

DRAFT INSTREAM FLOW RECOMMENDATION

Ms. Linda Bassi
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

Dear Ms. Bassi:

The Bureau of Land Management (BLM) is writing this letter to formally communicate its recommendation for instream flow water rights on Dry Fork Roan Creek, located in Water Division 5.

Location and Land Status. Dry Fork Roan Creek originates on the south side of Cow Ridge, approximately 23 miles north of Grand Junction. Dry Fork Roan Creek flows into Roan Creek approximately 11 miles northwest of Debeque. This recommendation covers the stream reach beginning at the confluence of the South Dry Fork and North Fork Dry Fork and extends downstream to the confluence with Roan Creek. This stream reach covers a distance of approximately 6.0 miles. BLM manages 1.25 miles of this stream reach, while 4.75 miles are in private ownership.

Biological Summary. Dry Fork Roan Creek is a cool-water, moderate gradient stream in a stream valley that is approximately 0.5 mile wide. The stream is typically narrow, has a good width-depth ratio, and generally has small substrate. Portions of the stream that have recovered from historic overgrazing typically have good cover and a good mix of riffle and run habitat. The low number of pools limits the fish population. In areas that have not fully recovered from historic overgrazing, the stream is wider, has less cover, and exhibits less bank stability.

Fishery surveys indicate self-sustaining population of speckled dace, brook stickleback, and fathead minnows. Distribution of fishes in the creek varies seasonally, based upon water availability, operation of diversion structure and return flows.

The riparian community along Dry Fork Roan Creek is robust and recovering from historic grazing practices, providing improving cover and shading for the stream. The riparian community is comprised mainly of willow and Fremont cottonwood.

R2Cross Analysis. BLM collected the following R2Cross data from Dry Fork Roan Creek:

Cross Section Date	Discharge Rate	Top Width	Winter Flow Recommendation (meets 2 of 3 hydraulic criteria)	Summer Flow Recommendation (meets 3 of 3 hydraulic criteria)
05/15/2012 #1	0.78 cfs	8.3 feet	0.92 cfs	1.05 cfs
05/15/2012 #2	0.94 cfs	6.9 feet	1.22 cfs	1.78 cfs

Averages: 1.07 cfs 1.41 cfs

BLM's analysis of this data, coordinated with Colorado Parks and Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

1.4 cubic feet per second is recommended for the low-elevation snowmelt runoff and high temperature period from March 1 through May 31. This recommendation is driven by the wetted perimeter criteria. This creek experiences consistently low flows during late summer and fall, so it is important to protect as much physical habitat as possible during the limited time when snowmelt runoff flows are available.

1.2 cubic feet per second is recommended for the summer and fall period, from June 1 to November 30. This recommendation is driven by water availability, which is influenced by upstream irrigation practices. This flow rate meets the depth and velocity criteria while still maintaining 48% of wetted perimeter. This flow rate is capable of maintaining pool habitat in the creek and preventing excessively high temperatures.

1.05 cubic feet per second is recommended for the winter period from December 1 to February 28. This recommendation is driven by the depth criteria. It should provide sufficient flow to prevent pools from freezing and protect overwintering fish.

Water Availability. There are several sources of water availability information that could be used for this creek. BLM recommends using USGS Gage 09095300 (Dry Fork Fork at Upper Station near Debeque, CO) because it is located in the middle of the proposed instream flow reach. Despite the short period of record, it provides valuable data. BLM also recommends consulting the StreamStats package developed jointly between the U.S. Geological Survey and the CWCB.

BLM is aware of the following two water rights within the proposed instream flow reach:

Dry Fork Ditch – 2.4 cfs, 1886 and 1888 priorities
Omundson and Frost Ditch – 2.5 cfs, 1887 and 1909 priorities

BLM is aware of the following ditches located upstream from the proposed instream flow reach:

Smith Ditch – 1.0 cfs, 1912 priority
Rothschild Ditch – 2.0 cfs, 1887 priority
DeLaMatyr Ditch – 3.0 cfs, 1887 priority
Anderson and Hayes Ditch – 1.7 cfs, 1886 and 1887 priorities
Hayes Ditch – 1.5 cfs, 1887 priority

BLM's understanding is that return flows from all of the ditches listed above accrue to the creek.

In addition, BLM understands there are water rights on lower Roan Creek that are senior in priority to all of the ditches on the Dry Fork, so the ditches on the Dry Fork may be precluded from diverting during dry periods.

