28	5,000.90	0.040	ORIG. CH
11+95.00	5,000.10	0.040	ORIG. CH
11+97.00	5,001.00	0.040	ORIG. CH - MATCH
12+03.90	5,000.60	0.035	TOE - INSET BENCH
12+08.00	5,000.50	0.035	TOB
12+09.10	4,999.00	0.040	EOW
12+13.50	4,998.80	0.040	TLWG
12+15.40	4,999.00	0.040	EOW
12+16.00	5,000.30	0.035	TOB
12+29.10	5,000.40	0.035	TOE - INSET BENCH
12+41.20	5,000.50	0.012	DRIVEWAY
12+65.20	5,000.50	0.012	DRIVEWAY
12+71.47	4,998.82	0.035	MATCH EXISTING
12+87.51	4,999.41	0.035	
13+20.00	5,002.00	0.035	
13+65.38	5,006.00	0.035	
13+89.19	5,007.50	0.035	TALL GRASS

LYONS - MOORES CREEK - PROPOSED
(X-SECTION "B" @ 9+80)
SLOPE = 0.57%
NEW ALIGNMENT: POOL - TYPICAL

Station	Elevation	Starting N-Value	Comments
0+00.00	5,011.00	0.012	ROAD
0+30.53	5,011.00	0.012	ROAD
0+48.91	5,007.50	0.035	TALL GRASS
3+70.95	5,006.47	0.035	
3+84.63	5,006.17	0.035	
3+97.23	5,006.06	0.035	
4+15.96	5,006.46	0.035	
4+71.22	5,006.95	0.035	
6+01.68	5,007.58	0.035	
6+10.02	5,005.76	0.035	DITCH
6+16.48	5,007.22	0.035	
6+43.42	5,007.13	0.035	
6+60.60	5,007.03	0.035	
7+05.50	5,006.84	0.035	
7+37.74	5,006.77	0.035	
7+77.91	5,005.51	0.035	
7+97.07	5,005.06	0.035	
8+00.83	5,004.52	0.035	
8+02.03	5,004.25	0.035	DITCH
8+04.36	5,004.24	0.035	DITCH
8+09.75	5,004.38	0.035	
8+10.11	5,004.60	0.035	
8+12.57	5,005.00	0.035	
8+17.86	5,005.82	0.035	
8+38.11	5,005.85	0.035	
8+39.31	5,005.13	0.035	
8+42.30	5,005.90	0.035	
8+48.38	5,005.94	0.035	
8+48.91	5,006.02	0.100	DENSE BRUSH
9+00.64	5,005.30	0.040	ORIG. CH
9+05.85	5,004.50	0.040	ORIG. CH
9+12.37	5,005.00	0.040	ORIG. CH
9+24.00	5,005.35	0.100	DENSE BRUSH
9+30.85	5,005.40	0.035	MATCH XSTG
9+51.08	5,004.20	0.035	TOE - INSET BENCH
9+82.50	5,004.10	0.035	TOB
9+83.40	5,002.90	0.040	EOW
9+88.64	5,002.40	0.040	TLWG
9+90.11	5,002.90	0.040	EOW
9+91.00	5,003.85	0.035	TOB
9+94.24	5,003.90	0.035	TOE - INSET BENCH
10+00.50	5,003.90	0.035	MATCH EXISTING
10+10.91	5,005.31	0.035	
10+15.34	5,005.34	0.012	DRIVEWAY
10+30.27	5,005.34	0.012	DRIVEWAY
10+34.12	5,004.91	0.035	GRASS
10+35.96	5,004.25	0.035	
10+40.42	5,003.55	0.035	
10+66.56	5,012.98	0.035	TALL GRASS
10+74.45	5,013.80	0.035	CANAL
11+00.14	5,014.53	0.035	CANAL

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LYONS - MOORES CREEK: PROPOSED
(X-SECTION "C" @ 12+90)
NEW ALIGNMENT: RIFFLE - TYPICAL
SLOPE = 1.11%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,013.00	0.012	ROAD
0+24.02	5,013.00	0.012	ROAD
0+41.79	5,008.30	0.035	TALL GRASS
1+20.19	5,008.63	0.035	
2+50.14	5,008.91	0.035	
3+09.59	5,009.30	0.035	
4+05.82	5,007.92	0.035	
4+25.39	5,007.57	0.035	
4+86.44	5,008.50	0.035	
5+49.99	5,008.94	0.035	
5+68.38	5,009.06	0.035	
5+72.04	5,007.54	0.035	DITCH
5+74.44	5,007.48	0.035	
5+75.63	5,007.52	0.035	DITCH
5+82.11	5,008.66	0.035	
6+06.99	5,008.60	0.035	
6+09.87	5,007.52	0.035	
6+11.99	5,007.50	0.035	
6+16.15	5,008.63	0.035	
6+46.54	5,007.34	0.035	
6+52.49	5,007.10	0.035	
6+58.00	5,008.04	0.035	TALL GRASS
6+70.00	5,008.00	0.035	DITCH
6+72.29	5,006.40	0.035	DITCH
6+77.29	5,008.00	0.050	TREES
7+03.39	5,007.67	0.035	ORIG. CH
7+03.85	5,006.96	0.035	
7+03.99	5,006.52	0.035	
7+07.00	5,006.55	0.035	
7+08.51	5,007.10	0.012	
7+08.74	5,007.60	0.035	ORIG. CH
7+10.57	5,007.88	0.050	TREES
7+20.54	5,008.21	0.035	TALL GRASS
7+35.97	5,008.00	0.035	MATCH XSTG.
7+62.64	5,007.00	0.035	TOE - INSET BENCH
7+67.51	5,006.90	0.035	TOB
7+68.00	5,005.80	0.035	EOW
7+72.82	5,005.30	0.035	TLWG
7+75.00	5,005.80	0.035	EOW
7+75.82	5,006.90	0.035	TOB
7+79.56	5,007.00	0.035	TOE - INSET BENCH
7+92.05	5,007.80	0.035	MATCH EXISTING
8+04.18	5,008.08	0.012	DRIVEWAY
8+30.86	5,008.46	0.012	DRIVEWAY
8+53.97	5,009.58	0.030	SHORT GRASS
9+26.72	5,008.79	0.030	SHORT GRASS
9+64.81	5,005.77	0.035	TALL GRASS
9+81.24	5,006.49	0.035	
9+99.38	5,006.02	0.035	
10+21.51	5,013.89	0.035	
10+28.37	5,013.72	0.035	TALL GRASS
10+35.83	5,010.28	0.035	TALL GRASS
10+37.85	5,008.14	0.035	CANAL
10+49.51	5,008.78	0.035	CANAL
10+52.09	5,013.78	0.035	CANAL
10+59.83	5,018.75	0.035	TALL GRASS
10+88.34	5,025.61	0.035	TALL GRASS

LYONS - MOORES CREEK - PROPOSED
(X-SECTION "D" - @ 15+05)
EXISTING ALIGNMENT: REGRADED REACH
SLOPE = 0.57%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,014.50	0.012	ROAD
0+23.56	5,014.50	0.012	ROAD
0+54.81	5,010.33	0.035	TALL GRASS
1+25.79	5,010.66	0.035	
2+38.04	5,010.33	0.035	
3+62.45	5,011.08	0.035	
4+28.17	5,009.78	0.035	
4+97.03	5,009.24	0.035	
5+24.36	5,010.28	0.035	
5+46.03	5,009.09	0.035	
5+49.04	5,008.87	0.035	DITCH
5+51.06	5,008.90	0.035	DITCH
5+57.62	5,010.79	0.035	
5+62.46	5,010.29	0.035	
6+06.37	5,008.11	0.035	
6+15.60	5,008.65	0.035	
6+46.85	5,007.20	0.035	RE-GRADE
6+55.42	5,006.14	0.035	XSTG. CHANNEL
6+55.71	5,006.05	0.035	
6+63.92	5,005.60	0.035	
6+69.06	5,005.86	0.035	
6+69.53	5,006.16	0.035	XSTG, CHANNEL
6+72.61	5,007.20	0.035	RE-GRADE
6+82.77	5,008.50	0.035	RE-GRADE
7+10.61	5,009.24	0.035	
7+28.80	5,009.38	0.035	TALL GRASS
7+64.82	5,009.34	0.012	DRIVEWAY
7+89.23	5,009.34	0.012	DRIVEWAY
8+16.73	5,008.93	0.035	TALL GRASS
8+75.83	5,008.47	0.050	TREES
9+83.41	5,013.43	0.050	TREES
9+89.59	5,015.16	0.050	TREES
9+93.14	5,015.36	0.050	TREES
10+03.56	5,010.57	0.035	CANAL
10+07.09	5,010.38	0.035	CANAL
10+10.09	5,008.19	0.035	CANAL
10+22.85	5,008.20	0.035	CANAL
10+24.38	5,012.00	0.035	CANAL
10+29.67	5,016.06	0.035	TALL GRASS
10+57.82	5,021.28	0.035	TALL GRASS

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LYONS - MOORES CREEK -EXISTING
(X-SECTION "A" @ 4+65)
SLOPE = 1.16%

Station	Elevation	Value	Comments
0+00.00	5,007.50	0.012	ROAD
0+31.73	5,007.50	0.012	ROAD
0+44.56	5,005.00	0.035	TALL GRASS
2+31.96	5,004.68	0.035	
4+21.03	5,004.08	0.035	
6+74.93	5,003.55	0.035	
6+80.46	5,002.53	0.035	DITCH
6+87.22	5,003.84	0.035	
7+31.81	5,003.16	0.035	
7+89.66	5,003.05	0.035	
8+51.14	5,002.61	0.035	
8+99.15	5,002.37	0.035	
9+44.43	5,001.53	0.035	
9+67.73	5,001.45	0.035	
9+70.10	5,001.38	0.035	
9+72.59	5,000.61	0.035	
9+73.36	5,000.03	0.035	
9+74.11	4,999.84	0.035	DITCH
9+74.85	4,999.99	0.035	DITCH
9+75.38	5,000.19	0.035	
9+75.86	5,000.74	0.035	
9+77.91	5,001.30	0.035	
10+00.25	5,001.12	0.035	
10+53.56	5,000.74	0.035	
10+90.15	5,000.15	0.035	
11+03.98	4,999.68	0.035	
11+06.75	4,999.43	0.035	
11+07.86	4,999.41	0.035	
11+08.81	4,999.45	0.035	
11+12.39	4,999.84	0.035	
11+31.07	4,999.63	0.035	
11+44.86	4,999.59	0.100	DENSE BRUSH
11+59.38	5,000.00	0.100	DENSE BRUSH
11+75.48	5,001.50	0.100	DENSE BRUSH
11+91.28	5,000.90	0.040	XSTG. CH
11+95.00	5,000.10	0.040	
11+97.00	5,001.00	0.040	XSTG. CH.
12+05.56	5,001.07	0.100	DENSE BRUSH
12+13.91	5,002.06	0.035	TALL GRASS
12+28.21	5,001.80	0.035	
12+34.70	5,001.72	0.035	
12+23.00	5,002.00	0.012	DRIVEWAY
12+38.00	5,002.00	0.012	DRIVEWAY
12+40.00	5,001.63	0.035	TALL GRASS
12+42.36	5,001.06	0.035	
12+45.18	5,001.05	0.035	
12+48.73	5,000.24	0.035	
12+64.09	4,999.35	0.035	
12+87.51	4,999.41	0.035	
13+20.00	5,002.00	0.035	
13+65.38	5,006.00	0.035	
13+89.19	5,007.50	0.035	TALL GRASS

