

Hydrology and Hydraulics Report

Jackson Great Farm Bridge #3128

WIN 023567.00

WIN:	23567.00		
Town:	Jackson		
Route No.	ME-7		
Asset ID:	3128		
Lat:	44.59663	Long:	-69.1412

Project Name:	
Stream Name:	Great Farm Brook
Bridge Name:	Great Farm Bridge
Analysis by:	csh
Date:	4/15/2020

Peak Flow Calculations by USGS Regression Equations (Hodgkins, 1999 & Lombard/Hodgkins, 2015)

Enter data in blue cells only!

	km ²	mi ²	ac
A	16.58	6.40	4096.0
W	1.05	0.4	259.3

Enter data in [mi²]

Watershed Area *DRNAREA*
Wetlands area (by NWI)

P _c	486481	4939732
County	Waldo	

watershed centroid (E, N; UTM 19N; meters)

choose county from drop-down menu

pptA

mean annual precipitation (inches; by look-up)

A (km²)

Conf Lvl

W (%)

NWI Wetlands % *STORNWI*

References:

Hodgkins, G.A., 1999.

Estimating the magnitude of peak flows for streams
in Maine for selected recurrence intervals

WRIR 99-4008, USGS Augusta, ME

ver. 2020 Feb 07

Worksheet prepared by:

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Augusta, ME 04333-0016
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Watershed Characteristics for Monthly & Daily Flows

EAVG	625.3
SLOPE	9.47
EMAX	1029.8
WATER	0.03
PRECIP	46.3
SG	0.00
HGA	0
DIST	64.00

mean basin elevation (ft)

mean basin slope (%)

maximum basin elevation (ft)

percent of drainage basin land cover classified as open water

mean annual precipitation

sand & gravel aquifer as decimal fraction of watershed A

mean basin percentage of hydrological soil group A

distance from the coast (mi)

Ret Pd	Peak Flow Estimate		
	T (yr)	Lower	Upper
1.1		3.08	
2		6.48	
5		10.33	
10		13.11	
25		17.22	
50		20.24	
100		23.72	
500		32.22	

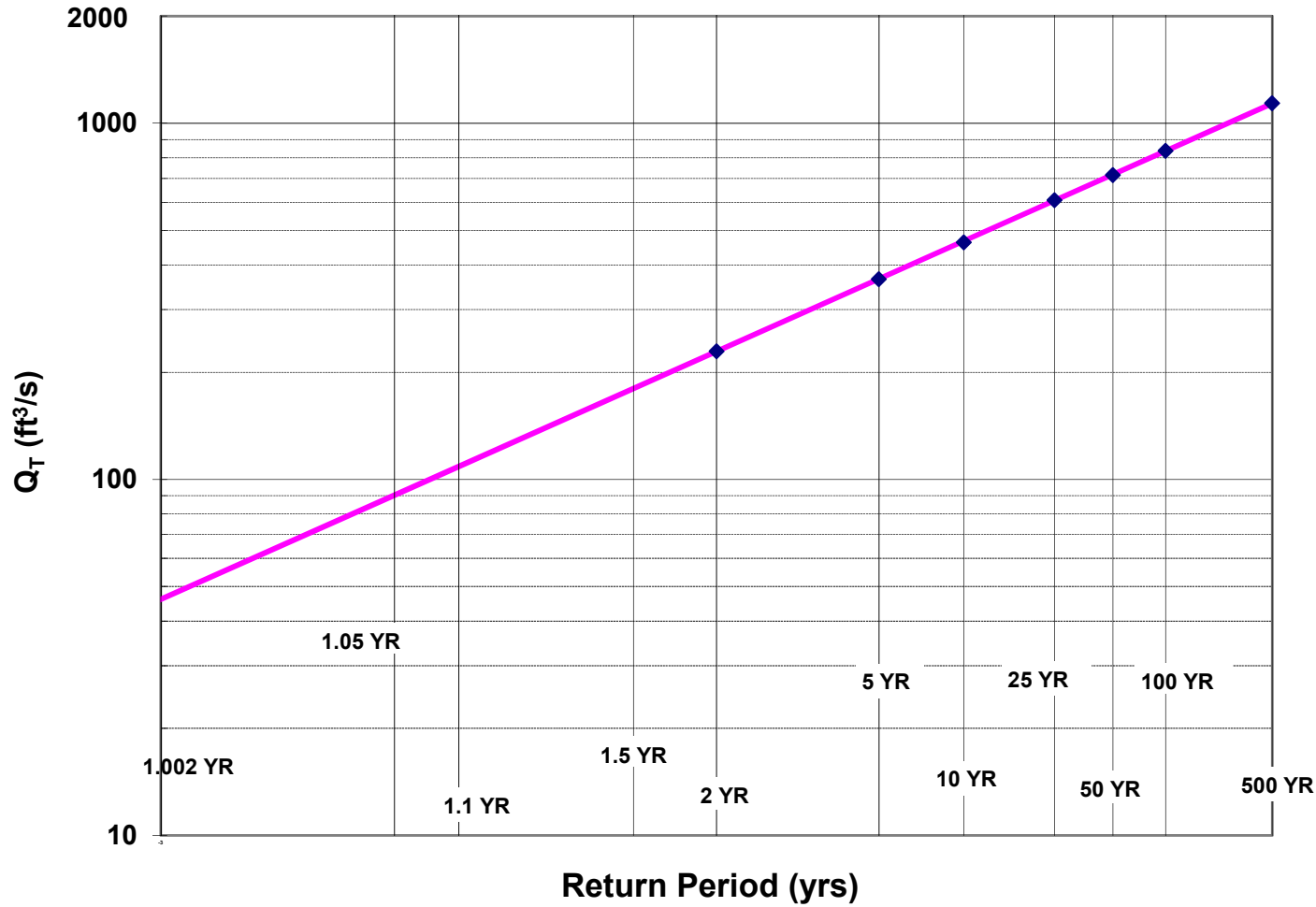
Q _T (ft ³ /s)
108.8
228.9
364.9
462.9
608.0
714.8
837.5
1137.8

Lombard, P.J. & G.A. Hodgkins, 2015.