Relationship to Land Management Plans. Common goals, objectives, and management actions focused on management of water resource values identified in the Grand Junction Field Office draft Resource Management Plan include:

1. Protection, preservation, and enhancement of watershed functions in the capture, retention, and release of water in quantity, quality, and time to meet ecosystem and human needs. (Goal)
2. Provide sufficient water quantity on BLM lands for multiple use management and functioning, healthy riparian, wetland, aquatic, and upland systems. (objective)
3. Ensure streams on BLM lands are in geomorphic balance (e.g. stream channel size, sinuosity, slope, and substrate are appropriate for its landscape setting and geology) with the water and sediment being supplied by the watershed (e.g., no accelerated erosion, deposition, or head-cutting) and ensure that the land used does not impeded the natural hydrograph(e.g., allows timing, magnitude and duration of peak, high and low flow events by minimizing surface disturbance, erosion, and sedimentation of streams). (objective)
4. Make recommendations to the Colorado Water Conservation Board for protection and/or enlargement of in-stream flows on appropriate stream segments that cross BLM lands. (management action).

Appropriation of an instream flow water right would assist BLM in long-term management of riparian values and fishery values.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section were included with BLM's draft recommendation in February 2013. We thank both Colorado Parks and Wildlife and the Colorado Water Conservation Board for their cooperation in this effort.

If you have any questions regarding our instream flow recommendation, please contact Roy Smith at 303-239-3940.

Sincerely,

Leigh Espy
Deputy State Director
Resources and Fire

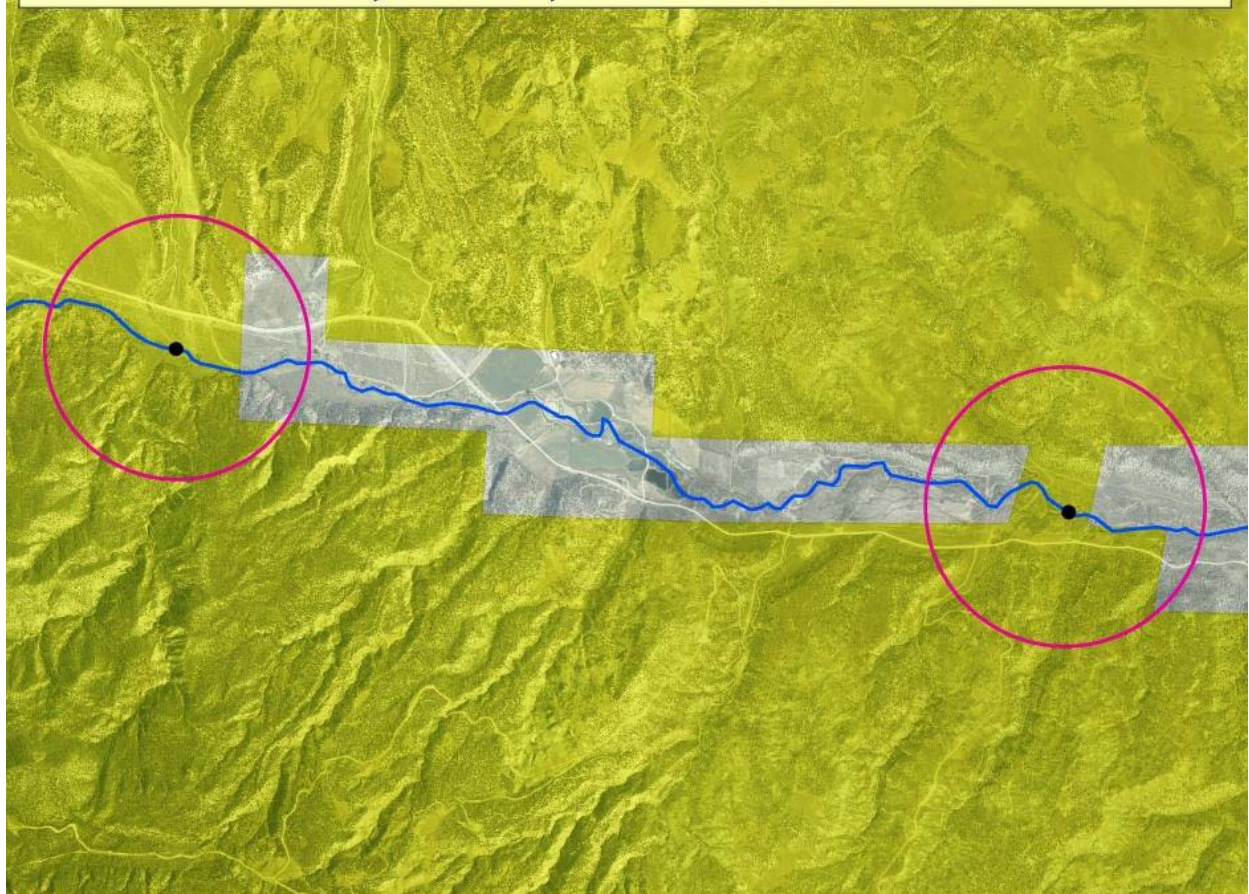
Cc: Catherine Robertson, Grand Junction FO
Nate Dieterich, Grand Junction FO