LYONS - MOORES CREEK - PROPOSED
(X-SECTION "A" @ 5+70)
SLOPE = 0.33%
NEW ALIGNMENT: GLIDE - TYPICAL

Station	Elevation	Value	Comments
0+00.00	5,007.50	0.012	ROAD
0+31.73	5,007.50	0.012	ROAD
0+44.56	5,005.00	0.035	TALL GRASS
2+31.96	5,004.68	0.035	
4+21.03	5,004.08	0.035	
6+74.93	5,003.55	0.035	
6+80.46	5,002.53	0.035	DITCH
6+87.22	5,003.84	0.035	
7+31.81	5,003.16	0.035	
7+89.66	5,003.05	0.035	
8+51.14	5,002.61	0.035	
8+99.15	5,002.37	0.035	
9+44.43	5,001.53	0.035	
9+67.73	5,001.45	0.035	
9+70.10	5,001.38	0.035	
9+72.59	5,000.61	0.035	
9+73.36	5,000.03	0.035	
9+74.11	4,999.84	0.035	DITCH
9+74.85	4,999.99	0.035	DITCH
9+75.38	5,000.19	0.035	
9+75.86	5,000.74	0.035	
9+77.91	5,001.30	0.035	
10+00.25	5,001.12	0.035	
10+53.56	5,000.74	0.035	
10+90.15	5,000.15	0.035	
11+03.98	4,999.68	0.035	
11+06.75	4,999.43	0.035	
11+07.86	4,999.41	0.035	
11+08.81	4,999.45	0.035	
11+12.39	4,999.84	0.035	
11+31.07	4,999.63	0.035	
11+44.86	4,999.59	0.100	DENSE BRUSH
11+59.38	5,000.00	0.100	DENSE BRUSH
11+75.48	5,001.50	0.100	DENSE BRUSH
11+91.28	5,000.90	0.040	ORIG. CH
11+95.00	5,000.10	0.040	ORIG. CH
11+97.00	5,001.00	0.040	MATCH
12+03.90	5,000.60	0.035	BENCH
12+08.00	5,000.50	0.035	TOB
12+09.10	4,999.00	0.040	EOW
12+13.50	4,998.80	0.040	TLWG
12+15.40	4,999.00	0.040	EOW
12+16.00	5,000.30	0.035	TOB
12+29.10	5,000.40	0.035	BENCH
12+41.20	5,000.50	0.012	DRIVEWAY
12+65.20	5,000.50	0.012	DRIVEWAY
12+71.47	4,998.82	0.035	EXISTING
12+87.51	4,999.41	0.035	
13+20.00	5,002.00	0.035	
13+65.38	5,006.00	0.035	
13+89.19	5,007.50	0.035	TALL GRASS

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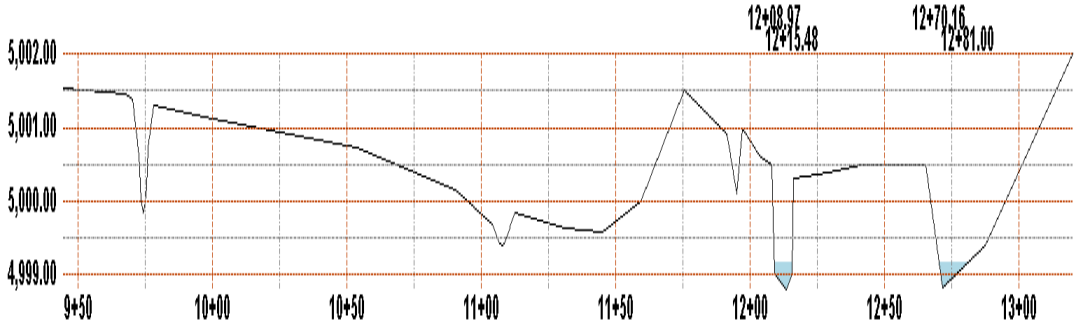
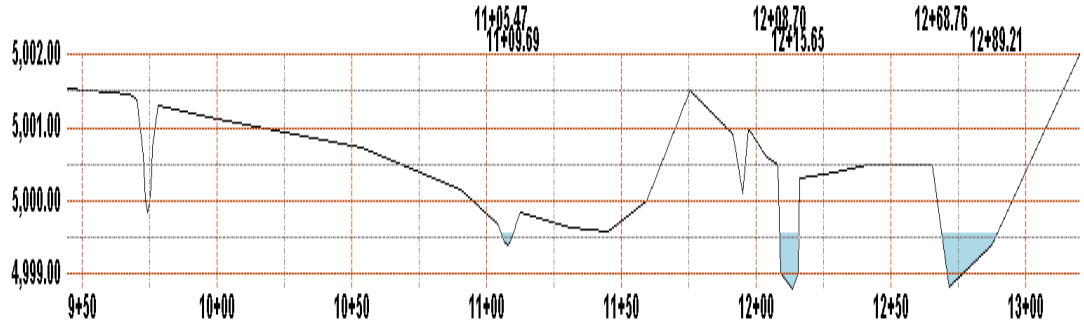
MOORES CREEK - SECTION "A" - PROPOSED (BASE FLOW - 3 CFS)



MOORES CREEK - SECTION "A" - PROPOSED (OHW FLOW - 16.5 CFS)



MOORES CREEK SECTION "A" - PROPOSED
BASE FLOW (3 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0359	
Manning N Method	Cox/USACE	
Channel Slope	0.33	%
Normal Depth	0.37	ft
Discharge	3	cfs
Water Surface Elevation	4,999.17	ft
Channel Depth	2.73	ft
Channel Width	375.57	ft
Flow Area	3.62	sq.ft.
Wetted Perimeter	17.6	ft
Top Width	17.34	ft
Hydraulic Depth	0.209	ft
Hydraulic Radius	0.206	ft
Critical Depth	0.23	ft
Critical Slope	3.97407	%
Velocity	0.83	ft/s
Velocity Head	0.01	ft
Specific Energy	0.38	ft
Froude Number	0.32	
Velocity Depth Product	0.31	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "A" - PROPOSED
ORDINARY HIGH WATER (16.5 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0348	
Manning N Method	Cox/USACE	
Channel Slope	0.33	%
Normal Depth	0.75	ft
Discharge	16.5	cfs
Water Surface Elevation	4,999.55	ft
Channel Depth	2.73	ft
Channel Width	375.57	ft
Flow Area	12.62	sq.ft.
Wetted Perimeter	32.39	ft
Top Width	31.63	ft
Hydraulic Depth	0.399	ft
Hydraulic Radius	0.39	ft
Critical Depth	0.47	ft
Critical Slope	2.91906	%
Velocity	1.31	ft/s
Velocity Head	0.03	ft
Specific Energy	0.77	ft
Froude Number	0.365	
Velocity Depth Product	0.97	sq.ft./s
Flow Type	Sub-Critical	

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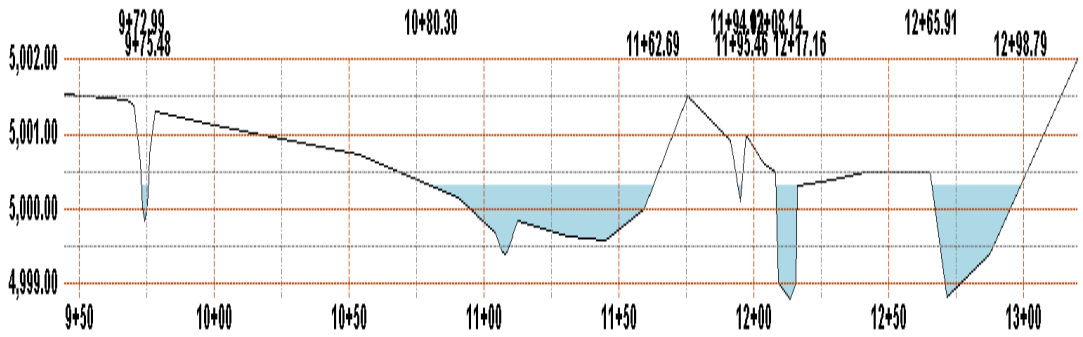
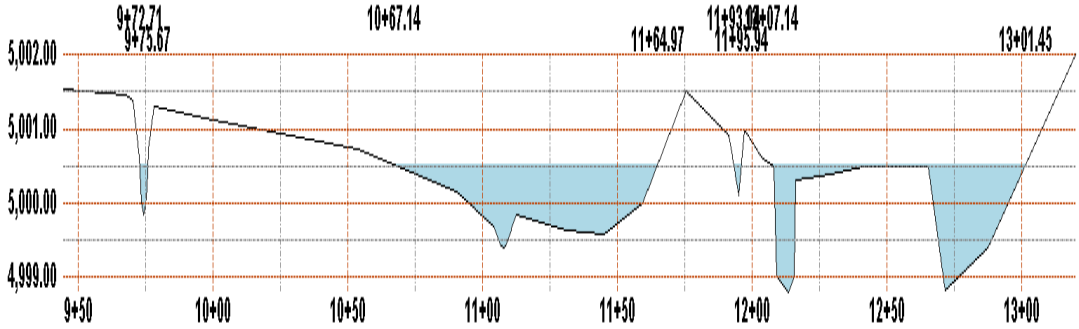
MOORES CREEK - SECTION "A" - PROPOSED (BANKFULL - 90 CFS)



MOORES CREEK - SECTION "A" - PROPOSED (10 YR FLOW - 152 CFS)



MOORES CREEK SECTION "A" - PROPOSED
BANKFULL (90 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0429	
Manning N Method	Cox/USACE	
Channel Slope	0.33	%
Normal Depth	1.51	ft
Discharge	115	cfs
Water Surface Elevation	5,000.31	ft
Channel Depth	2.73	ft
Channel Width	375.57	ft
Flow Area	80	sq.ft.
Wetted Perimeter	130.32	ft
Top Width	128.21	ft
Hydraulic Depth	0.624	ft
Hydraulic Radius	0.614	ft
Critical Depth	1.08	ft
Critical Slope	3.07619	%
Velocity	1.44	ft/s
Velocity Head	0.03	ft
Specific Energy	1.54	ft
Froude Number	0.321	
Velocity Depth Product	2.17	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "A" - PROPOSED
10 YEAR (152 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0432	
Manning N Method	Cox/USACE	
Channel Slope	0.33	%
Normal Depth	1.72	ft
Discharge	152	cfs
Water Surface Elevation	5,000.52	ft
Channel Depth	2.73	ft
Channel Width	375.57	ft
Flow Area	112.8	sq.ft.
Wetted Perimeter	200.49	ft
Top Width	198	ft
Hydraulic Depth	0.57	ft
Hydraulic Radius	0.563	ft
Critical Depth	1.16	ft
Critical Slope	3.14842	%
Velocity	1.35	ft/s
Velocity Head	0.03	ft
Specific Energy	1.75	ft
Froude Number	0.315	
Velocity Depth Product	2.32	sq.ft./s
Flow Type	Sub-Critical	

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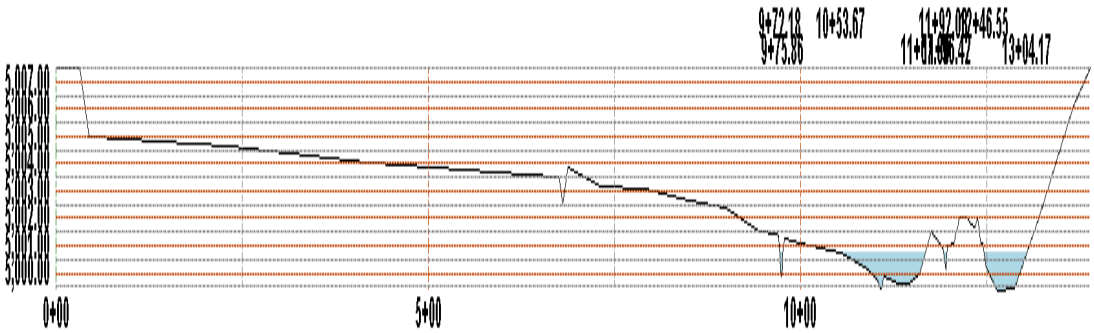
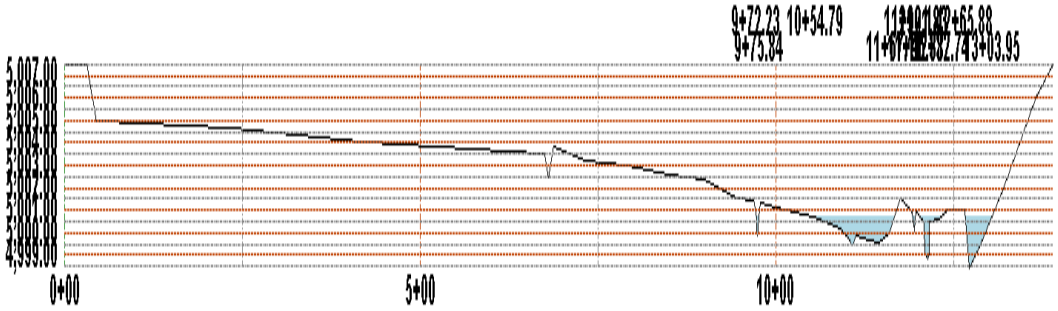
MOORES CREEK - SECTION "A" - EXISTING (100 YEAR FLOW - 408 CFS)



MOORES CREEK - SECTION "A" - PROPOSED (100 YEAR FLOW - 408 CFS)



MOORES CREEK SECTION "A" - EXISTING
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0444	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	1.39	ft
Discharge	408	cfs
Water Surface Elevation	5,000.74	ft
Channel Depth	8.15	ft
Channel Width	1,389.19	ft
Flow Area	144.26	sq.ft.
Wetted Perimeter	180.29	ft
Top Width	179.32	ft
Hydraulic Depth	0.804	ft
Hydraulic Radius	0.8	ft
Critical Depth	1.06	ft
Critical Slope	3.32999	%
Velocity	2.83	ft/s
Velocity Head	0.12	ft
Specific Energy	1.51	ft
Froude Number	0.556	
Velocity Depth Product	3.93	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "A" - PROPOSED
100 YEAR FLOW (408 CFS)