Peak flow regression equations for small, ungaged streams in
Maine - Comparing map-based to field-based variables
SIR 2015-4059, USGS, Augusta, ME

$$Q_T = b \times A^a \times 10^{-wW}$$

Log-Normal Probability Plot



WIN:	23567.00
Town:	Jackson
Route No.	ME-7
Asset ID:	3128
Lat:	44.59663
Long:	-69.14115

Project Name:	0
Stream Name:	Great Farm Brook
Bridge Name:	Great Farm Bridge
Analysis by:	csh
Date:	4/15/2020

DO NOT ENTER ANY DATA ON THIS PAGE; EVERYTHING IS CALCULATED

MAINE MONTHLY MEDIAN FLOWS and HYDRAULIC GEOMETRY BY USGS REGRESSION EQUATIONS (2004, 2013, 2015)

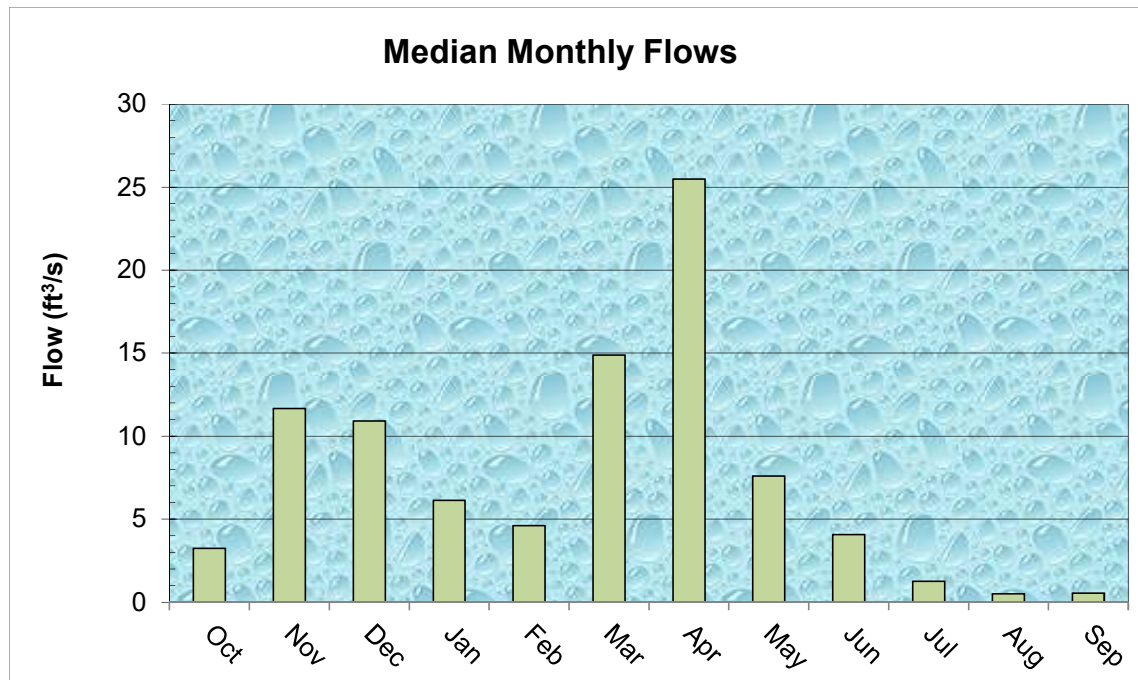
Value	Variable	Explanation
6.40	A	Area (mi ²)
486481	P _c	Watershed centroid (E,N; UTM; Zone 19; meters)
63.07	DIST	Distance from Coastal reference line (mi)
46.3	pptA	Mean Annual Precipitation (inches)
0.00	SG	Sand & Gravel Aquifer (decimal fraction of watershed area)

Month	Q _{median} (ft ³ /s)	(m ³ /s)
Jan	6.14	0.1739
Feb	4.62	0.1309
Mar	14.89	0.4221
Apr	25.48	0.7222
May	7.61	0.2155
Jun	4.08	0.1157
Jul	1.26	0.0357
Aug	0.52	0.0146
Sep	0.55	0.0157
Oct	3.25	0.0920
Nov	11.67	0.3308
Dec	10.91	0.3092

Q _{bf}	36.4
ann avg	14.4
ann med	6.0
Q _{1.002}	46.0
Q _{1.01}	62.5
Q _{1.05}	90.3
Q _{bf}	105.0

assume v = 4ft/s

W _{bf}	23.5	estimated bankfull width (ft)
d _{bf}	1.1	estimated bankfull depth (ft)
A _{bf}	22.5	estimated bankfull flow area (ft ²)