Grand Junction Field Office Stream Surveys April 2012

Dry Fork Creek - Water Code #23898

Dry Fork Creek, located northwest of DeBeque, Colorado on lands managed by the BLM's Grand Junction Field Office, was sampled on April 13, 2012. Dry Fork Creek is tributary to Roan Creek and then the Colorado River. Two sites were sampled using 1 backpack electroshocker. A two-pass removal population estimate was conducted at the lower of the two sites. No fish were collected or seen at the upper site. Sampling was conducted to determine fish species composition and to look specifically for spring spawning use of the creek by select native fish (flannemouth suckers, bluehead suckers, and roundtail chubs). Personnel present included Tom Fresques, and Faith Dziedzic BLM, and Jenn Logan, Kevin Thompson, and their crew, Colorado Parks and Wildlife.

Sample Sites on Dry Fork Creek 4-13-2012 T8S, R98W, Sections 9 & 12





Lower Site



Brook stickleback



Fathead minnow



Speckled dace



Bullfrog



Upper sample site



Upper Sample Site

Discussion:

Two sites on Dry Fork Creek were sampled. Native speckled dace and nonnative fathead minnow and brook stickleback were collected at the lower site as were native northern leopard frogs and nonnative bullfrogs. No fish were seen or captured at the upper site despite better flow and habitat. Water diversions appear to effect flow regimes in select stream segments. This was a very dry year and flow was limited. It could be that on good flow years the stream is used seasonally by other native fishes.

Riparian vegetation at the lower site consisted of tamarisk, cottonwoods, willow, and limited sedges. Stream habitat was fair with limited shallow pools and mostly small run and riffle habitats. Substrate was primarily cobble covered with silt and sands.

Riparian vegetation at the upper site consisted of canary reedgrass, scattered willows, and some sedge and rush. Stream habitat was mostly longer runs with some deeper pools and limited riffles. Fine sediments were abundant. Flows were better here but no fish were collected or seen. It is possible that a barrier to upstream fish movement exists between the lower and upper site on private lands but no obvious barriers were observed and it could just be diversion structures and/or low flows.

Recommendations:

- Consider sampling at other times of year and on a good water year to see if there is increased use by select native fishes
- Determine the extent of the northern leopard frog/bullfrog populations



LOCATION INFORMATION



STREAM NAME: Dry Fork Roan Creek		CROSS-SECTION NO.: 1	
CROSS-SECTION LOCATION: 1.25 miles downstream from conf. w/ South Dry Fk.			
DATE: 5-15-12		OBSERVERS: R. Smith, N. Diederich	
LEGAL DESCRIPTION	1/4 SECTION: SE NW	SECTION: 9	TOWNSHIP: 8 N (S)
			RANGE: 98 E (W)
COUNTY: Garfield	WATERSHED: Roan Ck	WATER DIVISION: 5	DOW WATER CODE: 21701
MAP(S):	USGS: NAD 83	0729723	
	USFS: Zone 12S	4361901	

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO		METER TYPE: M-M	
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: _____ lbs/foot
CHANNEL BED MATERIAL SIZE RANGE: gravel to 4" cobbles		PHOTOGRAPHS TAKEN: YES/NO	TAPE TENSION: _____ lbs

CHANNEL PROFILE DATA

STATION		DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗	Tape @ Stake LB	0.0	Surveyed
⊗	Tape @ Stake RB	0.0	Surveyed
①	WS @ Tape LB/RB	0.0	8.42/8.42
②	WS Upstream	40.0	8.85
③	WS Downstream	73.0	7.50
SLOPE	1.35 / 113.0 =		

SKETCH

LEGEND:

Stake ⊗

Station ①

Photo ① →

Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED: _____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO														
LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)																	
SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

may fly, caddisfly

COMMENTS

Ph = 8.46
Temp = 15.3°C
Cond = 2714 μ S
Salinity = 1.5 ppt

DISCHARGE/CROSS SECTION NOTES

[illegible]

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Dry Fork Roan Creek
XS LOCATION: 1.25 mi fs fr conf w/ S. Dry Fork
XS NUMBER: 1

DATE: 15-May-12
OBSERVERS: R. Smith, N. Dieterich

1/4 SEC: SE NW
SECTION: 9
TWP: 8S
RANGE: 98W
PM: Sixth

COUNTY: Garfield
WATERSHED: Roan Creek
DIVISION: 4
DOW CODE: 21701

USGS MAP: 0
USFS MAP: 0

SUPPLEMENTAL DATA

*** NOTE ***

Leave TAPE WT and TENSION
at defaults for data collected
with a survey level and rod

TAPE WT: 0.0106
TENSION: 99999

CHANNEL PROFILE DATA

SLOPE: 0.0119

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Dry Fork Roan Creek
 XS LOCATION: 1.25 mi fs fr conf w/ S. Dry Fork
 XS NUMBER: 1

DATA POINTS= 26

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 LS & G	0.70	6.76		
	1.00	7.17		
	2.00	7.88		
	2.50	8.33		
W	2.90	8.42	0.00	0.00
	3.20	8.52	0.10	0.58
	3.50	8.62	0.20	0.95
	3.80	8.67	0.25	1.08
	4.10	8.67	0.25	1.27
	4.40	8.67	0.25	1.25
	4.70	8.67	0.25	1.17
	5.00	8.62	0.20	1.10
	5.30	8.57	0.15	1.03
	5.60	8.62	0.20	1.23
	5.90	8.67	0.25	1.21
	6.20	8.57	0.15	1.08
	6.50	8.52	0.10	0.63
	6.80	8.57	0.15	0.00
	7.10	8.52	0.10	0.00
	7.40	8.52	0.10	0.00
W	7.60	8.42	0.00	0.00
	8.00	8.29		
	8.40	7.20		
1 G	9.00	6.73		
	10.00	6.56		
RS	11.30	5.99		

WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.32	0.10	0.03	0.02	2.2%
0.32	0.20	0.06	0.06	7.3%
0.30	0.25	0.08	0.08	10.4%
0.30	0.25	0.08	0.10	12.3%
0.30	0.25	0.08	0.09	12.1%
0.30	0.25	0.08	0.09	11.3%
0.30	0.20	0.06	0.07	8.5%
0.30	0.15	0.05	0.05	6.0%
0.30	0.20	0.06	0.07	9.5%
0.30	0.25	0.08	0.09	11.7%
0.32	0.15	0.05	0.05	6.3%
0.30	0.10	0.03	0.02	2.4%
0.30	0.15	0.05	0.00	0.0%
0.30	0.10	0.03	0.00	0.0%
0.30	0.10	0.03	0.00	0.0%
0.22		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

TOTALS -----

4.81 0.25 0.81 0.78 100.0%
 (Max.)

Manning's n = 0.0511
 Hydraulic Radius= 0.16752004

STREAM NAME: Dry Fork Roan Creek
 XS LOCATION: 1.25 mi fs fr conf w/ S. Dry Fork
 XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	0.81	0.81	0.0%
8.17	0.81	2.15	167.4%
8.19	0.81	2.04	153.3%
8.21	0.81	1.93	139.2%
8.23	0.81	1.81	125.1%
8.25	0.81	1.70	111.2%
8.27	0.81	1.59	97.3%
8.29	0.81	1.48	83.5%
8.31	0.81	1.37	69.8%
8.33	0.81	1.26	56.3%
8.35	0.81	1.15	43.2%
8.37	0.81	1.05	30.4%
8.38	0.81	1.00	24.1%
8.39	0.81	0.95	17.9%
8.40	0.81	0.90	11.9%
8.41	0.81	0.85	5.9%
8.42	0.81	0.81	0.0%
8.43	0.81	0.76	-5.8%
8.44	0.81	0.71	-11.6%
8.45	0.81	0.67	-17.2%
8.46	0.81	0.62	-22.9%
8.47	0.81	0.58	-28.4%
8.49	0.81	0.49	-39.3%
8.51	0.81	0.40	-50.0%
8.53	0.81	0.32	-60.0%
8.55	0.81	0.25	-68.6%
8.57	0.81	0.19	-76.2%
8.59	0.81	0.14	-82.9%
8.61	0.81	0.09	-88.6%
8.63	0.81	0.05	-93.4%
8.65	0.81	0.02	-97.2%
8.67	0.81	0.00	-100.0%