Description	Value	Units
Description	Value	Units
Manning's Equation		
Manning N Value	0.0437	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	2.3	ft
Discharge	408	cfs
Water Surface Elevation	5,000.72	ft
	9.08	ft
Channel Width	1,389.19	ft
Flow Area	146.73	sq.ft.
Wetted Perimeter	192.32	ft
Top Width	189.17	ft
Hydraulic Depth	0.776	ft
Hydraulic Radius	0.763	ft
Critical Depth	1.92	ft
Critical Slope	3.08433	%
Velocity	2.78	ft/s
Velocity Head	0.12	ft
Specific Energy	2.42	ft
Froude Number	0.557	
Velocity Depth Product	6.4	sq.ft./s
Flow Type	Sub-Critical	

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "B" @ 8+75)
SLOPE = 0.75%

Station	Elevation	Value	Comments
0+00.00	5,011.00	0.012	ROAD
0+30.53	5,011.00	0.012	ROAD
0+48.91	5,007.50	0.035	TALL GRASS
3+70.95	5,006.47	0.035	
3+84.63	5,006.17	0.035	
3+97.23	5,006.06	0.035	
4+15.96	5,006.46	0.035	
4+71.22	5,006.95	0.035	
6+01.68	5,007.58	0.035	
6+10.02	5,005.76	0.035	DITCH
6+16.48	5,007.22	0.035	
6+43.42	5,007.13	0.035	
6+60.60	5,007.03	0.035	
7+05.50	5,006.84	0.035	
7+37.74	5,006.77	0.035	
7+77.91	5,005.51	0.035	
7+97.07	5,005.06	0.035	
8+00.83	5,004.52	0.035	
8+02.03	5,004.25	0.035	DITCH
8+04.36	5,004.24	0.035	DITCH
8+09.75	5,004.38	0.035	
8+10.11	5,004.60	0.035	
8+12.57	5,005.00	0.035	
8+17.86	5,005.82	0.035	
8+38.11	5,005.85	0.035	
8+39.31	5,005.13	0.035	
8+42.30	5,005.90	0.035	
8+48.38	5,005.94	0.035	TALL GRASS
8+48.91	5,006.02	0.100	DENSE BRUSH
9+00.64	5,005.30	0.040	XSTG. CH
9+05.85	5,004.50	0.040	XSTG. CH.
9+12.37	5,005.00	0.040	XSTG. CH.
9+24.00	5,005.35	0.100	DENSE BRUSH
9+52.17	5,005.44	0.035	TALL GRASS
9+87.46	5,003.85	0.035	TALL GRASS
10+01.74	5,003.92	0.035	TALL GRASS
10+10.91	5,005.41	0.035	
10+15.34	5,005.34	0.012	DRIVEWAY
10+30.27	5,005.34	0.012	DRIVEWAY
10+34.12	5,004.91	0.035	GRASS
10+35.96	5,004.25	0.035	
10+40.42	5,003.55	0.035	
10+66.56	5,012.98	0.035	TALL GRASS
10+74.45	5,013.80	0.035	CANAL
11+00.14	5,014.53	0.035	CANAL

LYONS - MOORES CREEK - PROPOSED
(X-SECTION "B" @ 9+60)
SLOPE = 0.57%
NEW ALIGNMENT: POOL - TYPICAL

Station	Elevation	Value	Comments
0+00.00	5,011.00	0.012	ROAD
0+30.53	5,011.00	0.012	ROAD
0+48.91	5,007.50	0.035	TALL GRASS
3+70.95	5,006.47	0.035	
3+84.63	5,006.17	0.035	
3+97.23	5,006.06	0.035	
4+15.96	5,006.46	0.035	
4+71.22	5,006.95	0.035	
6+01.68	5,007.58	0.035	
6+10.02	5,005.76	0.035	DITCH
6+16.48	5,007.22	0.035	
6+43.42	5,007.13	0.035	
6+60.60	5,007.03	0.035	
7+05.50	5,006.84	0.035	
7+37.74	5,006.77	0.035	
7+77.91	5,005.51	0.035	
7+97.07	5,005.06	0.035	
8+00.83	5,004.52	0.035	
8+02.03	5,004.25	0.035	DITCH
8+04.36	5,004.24	0.035	DITCH
8+09.75	5,004.38	0.035	
8+10.11	5,004.60	0.035	
8+12.57	5,005.00	0.035	
8+17.86	5,005.82	0.035	
8+38.11	5,005.85	0.035	
8+39.31	5,005.13	0.035	
8+42.30	5,005.90	0.035	
8+48.38	5,005.94	0.035	
8+48.91	5,006.02	0.100	DENSE BRUSH
9+00.64	5,005.30	0.040	ORIG. CH
9+05.85	5,004.50	0.040	ORIG. CH
9+12.37	5,005.00	0.040	ORIG. CH
9+24.00	5,005.35	0.100	DENSE BRUSH
9+30.85	5,005.40	0.035	MATCH XSTG
9+51.08	5,004.20	0.035	BENCH
9+82.50	5,004.10	0.035	TOB
9+83.40	5,002.90	0.040	EOW
9+88.64	5,002.40	0.040	TLWG
9+90.11	5,002.90	0.040	EOW
9+91.00	5,003.85	0.035	TOB
9+94.24	5,003.90	0.035	BENCH
10+00.50	5,003.90	0.035	EXISTING
10+10.91	5,005.31	0.035	
10+15.34	5,005.34	0.012	DRIVEWAY
10+30.27	5,005.34	0.012	DRIVEWAY
10+34.12	5,004.91	0.035	GRASS
10+35.96	5,004.25	0.035	
10+40.42	5,003.55	0.035	
10+66.56	5,012.98	0.035	TALL GRASS
10+74.45	5,013.80	0.035	CANAL
11+00.14	5,014.53	0.035	CANAL

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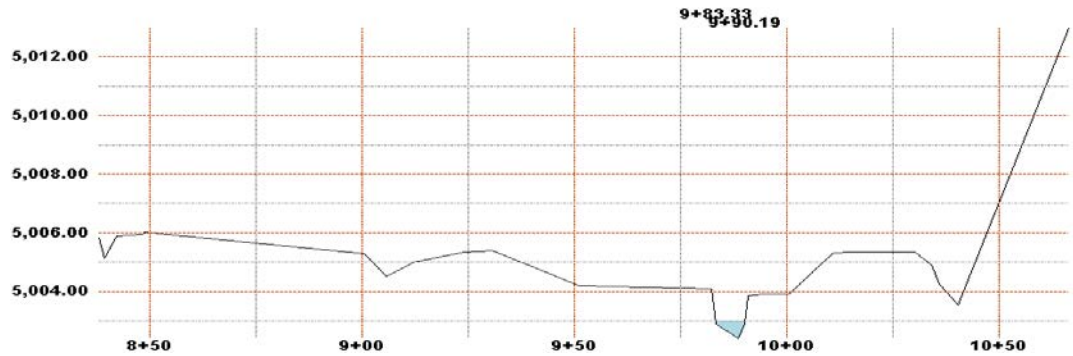
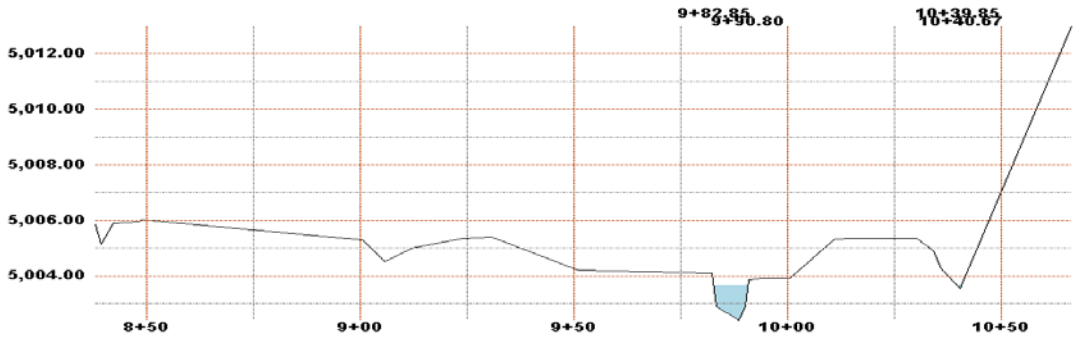
MOORES CREEK - SECTION "B" - PROPOSED (BASE FLOW - 3 CFS)



MOORES CREEK - SECTION "B" - PROPOSED (OHW FLOW - 16.5 CFS)



MOORES CREEK SECTION "B" - PROPOSED
BASE FLOW (3 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.04	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	0.59	ft
Discharge	3	cfs
Water Surface Elevation	5,002.99	ft
Channel Depth	3.45	ft
Channel Width	228.45	ft
Flow Area	2.27	sq.ft.
Wetted Perimeter	7.05	ft
Top Width	6.86	ft
Hydraulic Depth	0.331	ft
Hydraulic Radius	0.323	ft
Critical Depth	0.42	ft
Critical Slope	4.01919	%
Velocity	1.32	ft/s
Velocity Head	0.03	ft
Specific Energy	0.61	ft
Froude Number	0.404	
Velocity Depth Product	0.78	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "B" - PROPOSED
ORDINARY HIGH WATER (16.5 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0398	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	1.24	ft
Discharge	16.5	cfs
Water Surface Elevation	5,003.64	ft
Channel Depth	3.45	ft
Channel Width	228.45	ft
Flow Area	7.14	sq.ft.
Wetted Perimeter	9.59	ft
Top Width	8.77	ft
Hydraulic Depth	0.813	ft
Hydraulic Radius	0.744	ft
Critical Depth	0.82	ft
Critical Slope	3.06602	%
Velocity	2.31	ft/s
Velocity Head	0.08	ft
Specific Energy	1.32	ft
Froude Number	0.452	
Velocity Depth Product	2.87	sq.ft./s
Flow Type	Sub-Critical	

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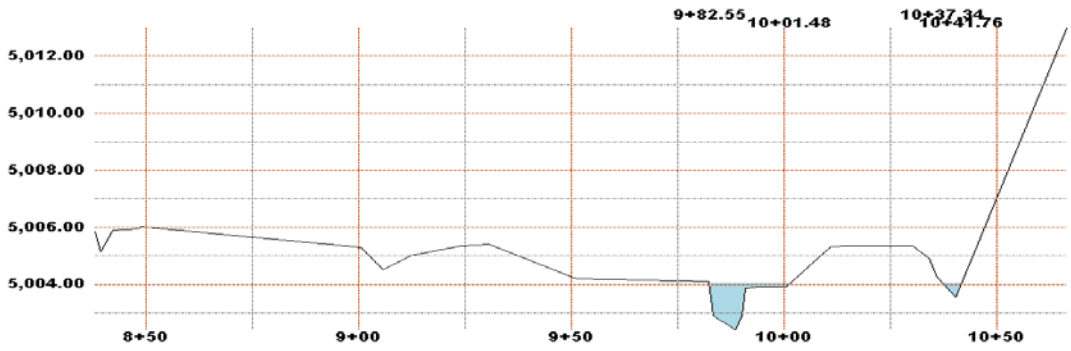
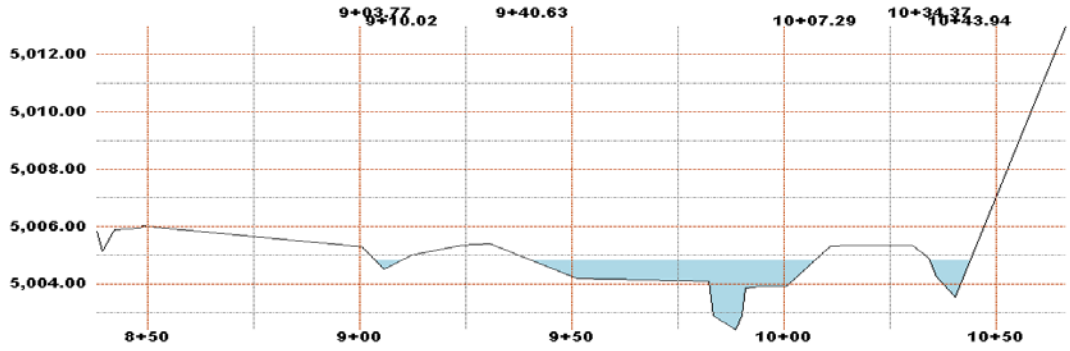
MOORES CREEK - SECTION "B" - PROPOSED (BANKFULL - 23.5 CFS)