References

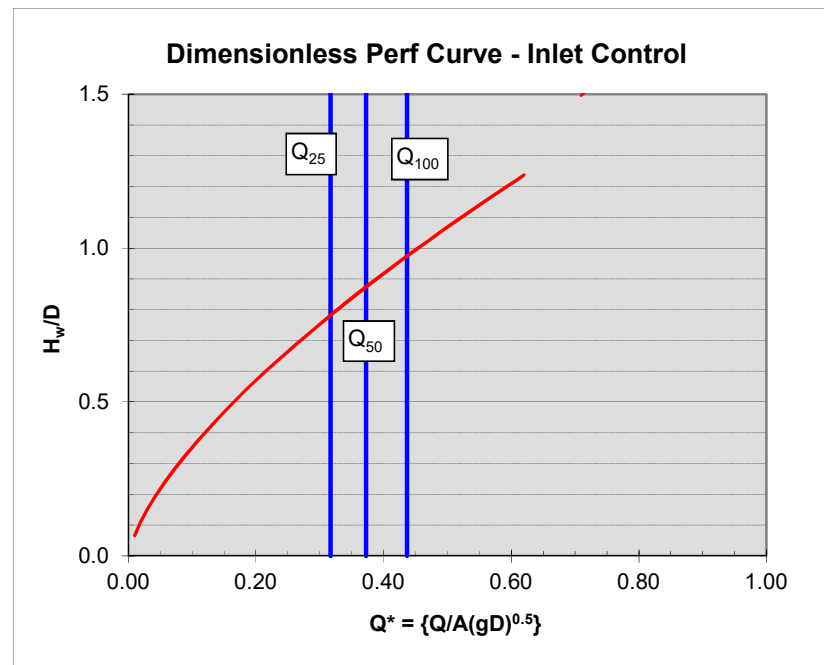
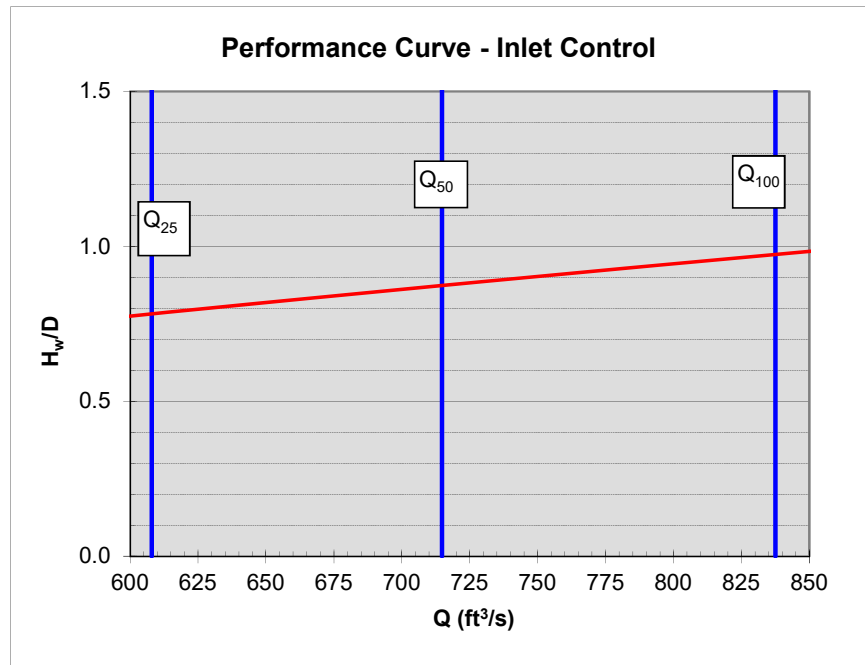
- Dudley, 2013. FY2013 Progress Report - Phase 1 ..., USFWS QRP Project
- Dudley, 2004. Estimating Monthly Streamflows ... , SIR 2004-5026
- Dudley, 2015. Regression Equations for Monthly & Annual Mean..., USGS SIR 2015-5151

NOTE: This page is for preliminary sizing only.
Final design should be done with HY8 or HDS-5

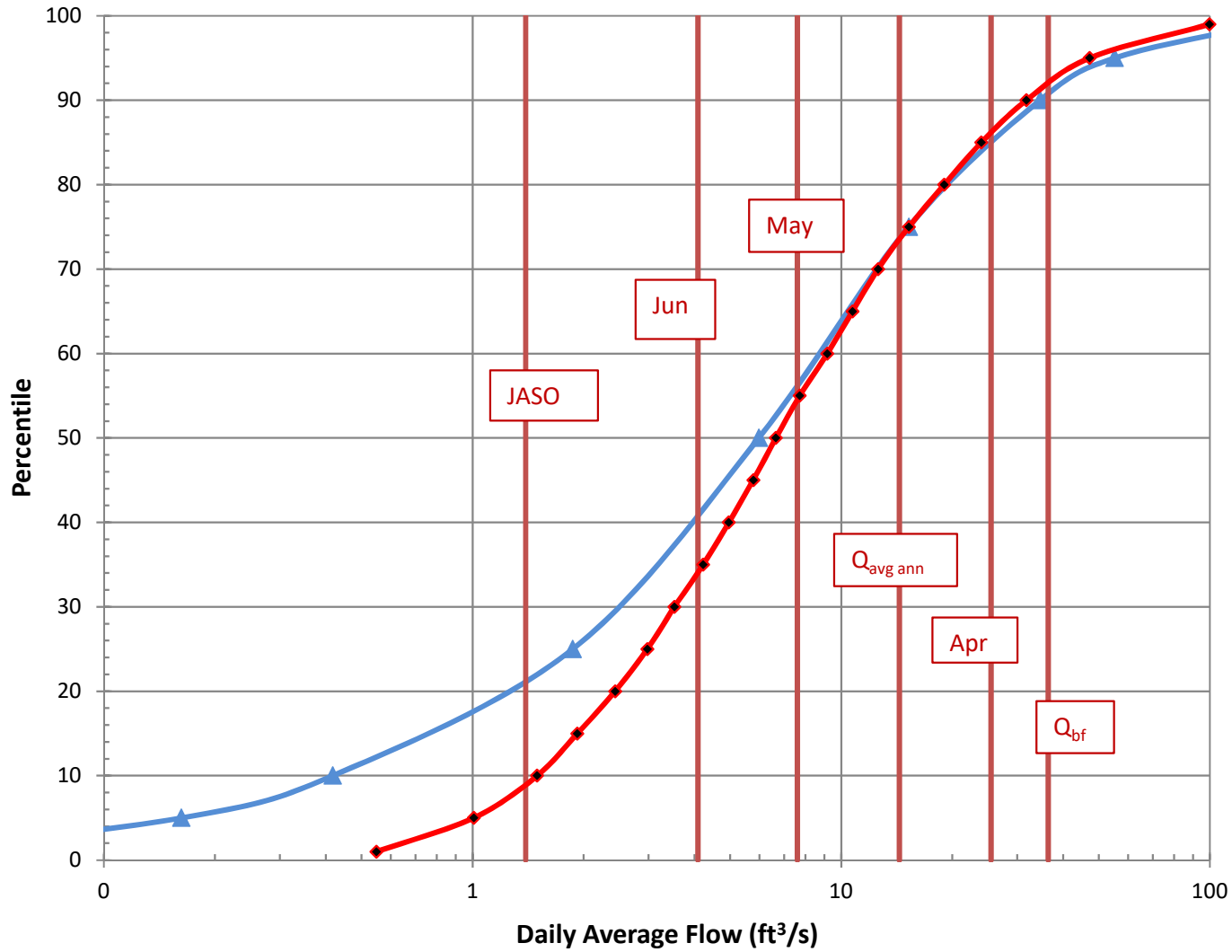
Preliminary Culvert Sizing - Round & Box Culverts