MOORES CREEK - SECTION "B" - PROPOSED (10 YR FLOW - 152 CFS)



MOORES CREEK SECTION "B" - PROPOSED
BANKFULL (42 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0388	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	1.63	ft
Discharge	24	cfs
Water Surface Elevation	5,004.03	ft
Channel Depth	3.45	ft
Channel Width	228.45	ft
Flow Area	12.82	sq.ft.
Wetted Perimeter	24.56	ft
Top Width	23.35	ft
Hydraulic Depth	0.549	ft
Hydraulic Radius	0.522	ft
Critical Depth	0.98	ft
Critical Slope	2.90287	%
Velocity	1.87	ft/s
Velocity Head	0.05	ft
Specific Energy	1.69	ft
Froude Number	0.445	
Velocity Depth Product	3.06	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "B" - PROPOSED
10 YEAR (152 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0364	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	2.42	ft
Discharge	152	cfs
Water Surface Elevation	5,004.82	ft
Channel Depth	3.45	ft
Channel Width	228.45	ft
Flow Area	61.03	sq.ft.
Wetted Perimeter	84.08	ft
Top Width	82.47	ft
Hydraulic Depth	0.74	ft
Hydraulic Radius	0.726	ft
Critical Depth	2.09	ft
Critical Slope	2.48752	%
Velocity	2.49	ft/s
Velocity Head	0.1	ft
Specific Energy	2.52	ft
Froude Number	0.51	
Velocity Depth Product	6.03	sq.ft./s
Flow Type	Sub-Critical	

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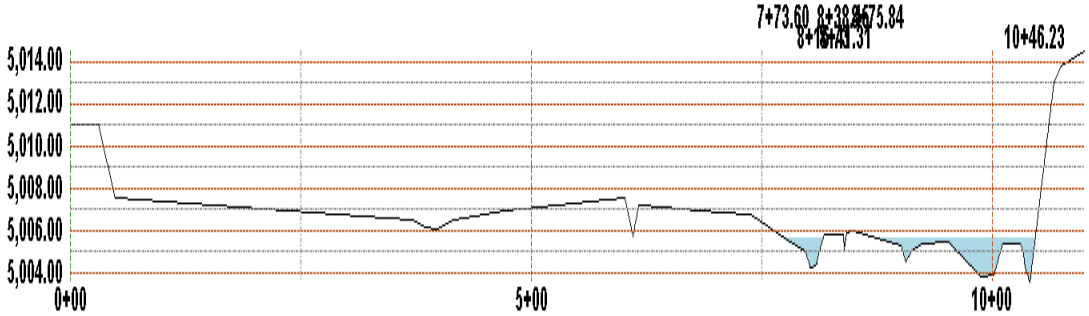
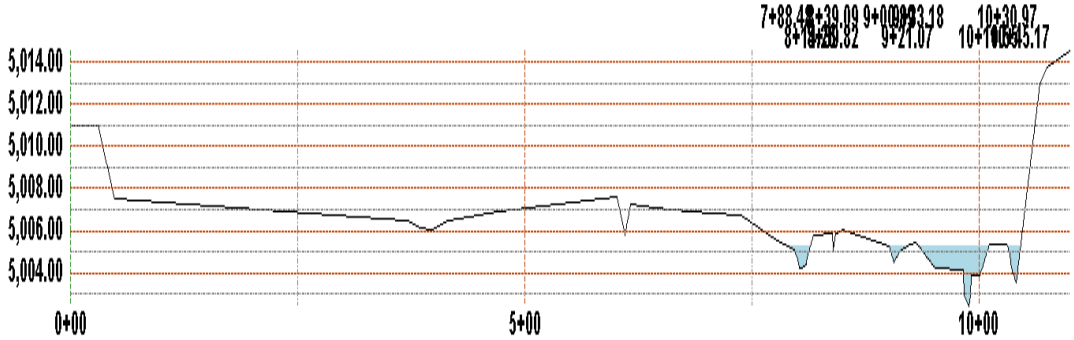
MOORES CREEK - SECTION "B" - EXISTING (100 YEAR FLOW - 408 CFS)



MOORES CREEK - SECTION "B" - PROPOSED (100 YEAR FLOW - 408 CFS)



MOORES CREEK SECTION "B" - EXISTING
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.037	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	2.98	ft
Discharge	408	cfs
Water Surface Elevation	5,005.38	ft
Channel Depth	8.6	ft
Channel Width	1,100.14	ft
Flow Area	129.71	sq.ft.
Wetted Perimeter	181.16	ft
Top Width	178.85	ft
Hydraulic Depth	0.725	ft
Hydraulic Radius	0.716	ft
Critical Depth	2.62	ft
Critical Slope	2.14283	%
Velocity	3.15	ft/s
Velocity Head	0.15	ft
Specific Energy	3.14	ft
Froude Number	0.651	
Velocity Depth Product	9.38	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "B" - PROPOSED
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0366	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	2.86	ft
Discharge	408	cfs
Water Surface Elevation	5,005.26	ft
Channel Depth	8.60	ft
Channel Width	1,100.14	ft
Flow Area	116.28	sq.ft.
Wetted Perimeter	140.32	ft
Top Width	138.26	ft
Hydraulic Depth	0.841	ft
Hydraulic Radius	0.829	ft
Critical Depth	2.57	ft
Critical Slope	2.12334	%
Velocity	3.51	ft/s
Velocity Head	0.19	ft
Specific Energy	3.05	ft
Froude Number	0.675	
Velocity Depth Product	10.04	sq.ft./s
Flow Type	Sub-Critical	

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "C" @ 11+70)

SLOPE = 0.64%

Station	Elevation	Value	Comments
0+00.00	5,013.00	0.012	ROAD
0+24.02	5,013.00	0.012	ROAD
0+41.79	5,008.30	0.035	TALL GRASS
1+20.19	5,008.63	0.035	
2+50.14	5,008.91	0.035	
3+09.59	5,009.30	0.035	
4+05.82	5,007.92	0.035	
3+09.59	5,007.57	0.035	
4+86.44	5,008.50	0.035	
5+49.99	5,008.94	0.035	
5+68.38	5,009.06	0.035	
5+72.04	5,007.54	0.035	DITCH
5+74.44	5,007.48	0.035	
5+75.63	5,007.52	0.035	DITCH
5+82.11	5,008.66	0.035	
6+06.99	5,008.60	0.035	
6+09.87	5,007.52	0.035	
6+11.99	5,007.50	0.035	
6+16.15	5,008.63	0.035	
6+46.54	5,007.34	0.035	
6+52.49	5,007.10	0.035	
6+58.00	5,008.04	0.035	TALL GRASS
6+70.00	5,008.00	0.035	DITCH
6+72.29	5,006.40	0.035	DITCH
6+77.29	5,008.00	0.050	TREES
7+03.39	5,007.67	0.035	XSTG. CH
7+03.85	5,006.96	0.035	
7+03.99	5,006.52	0.035	
7+07.00	5,006.55	0.035	
7+08.51	5,007.10	0.012	
7+08.74	5,007.60	0.035	XSTG. CH
7+10.57	5,007.88	0.050	TREES
7+20.54	5,008.21	0.035	TALL GRASS
7+27.10	5,008.26	0.035	
7+36.85	5,008.33	0.035	
7+52.91	5,007.92	0.035	
7+59.17	5,007.80	0.035	TALL GRASS
8+04.18	5,008.08	0.012	DRIVEWAY
8+30.86	5,008.46	0.012	DRIVEWAY
8+53.97	5,009.58	0.030	SHORT GRASS
9+26.72	5,008.79	0.030	SHORT GRASS
9+64.81	5,005.77	0.035	TALL GRASS
9+81.24	5,006.49	0.035	
9+99.38	5,006.02	0.035	
10+21.51	5,013.89	0.035	
10+28.37	5,013.72	0.035	TALL GRASS
10+35.83	5,010.28	0.035	TALL GRASS
10+37.85	5,008.14	0.035	CANAL
10+49.51	5,008.78	0.035	CANAL
10+52.09	5,013.78	0.035	CANAL
10+59.83	5,018.75	0.035	TALL GRASS
10+88.34	5,025.61	0.035	TALL GRASS

LYONS - MOORES CREEK: PROPOSED
(X-SECTION "C" @ 12+85)
NEW ALIGNMENT: RIFFLE - TYPICAL

SLOPE = 1.11%

Station	Elevation	Value	Comments
0+00.00	5,013.00	0.012	ROAD
0+24.02	5,013.00	0.012	ROAD
0+41.79	5,008.30	0.035	TALL GRASS
1+20.19	5,008.63	0.035	
2+50.14	5,008.91	0.035	
3+09.59	5,009.30	0.035	
4+05.82	5,007.92	0.035	
4+25.39	5,007.57	0.035	
4+86.44	5,008.50	0.035	
5+49.99	5,008.94	0.035	
5+68.38	5,009.06	0.035	
5+72.04	5,007.54	0.035	DITCH
5+74.44	5,007.48	0.035	
5+75.63	5,007.52	0.035	DITCH
5+82.11	5,008.66	0.035	
6+06.99	5,008.60	0.035	
6+09.87	5,007.52	0.035	
6+11.99	5,007.50	0.035	
6+16.15	5,008.63	0.035	
6+46.54	5,007.34	0.035	
6+52.49	5,007.10	0.035	
6+58.00	5,008.04	0.035	TALL GRASS
6+70.00	5,008.00	0.035	DITCH
6+72.29	5,006.40	0.035	DITCH
6+77.29	5,008.00	0.050	TREES
7+03.39	5,007.67	0.035	ORIG. CH
7+03.85	5,006.96	0.035	
7+03.99	5,006.52	0.035	
7+07.00	5,006.55	0.035	
7+08.51	5,007.10	0.012	
7+08.74	5,007.60	0.035	ORIG. CH
7+10.57	5,007.88	0.050	TREES
7+20.54	5,008.21	0.035	TALL GRASS
7+35.97	5,008.00	0.035	MATCH XSTG.
7+62.64	5,007.00	0.035	BENCH
7+67.51	5,006.90	0.035	TOB
7+68.00	5,005.80	0.035	EOW
7+72.82	5,005.30	0.035	TLWG
7+75.00	5,005.80	0.035	EOW
7+75.82	5,006.90	0.035	TOB
7+79.56	5,007.00	0.035	BENCH
7+92.05	5,007.80	0.035	EXISTING
8+04.18	5,008.08	0.012	DRIVEWAY
8+30.86	5,008.46	0.012	DRIVEWAY
8+53.97	5,009.58	0.030	SHORT GRASS
9+26.72	5,008.79	0.030	SHORT GRASS
9+64.81	5,005.77	0.035	TALL GRASS
9+81.24	5,006.49	0.035	
9+99.38	5,006.02	0.035	
10+21.51	5,013.89	0.035	
10+28.37	5,013.72	0.035	TALL GRASS
10+35.83	5,010.28	0.035	TALL GRASS
10+37.85	5,008.14	0.035	CANAL
10+49.51	5,008.78	0.035	CANAL
10+52.09	5,013.78	0.035	CANAL
10+59.83	5,018.75	0.035	TALL GRASS
10+88.34	5,025.61	0.035	TALL GRASS

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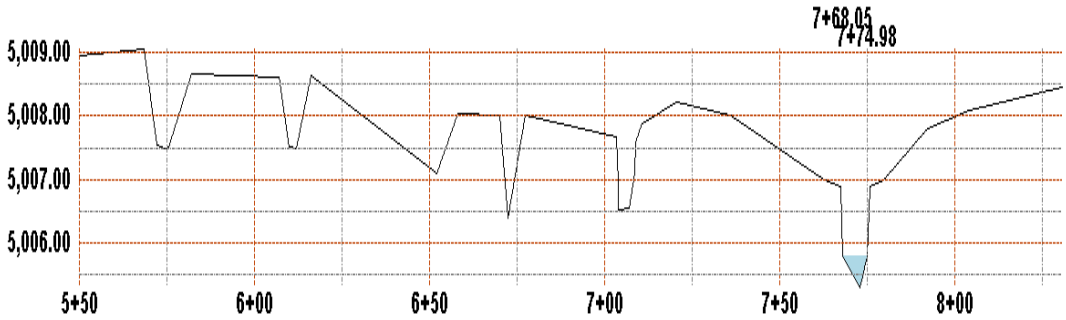
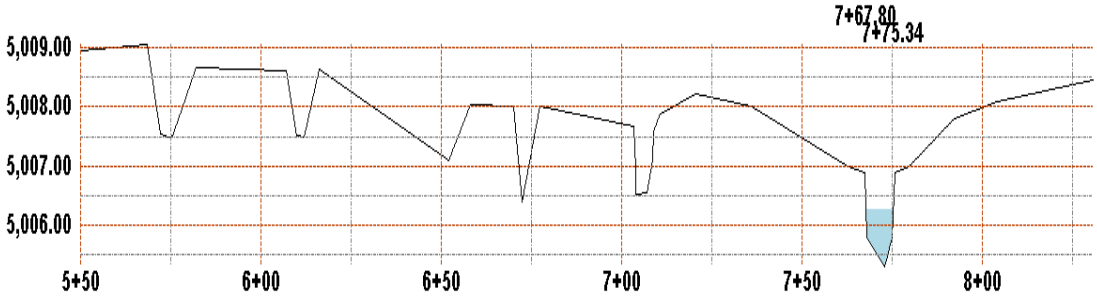
MOORES CREEK - SECTION "C" - PROPOSED (BASE FLOW - 3 CFS)



MOORES CREEK - SECTION "C" - PROPOSED (OHW FLOW - 16.5 CFS)



MOORES CREEK SECTION "C" - PROPOSED
BASE FLOW (3 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	1.11	%
Normal Depth	0.49	ft
Discharge	3	cfs
Water Surface Elevation	5,005.79	ft
Channel Depth	3.16	ft
Channel Width	280.67	ft
Flow Area	1.71	sq.ft.
Wetted Perimeter	7.01	ft
Top Width	6.93	ft
Hydraulic Depth	0.247	ft
Hydraulic Radius	0.245	ft
Critical Depth	0.41	ft
Critical Slope	3.07817	%
Velocity	1.75	ft/s
Velocity Head	0.05	ft
Specific Energy	0.54	ft
Froude Number	0.62	
Velocity Depth Product	0.87	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "C" - PROPOSED
ORDINARY HIGH WATER (16.5 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	1.11	%
Normal Depth	0.96	ft
Discharge	16.5	cfs
Water Surface Elevation	5,006.26	ft
Channel Depth	3.16	ft
Channel Width	280.67	ft
Flow Area	5.07	sq.ft.
Wetted Perimeter	8.15	ft
Top Width	7.54	ft
Hydraulic Depth	0.672	ft
Hydraulic Radius	0.621	ft
Critical Depth	0.81	ft
Critical Slope	2.36993	%
Velocity	3.26	ft/s
Velocity Head	0.16	ft
Specific Energy	1.12	ft
Froude Number	0.701	
Velocity Depth Product	3.11	sq.ft./s
Flow Type	Sub-Critical	

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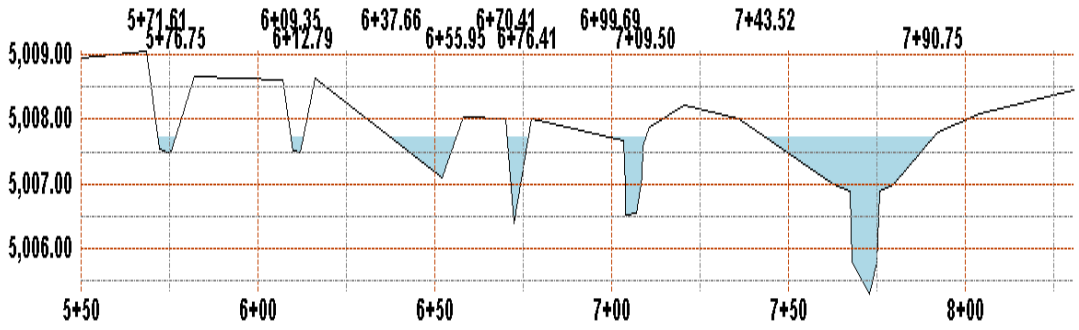
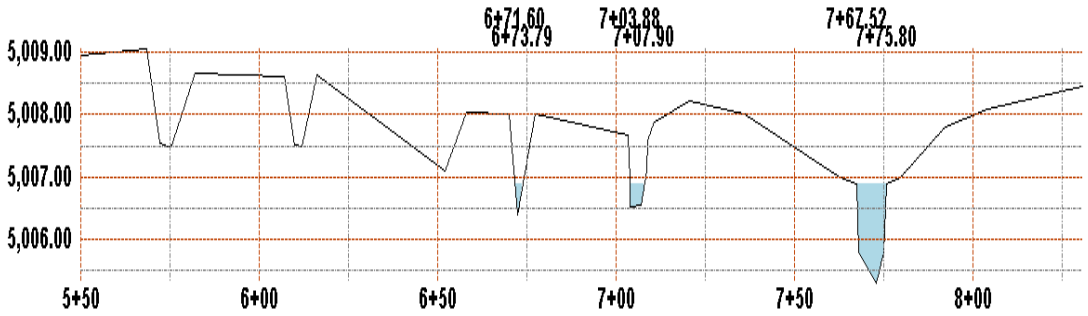
MOORES CREEK - SECTION "C" - PROPOSED (BANKFULL - 42 CFS)



MOORES CREEK - SECTION "C" - PROPOSED (10 YR FLOW - 152 CFS)



MOORES CREEK SECTION "C" - PROPOSED
BANKFULL (42 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	1.11	%
Normal Depth	1.58	ft
Discharge	42	cfs
Water Surface Elevation	5,006.88	ft
Channel Depth	3.16	ft
Channel Width	280.67	ft
Flow Area	11.73	sq.ft.
Wetted Perimeter	16.37	ft
Top Width	14.5	ft
Hydraulic Depth	0.809	ft
Hydraulic Radius	0.716	ft
Critical Depth	1.37	ft
Critical Slope	2.29779	%
Velocity	3.58	ft/s
Velocity Head	0.2	ft
Specific Energy	1.78	ft
Froude Number	0.702	
Velocity Depth Product	5.66	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "C" - PROPOSED
10 YEAR (152 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	1.11	%
Normal Depth	2.42	ft
Discharge	152	cfs
Water Surface Elevation	5,007.72	ft
Channel Depth	3.16	ft
Channel Width	280.67	ft
Flow Area	50.91	sq.ft.
Wetted Perimeter	93.23	ft
Top Width	89.91	ft
Hydraulic Depth	0.566	ft
Hydraulic Radius	0.546	ft
Critical Depth	2.23	ft
Critical Slope	2.32582	%
Velocity	2.99	ft/s
Velocity Head	0.14	ft
Specific Energy	2.56	ft
Froude Number	0.7	
Velocity Depth Product	7.22	sq.ft./s
Flow Type	Sub-Critical	

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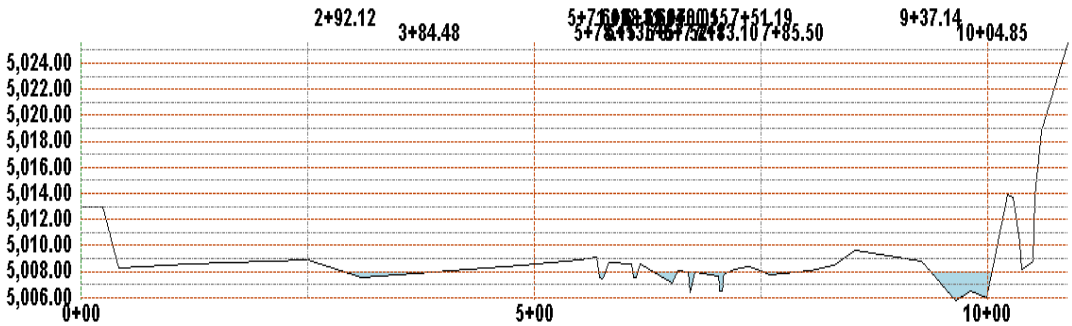
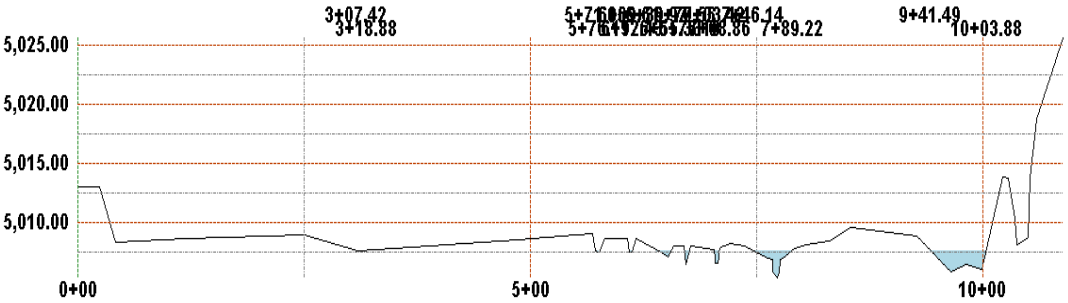
MOORES CREEK - SECTION "C" - EXISTING (100 YEAR FLOW - 408 CFS)



MOORES CREEK - SECTION "C" - PROPOSED (100 YEAR FLOW - 408 CFS)



MOORES CREEK SECTION "C" - EXISTING
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0354	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	2.19	ft
Discharge	408	cfs
Water Surface Elevation	5,007.96	ft
Channel Depth	7.23	ft
Channel Width	1,088.34	ft
Flow Area	149.04	sq.ft.
Wetted Perimeter	274.96	ft
Top Width	272.27	ft
Hydraulic Depth	0.547	ft
Hydraulic Radius	0.542	ft
Critical Depth	1.72	ft
Critical Slope	1.89511	%
Velocity	2.74	ft/s
Velocity Head	0.12	ft
Specific Energy	2.31	ft
Froude Number	0.652	
Velocity Depth Product	6.01	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "C" - PROPOSED
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	2.32	ft
Discharge	408	cfs
Water Surface Elevation	5,007.62	ft
Channel Depth	7.70	ft
Channel Width	1,088.34	ft
Flow Area	117.47	sq.ft.
Wetted Perimeter	153.98	ft
Top Width	150.44	ft
Hydraulic Depth	0.781	ft
Hydraulic Radius	0.763	ft
Critical Depth	2.02	ft
Critical Slope	2.00899	%
Velocity	3.47	ft/s
Velocity Head	0.19	ft
Specific Energy	2.51	ft
Froude Number	0.693	
Velocity Depth Product	8.05	sq.ft./s
Flow Type	Sub-Critical	

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "D" @ 13+50)

SLOPE = 0.45%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,014.50	0.012	ROAD
0+23.56	5,014.50	0.012	ROAD
0+54.81	5,010.33	0.035	TALL GRASS
1+25.79	5,010.66	0.035	
2+38.04	5,010.33	0.035	
3+62.45	5,011.08	0.035	
4+28.17	5,009.78	0.035	
4+97.03	5,009.24	0.035	
5+24.36	5,010.28	0.035	
5+46.03	5,009.09	0.035	
5+49.04	5,008.87	0.035	DITCH
5+51.06	5,008.90	0.035	DITCH
5+57.62	5,010.79	0.035	
5+62.46	5,010.29	0.035	
6+06.37	5,008.11	0.035	
6+15.60	5,008.65	0.035	
6+46.85	5,008.58	0.035	TALL GRASS
6+55.42	5,007.74	0.035	XSTG. CH
6+55.71	5,007.65	0.035	
6+63.92	5,007.50	0.035	
6+69.06	5,007.46	0.035	
6+69.53	5,007.76	0.035	XSTG. CH
6+72.61	5,008.54	0.035	TALL GRASS
6+82.77	5,009.51	0.035	
7+10.61	5,009.24	0.035	
7+28.80	5,009.38	0.035	TALL GRASS
7+64.82	5,009.34	0.012	DRIVEWAY
7+89.23	5,009.34	0.012	DRIVEWAY
8+16.73	5,008.93	0.035	TALL GRASS
8+75.83	5,008.47	0.050	TREES
9+83.41	5,013.43	0.050	TREES
9+89.59	5,015.16	0.050	TREES
9+93.14	5,015.36	0.050	TREES
10+03.56	5,010.57	0.035	CANAL
10+07.09	5,010.38	0.035	CANAL
10+10.09	5,008.19	0.035	CANAL
10+22.85	5,008.20	0.035	CANAL
10+24.38	5,012.00	0.035	CANAL
10+29.67	5,016.06	0.035	TALL GRASS
10+57.82	5,021.28	0.035	TALL GRASS