Shape:	Box			
Type:	Box 0 ww			
D or R (ft)	6	Q ₂₅	608.0	trial D / R = 11.5
w (ft)	23 box width	Q ₅₀	714.8	
Slope (ft/ft)	0.02	Q ₁₀₀	837.5	
A (ft ²)	138.00			
g (ft/s ²)	32.2			

Note:
culvert dimensions are for open flow area; adjust for lost capacity due to embedding / backfilling (min {2' / 25% rise} embedment)



Daily Average Flow Distribution



Daily Avg Flow Dist

$A_{ws} = (mi^2)$ 6.4

Q (ft³/s)

Pctl	Median	84 th pctl
1	0.55	0.97
5	1.01	1.62
10	1.50	2.25
15	1.92	2.81
20	2.44	3.41
25	2.98	3.99
30	3.53	4.55
35	4.22	5.20
40	4.95	5.98
45	5.77	6.76
50	6.65	7.98
55	7.72	9.29
60	9.17	10.90
65	10.73	12.70
70	12.58	14.82
75	15.25	17.82
80	19.02	21.28
85	24.00	27.27
90	31.79	36.61
95	47.19	56.94
99	99.78	131.36

Q_{bf} 36.4

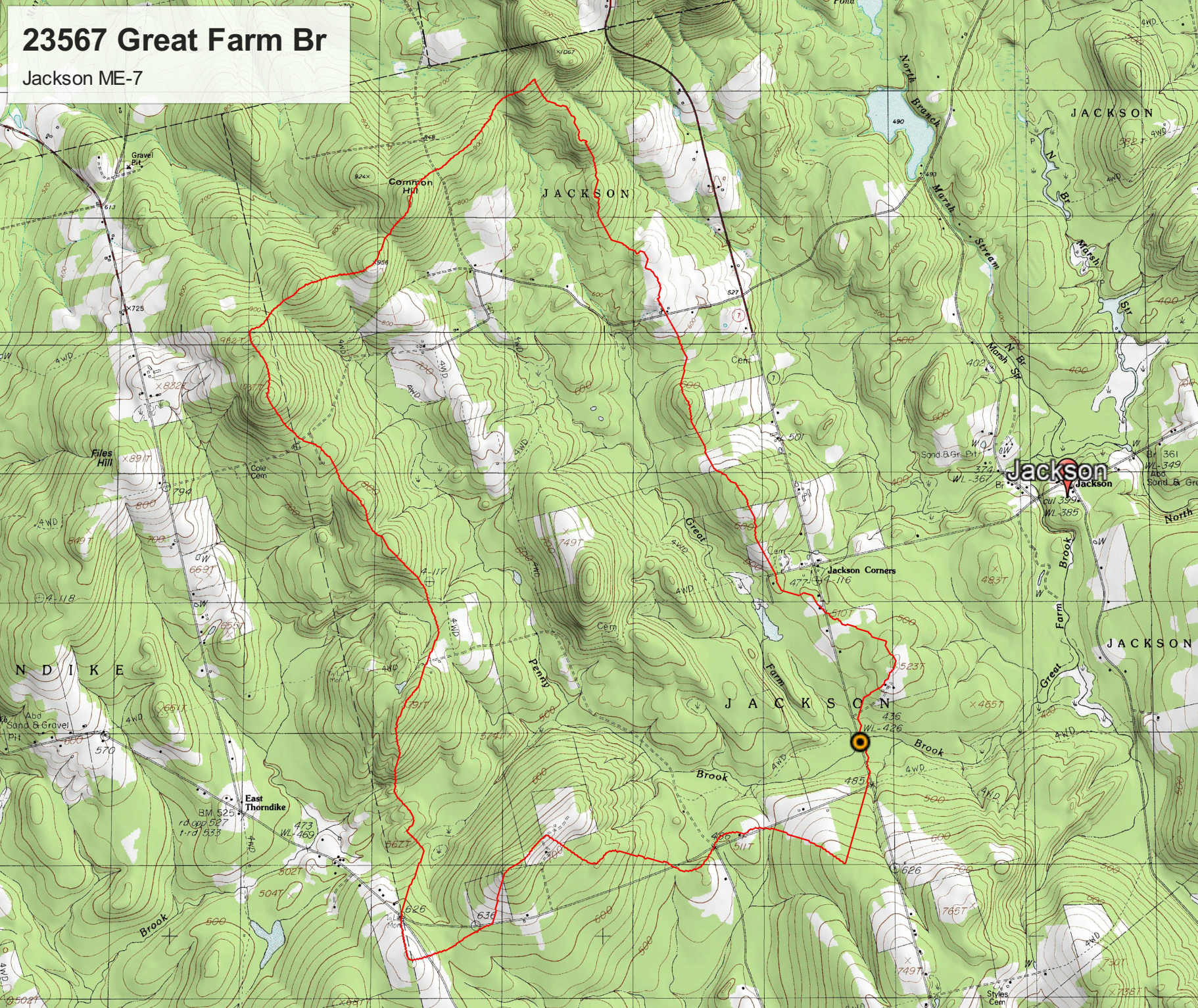
$Q_{1.002}$ 46.0

$Q_{1.1}$ 108.8

Q_2 228.9

23567 Great Farm Br

Jackson ME-7



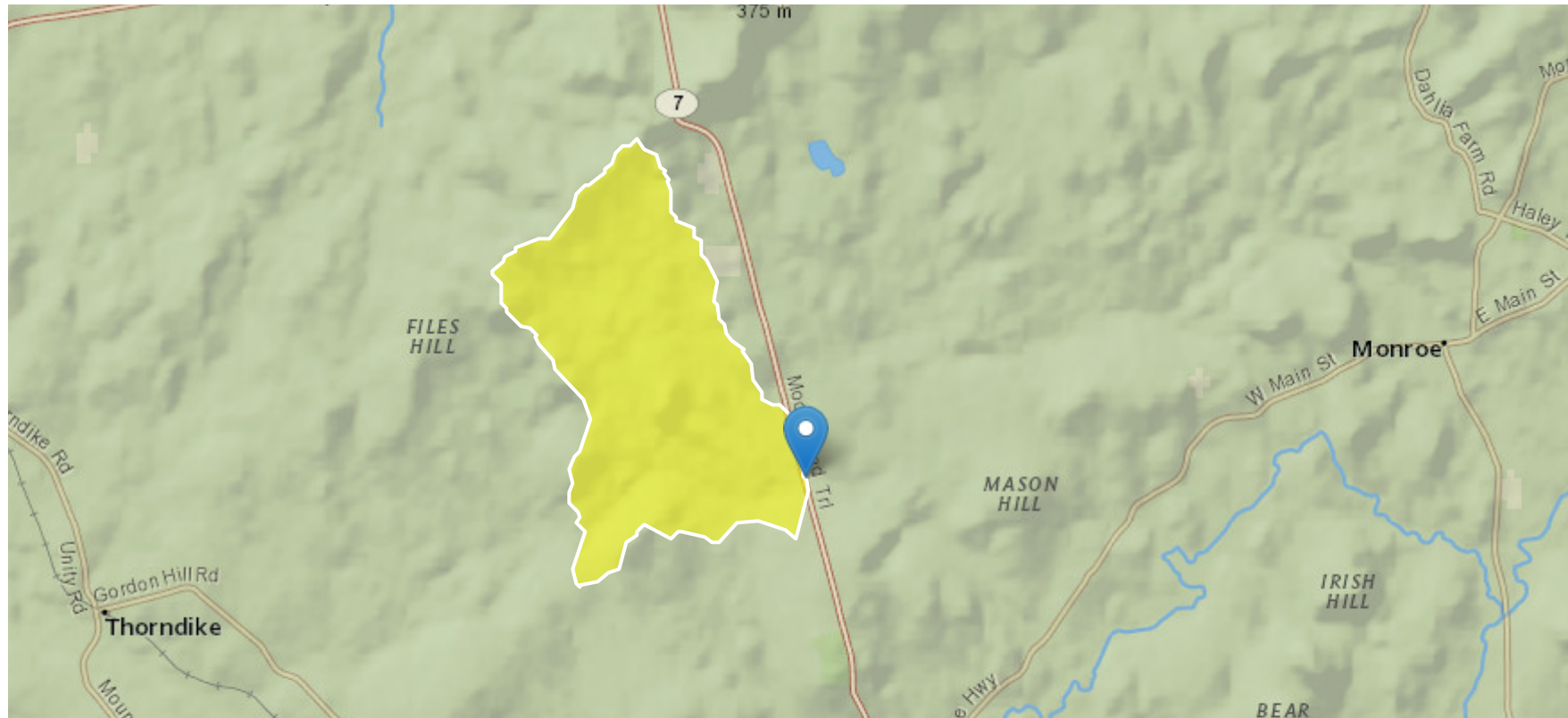
Jackson 23567 Great Farm Br #3128

Region ID: ME

Workspace ID: ME20200406172448674000

Clicked Point (Latitude, Longitude): 44.59663, -69.14115

Time: 2020-04-06 13:25:05 -0400



Basin Characteristics

Existing Bridge

HEC-RAS Plan:

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach	2545.293	Q 1.1	108.80	425.43	428.75	427.06	428.79	0.000542	1.74	66.97	34.05	0.20
Reach	2545.293	Q 2	228.90	425.43	429.50	427.67	429.61	0.000911	2.71	114.22	98.15	0.27
Reach	2545.293	Q 5	364.90	425.43	430.13	428.19	430.28	0.001073	3.33	192.12	143.93	0.30
Reach	2545.293	Q 10	462.90	425.43	430.51	428.51	430.70	0.001191	3.74	253.89	282.95	0.32
Reach	2545.293	Q 25	608.00	425.43	431.08	428.81	431.24	0.001013	3.75	394.20	300.81	0.30
Reach	2545.293	Q 50	714.80	425.43	431.47	429.43	431.62	0.000901	3.73	490.98	301.45	0.29
Reach	2545.293	Q 100	837.50	425.43	431.89	429.92	432.03	0.000800	3.71	596.43	302.13	0.28
Reach	2545.293	Q 500	1137.80	425.43	432.85	430.19	432.97	0.000638	3.69	835.74	303.77	0.26
Reach	2454.257	Q 1.1	108.80	426.00	428.64		428.71	0.001809	2.15	55.70	85.74	0.27
Reach	2454.257	Q 2	228.90	426.00	429.39		429.48	0.001820	2.69	167.06	273.53	0.29
Reach	2454.257	Q 5	364.90	426.00	430.05		430.12	0.001264	2.60	331.55	375.98	0.25
Reach	2454.257	Q 10	462.90	426.00	430.47		430.52	0.001036	2.54	435.89	394.95	0.23
Reach	2454.257	Q 25	608.00	426.00	431.03		431.08	0.000839	2.51	576.67	423.29	0.21
Reach	2454.257	Q 50	714.80	426.00	431.42		431.46	0.000745	2.51	673.66	464.44	0.20
Reach	2454.257	Q 100	837.50	426.00	431.84		431.88	0.000668	2.51	779.78	477.15	0.20
Reach	2454.257	Q 500	1137.80	426.00	432.80		432.85	0.000548	2.55	1021.25	501.08	0.18
Reach	2413.509	Q 1.1	108.80	426.09	428.52		428.62	0.001643	2.64	65.94	209.34	0.33
Reach	2413.509	Q 2	228.90	426.09	429.23		429.35	0.001627	3.23	171.42	339.88	0.35
Reach	2413.509	Q 5	364.90	426.09	429.87		429.97	0.001320	3.36	280.91	378.42	0.33
Reach	2413.509	Q 10	462.90	426.09	430.28		430.38	0.001170	3.43	352.31	393.91	0.31
Reach	2413.509	Q 25	608.00	426.09	430.85		430.95	0.001023	3.53	449.57	416.22	0.30
Reach	2413.509	Q 50	714.80	426.09	431.24		431.34	0.000945	3.59	516.74	424.93	0.29
Reach	2413.509	Q 100	837.50	426.09	431.67		431.77	0.000875	3.67	590.19	434.44	0.29
Reach	2413.509	Q 500	1137.80	426.09	432.64		432.74	0.000760	3.84	756.90	456.22	0.28
Reach	2374.589	Q 1.1	108.80	426.59	428.46	427.69	428.54	0.002279	2.28	53.62	228.41	0.36
Reach	2374.589	Q 2	228.90	426.59	429.17	428.24	429.27	0.001708	2.68	134.88	304.99	0.34
Reach	2374.589	Q 5	364.90	426.59	429.80	428.74	429.91	0.001381	2.91	213.37	327.49	0.32
Reach	2374.589	Q 10	462.90	426.59	430.21	428.97	430.33	0.001237	3.05	264.25	333.78	0.31
Reach	2374.589	Q 25	608.00	426.59	430.77	429.21	430.89	0.001095	3.22	333.65	342.36	0.30
Reach	2374.589	Q 50	714.80	426.59	431.16	429.37	431.29	0.001019	3.33	381.64	354.68	0.30
Reach	2374.589	Q 100	837.50	426.59	431.59	429.53	431.72	0.000951	3.44	434.16	369.42	0.29
Reach	2374.589	Q 500	1137.80	426.59	432.55	429.90	432.70	0.000837	3.69	553.37	383.07	0.28
Reach	2302.087		Bridge									
Reach	2244.899	Q 1.1	108.80	420.03	426.87		426.87	0.000044	0.55	200.84	61.47	0.05
Reach	2244.899	Q 2	228.90	420.03	427.59		427.60	0.000112	0.98	254.95	121.12	0.08
Reach	2244.899	Q 5	364.90	420.03	428.01		428.04	0.000210	1.41	292.28	149.81	0.11
Reach	2244.899	Q 10	462.90	420.03	428.25		428.29	0.000287	1.70	314.35	157.31	0.13
Reach	2244.899	Q 25	608.00	420.03	428.55		428.61	0.000406	2.10	343.70	221.96	0.15
Reach	2244.899	Q 50	714.80	420.03	428.74		428.83	0.000495	2.37	362.93	269.12	0.17
Reach	2244.899	Q 100	837.50	420.03	428.95		429.05	0.000598	2.66	383.20	285.82	0.19
Reach	2244.899	Q 500	1137.80	420.03	429.39		429.55	0.000850	3.33	426.49	313.33	0.23
Reach	2212.387	Q 1.1	108.80	416.32	426.87		426.87	0.000005	0.27	410.18	63.21	0.02
Reach	2212.387	Q 2	228.90	416.32	427.59		427.60	0.000017	0.51	467.84	117.78	0.03
Reach	2212.387	Q 5	364.90	416.32	428.02		428.03	0.000036	0.76	521.47	183.16	0.05
Reach	2212.387	Q 10	462.90	416.32	428.26		428.28	0.000052	0.93	553.54	243.25	0.06
Reach	2212.387	Q 25	608.00	416.32	428.57		428.59	0.000078	1.17	599.38	283.98	0.07
Reach	2212.387	Q 50	714.80	416.32	428.78		428.80	0.000099	1.34	630.25	294.88	0.08
Reach	2212.387	Q 100	837.50	416.32	428.99		429.02	0.000123	1.52	662.92	306.24	0.09
Reach	2212.387	Q 500	1137.80	416.32	429.45		429.50	0.000187	1.94	733.23	323.83	0.11
Reach	2141.412	Q 1.1	108.80	424.16	426.82		426.86	0.000916	1.69	66.09	41.73	0.20
Reach	2141.412	Q 2	228.90	424.16	427.50		427.58	0.001349	2.44	164.52	251.84	0.25
Reach	2141.412	Q 5	364.90	424.16	427.91		428.02	0.001620	2.93	265.70	314.25	0.28
Reach	2141.412	Q 10	462.90	424.16	428.14		428.26	0.001755	3.19	324.12	325.09	0.30
Reach	2141.412	Q 25	608.00	424.16	428.44		428.57	0.001897	3.50	400.31	338.45	0.31
Reach	2141.412	Q 50	714.80	424.16	428.64		428.77	0.001979	3.69	450.78	347.45	0.32
Reach	2141.412	Q 100	837.50	424.16	428.85		428.99	0.002054	3.89	504.84	357.18	0.33
Reach	2141.412	Q 500	1137.80	424.16	429.31		429.46	0.002201	4.31	623.18	371.10	0.35
Reach	2052.879	Q 1.1	108.80	423.72	426.62	425.43	426.69	0.005004	2.93	70.13	70.29	0.42
Reach	2052.879	Q 2	228.90	423.72	427.26	425.93	427.36	0.004992	3.72	151.18	186.22	0.45
Reach	2052.879	Q 5	364.90	423.72	427.65	426.31	427.77	0.005003	4.16	226.52	235.68	0.46
Reach	2052.879	Q 10	462.90	423.72	427.87	426.35	427.99	0.005005	4.41	273.20	248.27	0.47
Reach	2052.879	Q 25	608.00	423.72	428.16	426.38	428.29	0.005002	4.71	336.06	264.63	0.48
Reach	2052.879	Q 50	714.80	423.72	428.35	426.44	428.49	0.005008	4.91	378.78	275.40	0.48
Reach	2052.879	Q 100	837.50	423.72	428.56	426.47	428.70	0.005001	5.11	425.69	286.94	0.49
Reach	2052.879	Q 500	1137.80	423.72	429.00	427.98	429.16	0.005000	5.54	531.74	312.00	0.50

HEC-RAS Plan: Plan 01 River: Stream Reach: Reach

Reach	River Sta	Profile	E. G. US. (ft)	Min El Prs (ft)	BR Open Area (sq ft)	Q Total (cfs)	Min El Weir Flow (ft)	Delta EG (ft)	BR Open Vel (ft/s)
Reach	2302.087	Q 1.1	428.08	432.96	229.77	108.80	436.11	1.21	3.76
Reach	2302.087	Q 2	428.77	432.96	229.77	228.90	436.11	1.17	4.88
Reach	2302.087	Q 5	429.27	432.96	229.77	364.90	436.11	1.23	6.41
Reach	2302.087	Q 10	429.54	432.96	229.77	462.90	436.11	1.25	7.41
Reach	2302.087	Q 25	429.99	432.96	229.77	608.00	436.11	1.38	8.29
Reach	2302.087	Q 50	430.32	432.96	229.77	714.80	436.11	1.49	8.75
Reach	2302.087	Q 100	430.68	432.96	229.77	837.50	436.11	1.63	10.14
Reach	2302.087	Q 500	431.55	432.96	229.77	1137.80	436.11	2.00	11.15

Proposed Bridge

HEC-RAS Plan: 12 River: Stream Reach: Reach

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach	2545.293	Q 1.1	108.80	425.43	428.77	427.07	428.82	0.000523	1.72	67.82	34.23	0.20
Reach	2545.293	Q 2	228.90	425.43	429.72	427.67	429.81	0.000696	2.48	138.38	120.80	0.24
Reach	2545.293	Q 5	364.90	425.43	430.41	428.19	430.53	0.000782	2.98	232.37	174.49	0.26
Reach	2545.293	Q 10	462.90	425.43	430.84	428.51	430.97	0.000790	3.21	345.99	350.51	0.27
Reach	2545.293	Q 25	608.00	425.43	431.45	428.81	431.56	0.000671	3.21	556.94	461.21	0.25
Reach	2545.293	Q 50	714.80	425.43	431.86	429.43	431.96	0.000577	3.14	744.67	545.24	0.24
Reach	2545.293	Q 100	837.50	425.43	432.32	429.92	432.40	0.000459	2.96	979.72	573.24	0.21
Reach	2545.293	Q 500	1137.80	425.43	433.35	430.19	433.39	0.000293	2.62	1513.05	600.00	0.18
Reach	2454.257	Q 1.1	108.80	426.00	428.67		428.73	0.001711	2.11	57.52	91.34	0.27
Reach	2454.257	Q 2	228.90	426.00	429.65		429.71	0.001057	2.18	232.38	346.25	0.22
Reach	2454.257	Q 5	364.90	426.00	430.37		430.41	0.000747	2.12	411.28	390.47	0.20
Reach	2454.257	Q 10	462.90	426.00	430.81		430.85	0.000638	2.12	522.73	411.90	0.18
Reach	2454.257	Q 25	608.00	426.00	431.41		431.45	0.000541	2.13	672.89	463.95	0.17
Reach	2454.257	Q 50	714.80	426.00	431.82		431.86	0.000493	2.16	776.10	477.13	0.17
Reach	2454.257	Q 100	837.50	426.00	432.27		432.31	0.000453	2.18	888.43	483.47	0.16
Reach	2454.257	Q 500	1137.80	426.00	433.28		433.33	0.000496	2.56	1175.26	510.62	0.18
Reach	2413.509	Q 1.1	108.80	426.09	428.56		428.65	0.001512	2.56	69.82	218.68	0.32
Reach	2413.509	Q 2	228.90	426.09	429.55		429.62	0.000873	2.56	227.30	356.88	0.26
Reach	2413.509	Q 5	364.90	426.09	430.25		430.32	0.000759	2.75	348.85	392.45	0.25
Reach	2413.509	Q 10	462.90	426.09	430.69		430.76	0.000706	2.86	422.71	411.65	0.25
Reach	2413.509	Q 25	608.00	426.09	431.29		431.36	0.000651	3.01	525.44	426.05	0.24
Reach	2413.509	Q 50	714.80	426.09	431.70		431.77	0.000619	3.10	596.20	435.22	0.24
Reach	2413.509	Q 100	837.50	426.09	432.15		432.22	0.000589	3.20	673.23	445.20	0.24
Reach	2413.509	Q 500	1137.80	426.09	433.17		433.25	0.000536	3.41	847.69	468.04	0.23
Reach	2374.589	Q 1.1	108.80	426.59	428.51	427.69	428.58	0.002006	2.19	57.14	239.75	0.34
Reach	2374.589	Q 2	228.90	426.59	429.52	428.24	429.58	0.000869	2.14	178.17	323.14	0.25
Reach	2374.589	Q 5	364.90	426.59	430.21	428.74	430.28	0.000774	2.41	263.61	333.70	0.25
Reach	2374.589	Q 10	462.90	426.59	430.65	428.97	430.72	0.000732	2.57	317.68	340.38	0.25
Reach	2374.589	Q 25	608.00	426.59	431.24	429.21	431.32	0.000686	2.76	391.00	357.31	0.24
Reach	2374.589	Q 50	714.80	426.59	431.65	429.37	431.74	0.000658	2.89	441.57	370.34	0.24
Reach	2374.589	Q 100	837.50	426.59	432.09	429.53	432.19	0.000632	3.02	496.63	376.61	0.24
Reach	2374.589	Q 500	1137.80	426.59	433.10	429.90	433.21	0.000584	3.29	621.40	390.86	0.24