LYONS - MOORES CREEK - PROPOSED
(X-SECTION "D" - @ 15+00)
EXISTING ALIGNMENT: REGRADED REACH

SLOPE = 0.57%

Station	Elevation	Starting N-Value	Comments
0+00.00	5,014.50	0.012	ROAD
0+23.56	5,014.50	0.012	ROAD
0+54.81	5,010.33	0.035	TALL GRASS
1+25.79	5,010.66	0.035	
2+38.04	5,010.33	0.035	
3+62.45	5,011.08	0.035	
4+28.17	5,009.78	0.035	
4+97.03	5,009.24	0.035	
5+24.36	5,010.28	0.035	
5+46.03	5,009.09	0.035	
5+49.04	5,008.87	0.035	DITCH
5+51.06	5,008.90	0.035	DITCH
5+57.62	5,010.79	0.035	
5+62.46	5,010.29	0.035	
6+06.37	5,008.11	0.035	
6+15.60	5,008.65	0.035	
6+46.85	5,007.20	0.035	RE-GRADE
6+55.42	5,006.14	0.035	XSTG. CHANNEL
6+55.71	5,006.05	0.035	
6+63.92	5,005.90	0.035	
6+69.06	5,005.86	0.035	
6+69.53	5,006.16	0.035	XSTG, CHANNEL
6+72.61	5,007.20	0.035	RE-GRADE
6+82.77	5,008.50	0.035	RE-GRADE
7+10.61	5,009.24	0.035	
7+28.80	5,009.38	0.035	TALL GRASS
7+64.82	5,009.34	0.012	DRIVEWAY
7+89.23	5,009.34	0.012	DRIVEWAY
8+16.73	5,008.93	0.035	TALL GRASS
8+75.83	5,008.47	0.050	TREES
9+83.41	5,013.43	0.050	TREES
9+89.59	5,015.16	0.050	TREES
9+93.14	5,015.36	0.050	TREES
10+03.56	5,010.57	0.035	CANAL
10+07.09	5,010.38	0.035	CANAL
10+10.09	5,008.19	0.035	CANAL
10+22.85	5,008.20	0.035	CANAL
10+24.38	5,012.00	0.035	CANAL
10+29.67	5,016.06	0.035	TALL GRASS
10+57.82	5,021.28	0.035	TALL GRASS

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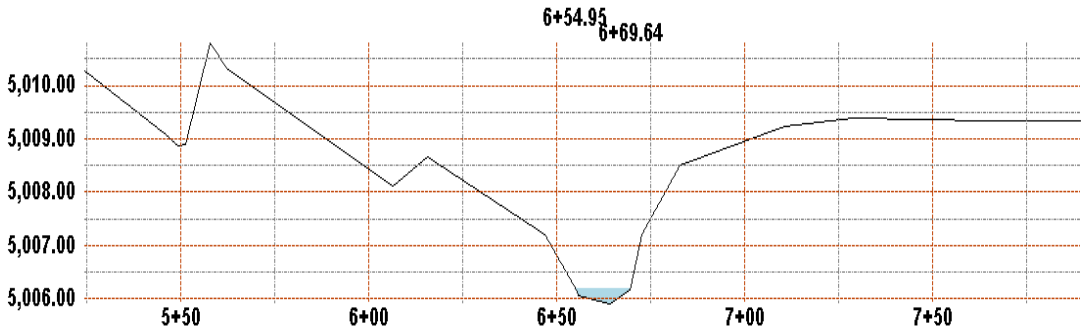
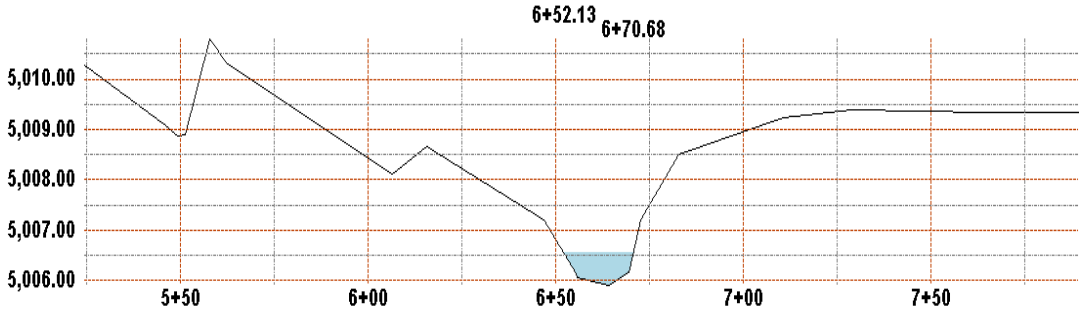
MOORES CREEK - SECTION "D" - PROPOSED (BASE FLOW - 3 CFS)



MOORES CREEK - SECTION "D" - PROPOSED (OHW FLOW - 16.5 CFS)



MOORES CREEK SECTION "D" - PROPOSED
BASE FLOW (3 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	0.3	ft
Discharge	3	cfs
Water Surface Elevation	5,006.20	ft
Channel Depth	3.44	ft
Channel Width	264.87	ft
Flow Area	2.82	sq.ft.
Wetted Perimeter	14.72	ft
Top Width	14.69	ft
Hydraulic Depth	0.192	ft
Hydraulic Radius	0.191	ft
Critical Depth	0.21	ft
Critical Slope	3.63059	%
Velocity	1.06	ft/s
Velocity Head	0.02	ft
Specific Energy	0.32	ft
Froude Number	0.429	
Velocity Depth Product	0.32	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "D" - PROPOSED
ORDINARY HIGH WATER (16.5 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	0.65	ft
Discharge	16.5	cfs
Water Surface Elevation	5,006.55	ft
Channel Depth	3.44	ft
Channel Width	264.87	ft
Flow Area	8.62	sq.ft.
Wetted Perimeter	18.65	ft
Top Width	18.54	ft
Hydraulic Depth	0.465	ft
Hydraulic Radius	0.462	ft
Critical Depth	0.45	ft
Critical Slope	2.63432	%
Velocity	1.92	ft/s
Velocity Head	0.06	ft
Specific Energy	0.7	ft
Froude Number	0.495	
Velocity Depth Product	1.24	sq.ft./s
Flow Type	Sub-Critical	

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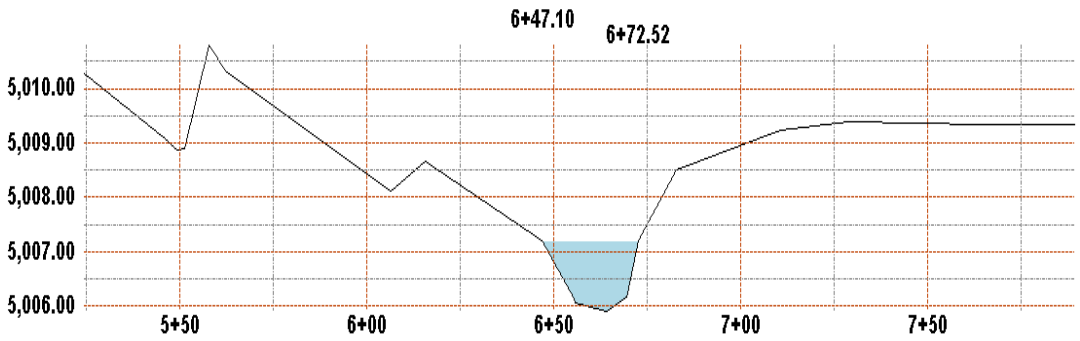
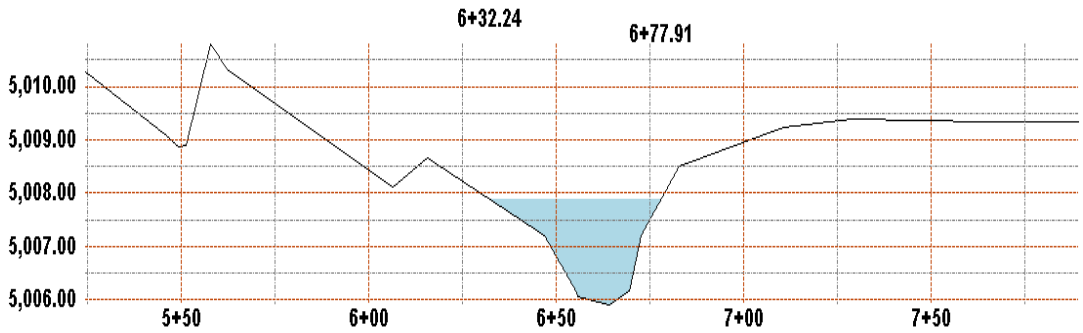
MOORES CREEK - SECTION "D" - PROPOSED (BANKFULL - 65 CFS)



MOORES CREEK - SECTION "D" - PROPOSED (10 YR FLOW - 152 CFS)



MOORES CREEK SECTION "D" - PROPOSED
BANKFULL (65 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.035	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	1.27	ft
Discharge	65	cfs
Water Surface Elevation	5,007.17	ft
Channel Depth	3.44	ft
Channel Width	264.87	ft
Flow Area	22.28	sq.ft.
Wetted Perimeter	25.66	ft
Top Width	25.41	ft
Hydraulic Depth	0.877	ft
Hydraulic Radius	0.868	ft
Critical Depth	0.92	ft
Critical Slope	2.07678	%
Velocity	2.92	ft/s
Velocity Head	0.13	ft
Specific Energy	1.4	ft
Froude Number	0.549	
Velocity Depth Product	3.7	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "D" - PROPOSED
10 YEAR (152 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0356	
Manning N Method	Cox/USACE	
Channel Slope	0.57	%
Normal Depth	1.98	ft
Discharge	152	cfs
Water Surface Elevation	5,007.88	ft
Channel Depth	3.44	ft
Channel Width	264.87	ft
Flow Area	47.3	sq.ft.
Wetted Perimeter	45.99	ft
Top Width	45.67	ft
Hydraulic Depth	1.036	ft
Hydraulic Radius	1.029	ft
Critical Depth	1.48	ft
Critical Slope	1.87215	%
Velocity	3.21	ft/s
Velocity Head	0.16	ft
Specific Energy	2.14	ft
Froude Number	0.557	
Velocity Depth Product	6.36	sq.ft./s
Flow Type	Sub-Critical	

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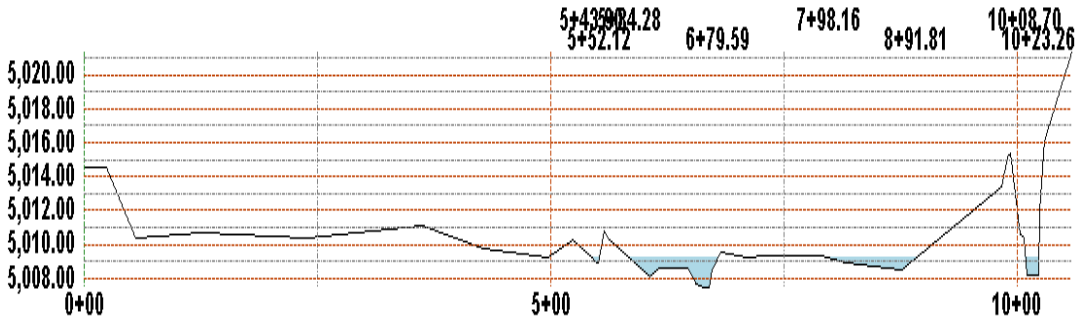
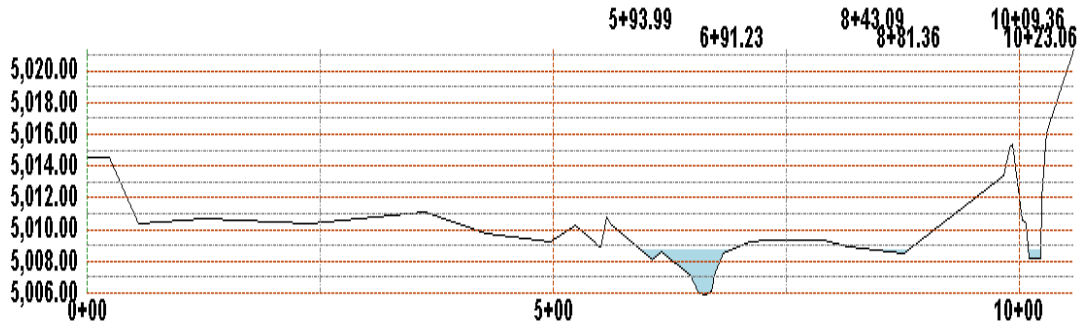
MOORES CREEK - SECTION "D" - EXISTING (100 YEAR FLOW - 408 CFS)



MOORES CREEK - SECTION "D" - PROPOSED (100 YEAR FLOW - 408 CFS)