Reach	2302.087		Bridge									
Reach	2244.899	Q 1.1	108.80	420.03	426.87		426.87	0.000044	0.55	200.85	61.48	0.05
Reach	2244.899	Q 2	228.90	420.03	427.59		427.60	0.000112	0.98	254.94	121.10	0.08
Reach	2244.899	Q 5	364.90	420.03	428.01		428.04	0.000209	1.41	292.29	149.81	0.11
Reach	2244.899	Q 10	462.90	420.03	428.25		428.29	0.000287	1.70	314.36	157.32	0.13
Reach	2244.899	Q 25	608.00	420.03	428.55		428.61	0.000406	2.10	343.71	221.99	0.15
Reach	2244.899	Q 50	714.80	420.03	428.74		428.83	0.000495	2.37	362.94	269.14	0.17
Reach	2244.899	Q 100	837.50	420.03	428.95		429.05	0.000598	2.66	383.20	285.82	0.19
Reach	2244.899	Q 500	1137.80	420.03	429.39		429.55	0.000850	3.33	426.49	313.33	0.23
Reach	2212.387	Q 1.1	108.80	416.32	426.87		426.87	0.000005	0.27	410.18	63.21	0.02
Reach	2212.387	Q 2	228.90	416.32	427.59		427.60	0.000017	0.51	467.82	117.75	0.03
Reach	2212.387	Q 5	364.90	416.32	428.02		428.03	0.000036	0.76	521.48	183.18	0.05
Reach	2212.387	Q 10	462.90	416.32	428.27		428.28	0.000052	0.93	553.56	243.27	0.06
Reach	2212.387	Q 25	608.00	416.32	428.57		428.59	0.000078	1.17	599.39	283.99	0.07
Reach	2212.387	Q 50	714.80	416.32	428.78		428.80	0.000099	1.34	630.27	294.89	0.08
Reach	2212.387	Q 100	837.50	416.32	428.99		429.02	0.000123	1.52	662.93	306.25	0.09
Reach	2212.387	Q 500	1137.80	416.32	429.45		429.50	0.000187	1.94	733.24	323.84	0.11
Reach	2141.412	Q 1.1	108.80	424.16	426.82		426.86	0.000916	1.69	66.09	41.73	0.20
Reach	2141.412	Q 2	228.90	424.16	427.50		427.58	0.001349	2.45	164.45	251.75	0.25
Reach	2141.412	Q 5	364.90	424.16	427.91		428.02	0.001620	2.93	265.71	314.25	0.28
Reach	2141.412	Q 10	462.90	424.16	428.14		428.26	0.001755	3.19	324.12	325.09	0.30
Reach	2141.412	Q 25	608.00	424.16	428.44		428.57	0.001897	3.50	400.31	338.45	0.31
Reach	2141.412	Q 50	714.80	424.16	428.64		428.77	0.001979	3.69	450.79	347.46	0.32
Reach	2141.412	Q 100	837.50	424.16	428.85		428.99	0.002054	3.89	504.83	357.18	0.33
Reach	2141.412	Q 500	1137.80	424.16	429.31		429.46	0.002201	4.31	623.17	371.10	0.35
Reach	2052.879	Q 1.1	108.80	423.72	426.62	425.43	426.69	0.005004	2.93	70.13	70.29	0.42
Reach	2052.879	Q 2	228.90	423.72	427.26	425.93	427.36	0.005000	3.72	151.08	186.12	0.45
Reach	2052.879	Q 5	364.90	423.72	427.65	426.31	427.77	0.005003	4.16	226.52	235.68	0.46
Reach	2052.879	Q 10	462.90	423.72	427.87	426.35	427.99	0.005005	4.41	273.20	248.27	0.47
Reach	2052.879	Q 25	608.00	423.72	428.16	426.38	428.29	0.005002	4.71	336.06	264.63	0.48
Reach	2052.879	Q 50	714.80	423.72	428.35	426.44	428.49	0.005008	4.91	378.78	275.40	0.48
Reach	2052.879	Q 100	837.50	423.72	428.56	426.47	428.70	0.005001	5.11	425.69	286.94	0.49
Reach	2052.879	Q 500	1137.80	423.72	429.00	427.98	429.16	0.005001	5.54	531.73	312.00	0.50

HEC-RAS Plan: 12 River: Stream Reach: Reach

Reach	River Sta	Profile	E.G. U.S. (ft)	Min El Prs (ft)	BR Open Area (sq ft)	Prs O WS (ft)	Q Total (cfs)	Min El Weir Flow (ft)	Delta EG (ft)	W.S. Elev (ft)	BR Open Vel (ft/s)
Reach	2302.087	Q 1.1	428.58	433.31	169.47		108.80	437.01	1.71	428.51	5.56
Reach	2302.087	Q 2	429.58	433.31	169.47		228.90	437.01	1.98	429.52	8.28
Reach	2302.087	Q 5	430.28	433.31	169.47		364.90	437.01	2.24	430.21	8.72
Reach	2302.087	Q 10	430.72	433.31	169.47		462.90	437.01	2.43	430.65	9.49
Reach	2302.087	Q 25	431.32	433.31	169.47		608.00	437.01	2.71	431.24	10.50
Reach	2302.087	Q 50	431.74	433.31	169.47		714.80	437.01	2.91	431.65	11.04
Reach	2302.087	Q 100	432.19	433.31	169.47		837.50	437.01	3.14	432.09	11.63
Reach	2302.087	Q 500	433.21	433.31	169.47		1137.80	437.01	3.66	433.10	12.83