MOORES CREEK SECTION "D" - EXISTING
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0336	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	1.75	ft
Discharge	408	cfs
Water Surface Elevation	5,009.21	ft
Channel Depth	7.04	ft
Channel Width	1,057.82	ft
Flow Area	130.64	sq.ft.
Wetted Perimeter	213.15	ft
Top Width	211.75	ft
Hydraulic Depth	0.617	ft
Hydraulic Radius	0.613	ft
Critical Depth	1.59	ft
Critical Slope	2.00889	%
Velocity	3.12	ft/s
Velocity Head	0.15	ft
Specific Energy	1.9	ft
Froude Number	0.701	
Velocity Depth Product	5.46	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "D" - PROPOSED
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0349	
Manning N Method	Cox/USACE	
Channel Slope	0.96	%
Normal Depth	2.82	ft
Discharge	408	cfs
Water Surface Elevation	5,008.72	ft
Channel Depth	8.60	ft
Channel Width	1,057.82	ft
Flow Area	116.08	sq.ft.
Wetted Perimeter	150.16	ft
Top Width	149.22	ft
Hydraulic Depth	0.778	ft
Hydraulic Radius	0.773	ft
Critical Depth	2.45	ft
Critical Slope	1.89591	%
Velocity	3.51	ft/s
Velocity Head	0.19	ft
Specific Energy	3.02	ft
Froude Number	0.703	
Velocity Depth Product	9.93	sq.ft./s
Flow Type	Sub-Critical	

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LYONS - MOORES CREEK - EXISTING
(X-SECTION "E" - REF. NO.1 @ 20+50)

SLOPE = 0.58%

Station	Elevation	Value	Comments
0+00.00	5,018.30	0.012	ROAD
0+33.95	5,018.30	0.012	ROAD
0+81.40	5,014.84	0.035	TALL GRASS
0+96.24	5,013.80	0.035	
1+09.01	5,014.80	0.035	
1+39.71	5,015.15	0.035	
1+44.50	5,015.22	0.035	
1+67.56	5,016.01	0.035	
2+19.24	5,016.49	0.035	
2+50.32	5,016.43	0.035	
2+62.83	5,016.29	0.035	
2+74.21	5,016.54	0.035	
3+04.81	5,016.32	0.035	TALL GRASS
3+16.00	5,014.02	0.035	CANAL
3+17.34	5,011.32	0.035	CANAL
3+28.12	5,011.28	0.035	CANAL
3+39.30	5,012.32	0.035	CANAL
3+40.50	5,013.52	0.035	CANAL
3+51.94	5,017.26	0.035	TALL GRASS
3+58.37	5,017.15	0.035	
3+61.66	5,016.18	0.035	
3+68.87	5,016.08	0.035	
3+90.59	5,015.70	0.035	
4+29.29	5,015.55	0.035	TALL GRASS
4+67.18	5,015.54	0.100	DENSE BRUSH
4+89.15	5,011.47	0.040	XSTG. CH
4+89.60	5,011.23	0.040	XSTG. CH
4+94.20	5,010.91	0.040	XSTG. CH
4+96.72	5,011.20	0.040	XSTG. CH
4+97.23	5,011.59	0.040	XSTG. CH
5+03.76	5,015.10	0.100	DENSE BRUSH
5+13.99	5,015.06	0.100	DENSE BRUSH
5+26.11	5,015.45	0.100	DENSE BRUSH
5+39.93	5,018.66	0.035	TALL GRASS
5+62.39	5,021.69	0.035	
5+68.55	5,022.60	0.035	
5+72.15	5,023.60	0.035	
6+13.00	5,024.48	0.035	
6+30.92	5,027.19	0.035	
6+44.61	5,033.48	0.035	
6+62.06	5,034.68	0.035	
6+86.81	5,042.08	0.035	TALL GRASS

LYONS - MOORES CREEK - EXISTING
(X-SECTION "F" - REF. NO.2 @ 23+50)

SLOPE = 1.42%

Station	Elevation	Value	Comments
0+00.00	5,021.00	0.012	ROAD
0+28.26	5,021.00	0.012	ROAD
0+40.09	5,018.61	0.035	TALL GRASS
0+76.20	5,018.33	0.035	
1+11.36	5,017.38	0.035	
1+24.03	5,019.34	0.035	
1+31.32	5,019.30	0.035	
1+43.66	5,018.29	0.035	
1+87.72	5,018.53	0.035	
2+19.10	5,019.90	0.035	TALL GRASS
2+51.11	5,019.66	0.100	DENSE BRUSH
2+68.58	5,017.61	0.100	DENSE BRUSH
2+82.69	5,018.12	0.100	DENSE BRUSH
2+90.27	5,015.23	0.040	XSTG. CH
2+90.76	5,014.86	0.040	XSTG. CH
2+94.36	5,014.64	0.040	XSTG. CH
2+96.65	5,014.94	0.040	XSTG. CH
2+97.14	5,015.46	0.040	XSTG. CH
3+01.68	5,018.63	0.100	DENSE BRUSH
3+21.65	5,018.58	0.100	DENSE BRUSH
3+33.32	5,019.76	0.100	DENSE BRUSH
3+41.90	5,021.86	0.035	TALL GRASS
3+63.31	5,025.43	0.035	
3+75.77	5,026.98	0.035	
4+04.92	5,032.11	0.035	
4+15.44	5,032.97	0.035	
4+23.47	5,032.80	0.035	
4+76.73	5,041.65	0.035	
5+26.00	5,053.27	0.035	TALL GRASS

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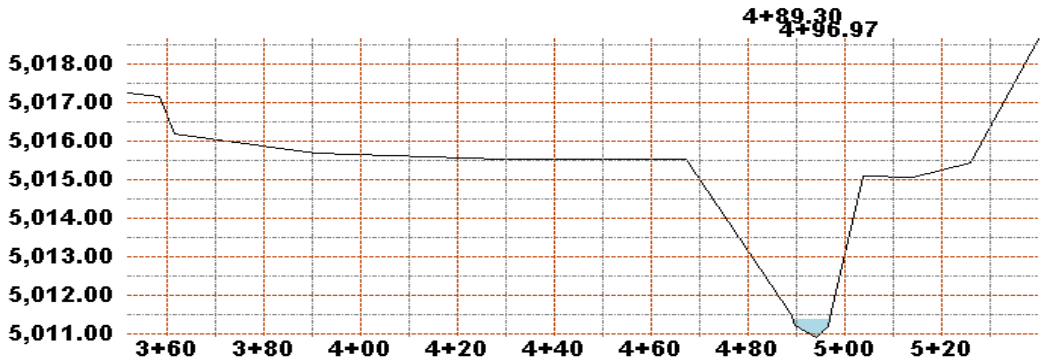
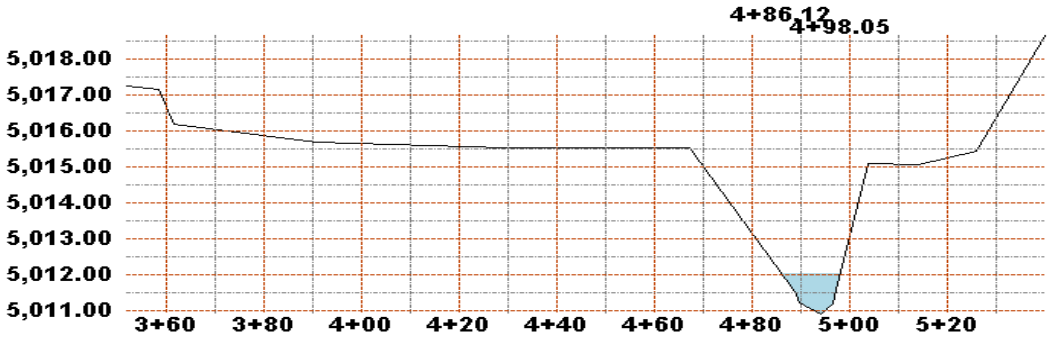
MOORES CREEK - SECTION "E" - REFERENCE REACH (BASE FLOW - 3 CFS)



MOORES CREEK - SECTION "E" - REFERENCE REACH (OHW FLOW - 16.5 CFS)



MOORES CREEK SECTION "E" - REF. REACH
BASE FLOW (3 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.04	
Manning N Method	Cox/USACE	
Channel Slope	0.58	%
Normal Depth	0.48	ft
Discharge	3	cfs
Water Surface Elevation	5,011.39	ft
Channel Depth	6.35	ft
Channel Width	187.99	ft
Flow Area	2.35	sq.ft.
Wetted Perimeter	7.8	ft
Top Width	7.66	ft
Hydraulic Depth	0.307	ft
Hydraulic Radius	0.302	ft
Critical Depth	0.33	ft
Critical Slope	4.19912	%
Velocity	1.27	ft/s
Velocity Head	0.03	ft
Specific Energy	0.5	ft
Froude Number	0.405	
Velocity Depth Product	0.61	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "E" - REF. REACH
ORDINARY HIGH WATER (16.5 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.046	
Manning N Method	Cox/USACE	
Channel Slope	0.58	%
Normal Depth	1.12	ft
Discharge	16.5	cfs
Water Surface Elevation	5,012.03	ft
Channel Depth	6.35	ft
Channel Width	187.99	ft
Flow Area	8.55	sq.ft.
Wetted Perimeter	12.32	ft
Top Width	11.93	ft
Hydraulic Depth	0.716	ft
Hydraulic Radius	0.694	ft
Critical Depth	0.71	ft
Critical Slope	3.22897	%
Velocity	1.93	ft/s
Velocity Head	0.06	ft
Specific Energy	1.18	ft
Froude Number	0.402	
Velocity Depth Product	2.16	sq.ft./s
Flow Type	Sub-Critical	

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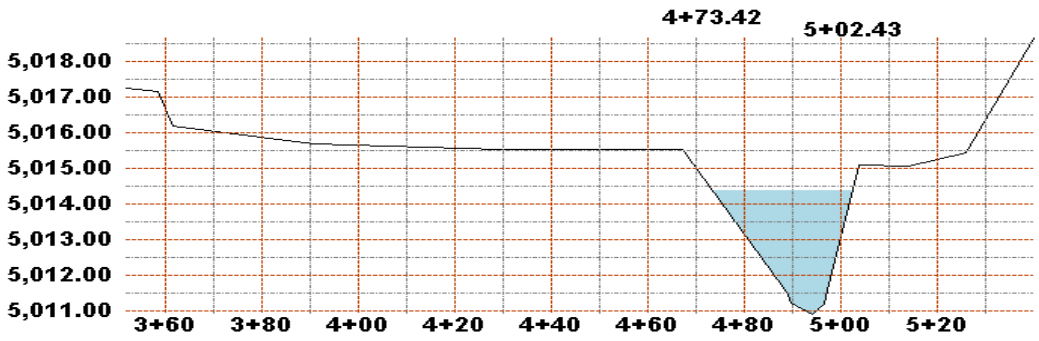
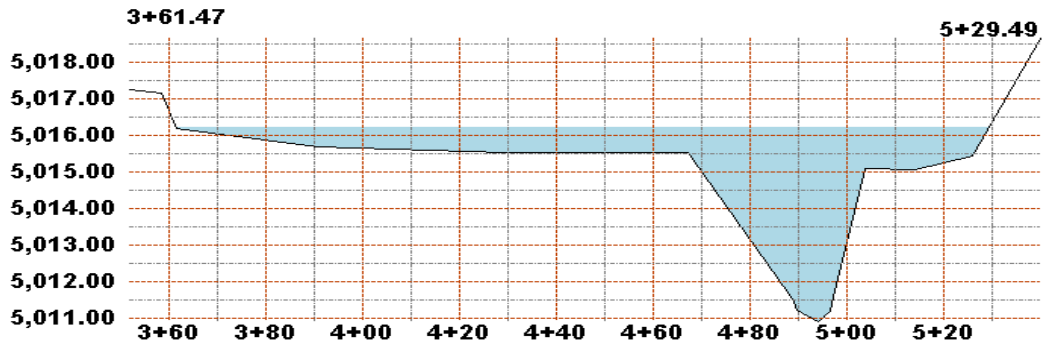
MOORES CREEK - SECTION "E" - REFERENCE REACH (10 YEAR - 152 CFS)



MOORES CREEK - SECTION "E" - REFERENCE REACH (100 YR FLOW - 408 CFS)



MOORES CREEK SECTION "E" - REF. REACH
10 YEAR (152 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0643	
Manning N Method	Cox/USACE	
Channel Slope	0.58	%
Normal Depth	3.47	ft
Discharge	152	cfs
Water Surface Elevation	5,014.38	ft
Channel Depth	6.35	ft
Channel Width	187.99	ft
Flow Area	56.7	sq.ft.
Wetted Perimeter	30.2	ft
Top Width	29.01	ft
Hydraulic Depth	1.955	ft
Hydraulic Radius	1.878	ft
Critical Depth	2.11	ft
Critical Slope	4.50485	%
Velocity	2.68	ft/s
Velocity Head	0.11	ft
Specific Energy	3.59	ft
Froude Number	0.338	
Velocity Depth Product	9.31	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "E" - REF. REACH
100 YEAR (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0637	
Manning N Method	Cox/USACE	
Channel Slope	0.58	%
Normal Depth	5.32	ft
Discharge	408	cfs
Water Surface Elevation	5,016.23	ft
Channel Depth	6.35	ft
Channel Width	187.99	ft
Flow Area	203.35	sq.ft.
Wetted Perimeter	169.6	ft
Top Width	168.02	ft
Hydraulic Depth	1.21	ft
Hydraulic Radius	1.199	ft
Critical Depth	3.33	ft
Critical Slope	5.03873	%
Velocity	2.01	ft/s
Velocity Head	0.06	ft
Specific Energy	5.39	ft
Froude Number	0.322	
Velocity Depth Product	10.68	sq.ft./s
Flow Type	Sub-Critical	

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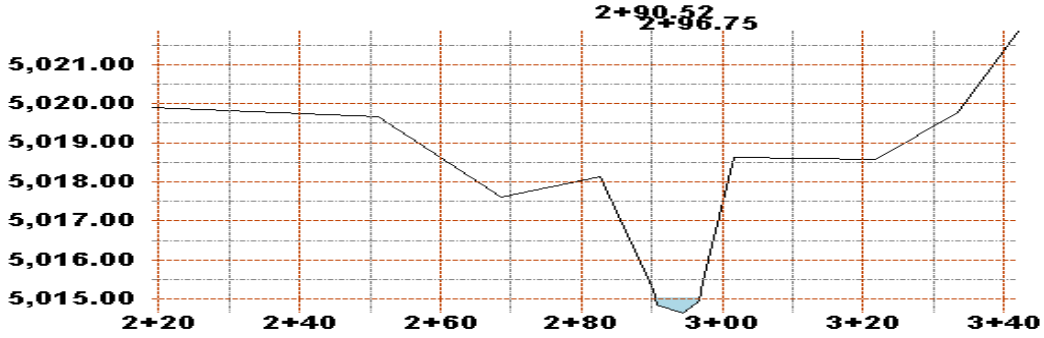
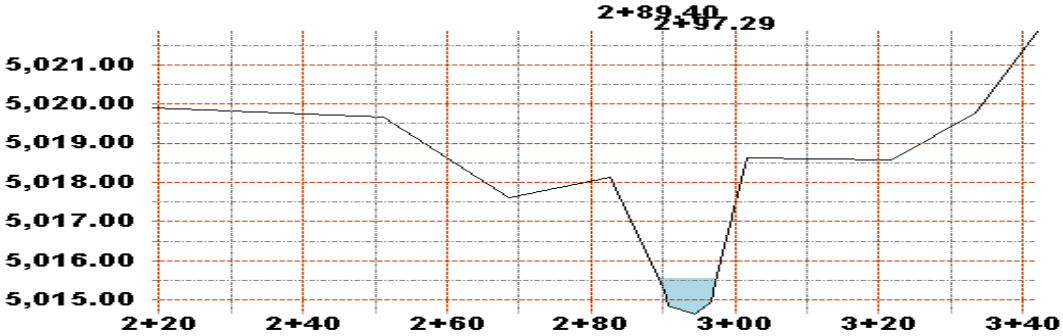
MOORES CREEK - SECTION "F" - REFERENCE REACH (BASE FLOW - 3 CFS)



MOORES CREEK - SECTION "F" - REFERENCE REACH (OHW FLOW - 16.5 CFS)



MOORES CREEK SECTION "F" - PROPOSED BASE FLOW (3 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.04	
Manning N Method	Cox/USACE	
Channel Slope	1.42	%
Normal Depth	0.4	ft
Discharge	3	cfs
Water Surface Elevation	5,015.04	ft
Channel Depth	5.26	ft
Channel Width	122.80	ft
Flow Area	1.66	sq.ft.
Wetted Perimeter	6.36	ft
Top Width	6.23	ft
Hydraulic Depth	0.266	ft
Hydraulic Radius	0.261	ft
Critical Depth	0.33	ft
Critical Slope	4.0729	%
Velocity	1.81	ft/s
Velocity Head	0.05	ft
Specific Energy	0.45	ft
Froude Number	0.617	
Velocity Depth Product	0.73	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "F" - PROPOSED ORDINARY HIGH WATER (16.5 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0416	
Manning N Method	Cox/USACE	
Channel Slope	1.42	%
Normal Depth	0.92	ft
Discharge	16.5	cfs
Water Surface Elevation	5,015.56	ft
Channel Depth	5.26	ft
Channel Width	122.80	ft
Flow Area	5.27	sq.ft.
Wetted Perimeter	8.35	ft
Top Width	7.89	ft
Hydraulic Depth	0.669	ft
Hydraulic Radius	0.631	ft
Critical Depth	0.74	ft
Critical Slope	3.12235	%
Velocity	3.13	ft/s
Velocity Head	0.15	ft
Specific Energy	1.07	ft
Froude Number	0.675	
Velocity Depth Product	2.88	sq.ft./s
Flow Type	Sub-Critical	

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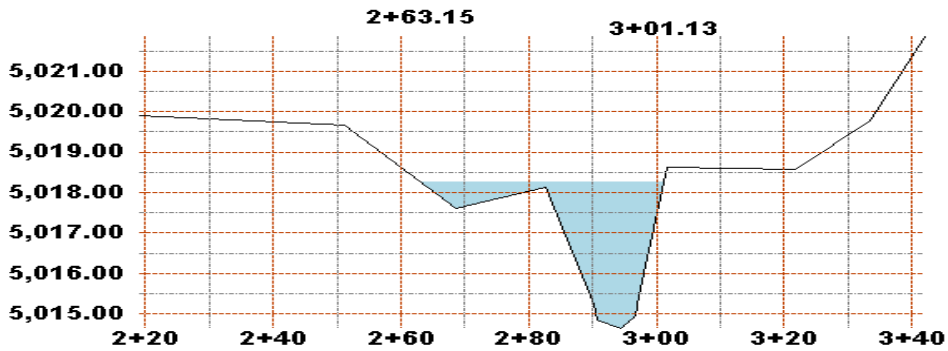
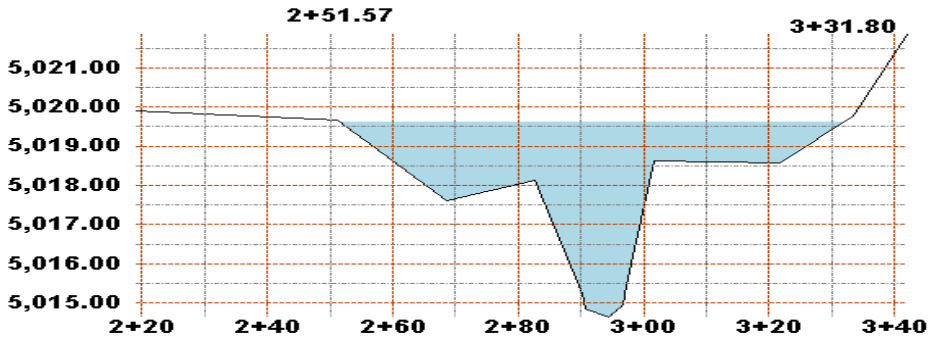
MOORES CREEK - SECTION "F" - REFERENCE REACH (10 YEAR - 152 CFS)



MOORES CREEK - SECTION "F" - REFERENCE REACH (100 YR FLOW - 408 CFS)



MOORES CREEK SECTION "F" - REF. REACH
10 YEAR (152 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0637	
Manning N Method	Cox/USACE	
Channel Slope	1.42	%
Normal Depth	3.61	ft
Discharge	152	cfs
Water Surface Elevation	5,018.25	ft
Channel Depth	5.26	ft
Channel Width	122.80	ft
Flow Area	48.17	sq.ft.
Wetted Perimeter	39.81	ft
Top Width	37.98	ft
Hydraulic Depth	1.268	ft
Hydraulic Radius	1.21	ft
Critical Depth	2.41	ft
Critical Slope	3.82911	%
Velocity	3.16	ft/s
Velocity Head	0.15	ft
Specific Energy	3.76	ft
Froude Number	0.494	
Velocity Depth Product	11.38	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "F" - REF. REACH
100 YEAR (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.08	
Manning N Method	Cox/USACE	
Channel Slope	1.42	%
Normal Depth	4.97	ft
Discharge	408	cfs
Water Surface Elevation	5,019.61	ft
Channel Depth	5.26	ft
Channel Width	122.80	ft
Flow Area	133.51	sq.ft.
Wetted Perimeter	82.31	ft
Top Width	80.23	ft
Hydraulic Depth	1.664	ft
Hydraulic Radius	1.622	ft
Critical Depth	3.9	ft
Critical Slope	6.21639	%
Velocity	3.06	ft/s
Velocity Head	0.15	ft
Specific Energy	5.11	ft
Froude Number	0.418	
Velocity Depth Product	15.18	sq.ft./s
Flow Type	Sub-Critical	

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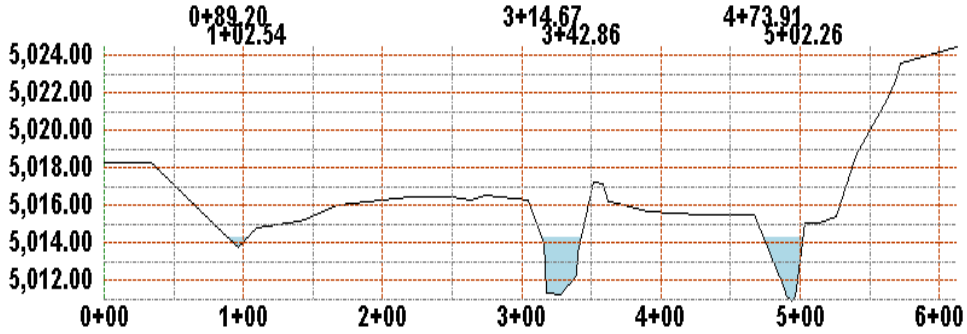
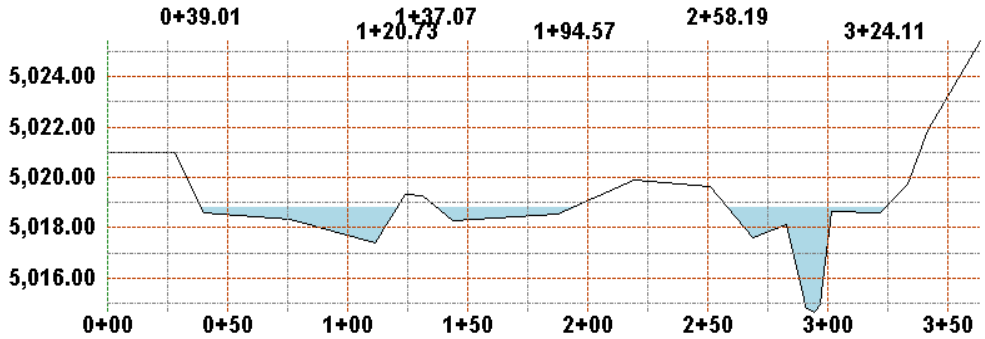
MOORES CREEK - SECTION "E" - REFERENCE REACH (100 YEAR FLOW - 408 CFS)



MOORES CREEK - SECTION "F" - REFERENCE REACH (100 YEAR FLOW - 408 CFS)



MOORES CREEK SECTION "E" - REF. REACH
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0478	
Manning N Method	Cox/USACE	
Channel Slope	0.58	%
Normal Depth	3.38	ft
Discharge	408	cfs
Water Surface Elevation	5,014.29	ft
Channel Depth	7.39	ft
Channel Width	613.00	ft
Flow Area	122.44	sq.ft.
Wetted Perimeter	73.44	ft
Top Width	69.88	ft
Hydraulic Depth	1.752	ft
Hydraulic Radius	1.667	ft
Critical Depth	2.2	ft
Critical Slope	2.72588	%
Velocity	3.33	ft/s
Velocity Head	0.17	ft
Specific Energy	3.56	ft
Froude Number	0.444	
Velocity Depth Product	11.27	sq.ft./s
Flow Type	Sub-Critical	

MOORES CREEK SECTION "F" - REF. REACH
100 YEAR FLOW (408 CFS)

Description	Value	Units
Manning's Equation		
Manning N Value	0.0537	
Manning N Method	Cox/USACE	
Channel Slope	1.42	%
Normal Depth	4.19	ft
Discharge	408	cfs
Water Surface Elevation	5,018.83	ft
Channel Depth	6.36	ft
Channel Width	363.31	ft
Flow Area	152.10	sq.ft.
Wetted Perimeter	207.32	ft
Top Width	205.14	ft
Hydraulic Depth	0.741	ft
Hydraulic Radius	0.734	ft
Critical Depth	3.86	ft
Critical Slope	5.34011	%
Velocity	2.68	ft/s
Velocity Head	0.11	ft
Specific Energy	4.3	ft
Froude Number	0.549	
Velocity Depth Product	11.24	sq.ft./s
Flow Type	Sub-Critical	