WATERLINE AT ZERO

AREA ERROR = 8.420

STREAM NAME: Dry Fork Roan Creek
 XS LOCATION: 1.25 mi fs fr conf w/ S. Dry Fork
 XS NUMBER: 1

Constant Manning's n

GL = lowest Grassline elevation corrected for sag

STAGING TABLE

WL = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.76	8.26	1.44	1.91	11.91	9.92	100.0%	1.20	42.70	3.59
	7.42	6.97	0.99	1.25	6.89	8.03	81.0%	0.86	19.76	2.87
	7.47	6.88	0.95	1.20	6.55	7.89	79.6%	0.83	18.34	2.80
	7.52	6.79	0.91	1.15	6.20	7.75	78.2%	0.80	16.98	2.74
	7.57	6.70	0.88	1.10	5.87	7.61	76.7%	0.77	15.66	2.67
	7.62	6.61	0.84	1.05	5.53	7.47	75.3%	0.74	14.38	2.60
	7.67	6.52	0.80	1.00	5.21	7.33	73.9%	0.71	13.15	2.53
	7.72	6.43	0.76	0.95	4.88	7.19	72.5%	0.68	11.97	2.45
	7.77	6.35	0.72	0.90	4.56	7.05	71.1%	0.65	10.83	2.37
	7.82	6.26	0.68	0.85	4.25	6.91	69.7%	0.61	9.74	2.29
	7.87	6.17	0.64	0.80	3.94	6.77	68.3%	0.58	8.70	2.21
	7.92	6.09	0.60	0.75	3.63	6.64	67.0%	0.55	7.70	2.12
	7.97	6.02	0.55	0.70	3.33	6.52	65.7%	0.51	6.75	2.03
	8.02	5.94	0.51	0.65	3.03	6.39	64.4%	0.47	5.84	1.93
	8.07	5.87	0.47	0.60	2.73	6.26	63.1%	0.44	4.99	1.83
	8.12	5.80	0.42	0.55	2.44	6.13	61.8%	0.40	4.19	1.72
	8.17	5.72	0.38	0.50	2.15	6.00	60.5%	0.36	3.45	1.60
	8.22	5.65	0.33	0.45	1.87	5.87	59.2%	0.32	2.76	1.48
	8.27	5.57	0.28	0.40	1.59	5.75	57.9%	0.28	2.14	1.35
	8.32	5.42	0.24	0.35	1.31	5.55	56.0%	0.24	1.59	1.21
	8.37	5.08	0.21	0.30	1.05	5.19	52.4%	0.20	1.15	1.09
WL	8.42	4.70	0.17	0.25	0.80	4.81	48.5%	0.17	0.78	0.96
	8.47	4.45	0.13	0.20	0.58	4.54	45.7%	0.13	0.46	0.80
	8.52	3.90	0.09	0.15	0.36	3.97	40.0%	0.09	0.23	0.64
	8.57	2.85	0.07	0.10	0.19	2.90	29.2%	0.07	0.10	0.52
	8.62	1.95	0.04	0.05	0.07	1.97	19.9%	0.04	0.02	0.35
	8.67	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: Dry Fork Roan Creek
XS LOCATION: 1.25 mi fs fr conf w/ S. Dry Fork
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)= 0.78 cfs
CALCULATED FLOW (Qc)= 0.78 cfs
(Qm-Qc)/Qm * 100 = 0.0 %

MEASURED WATERLINE (WLm)= 8.42 ft
CALCULATED WATERLINE (WLc)= 8.42 ft
(WLm-WLc)/WLm * 100 = 0.0 %

MAX MEASURED DEPTH (Dm)= 0.25 ft
MAX CALCULATED DEPTH (Dc)= 0.25 ft
(Dm-Dc)/Dm * 100 = 0.0 %

MEAN VELOCITY= 0.96 ft/sec
MANNING'S N= 0.051
SLOPE= 0.0119 ft/ft

.4 * Qm = 0.3 cfs
2.5 * Qm= 1.9 cfs

RECOMMENDED INSTREAM FLOW:
=====

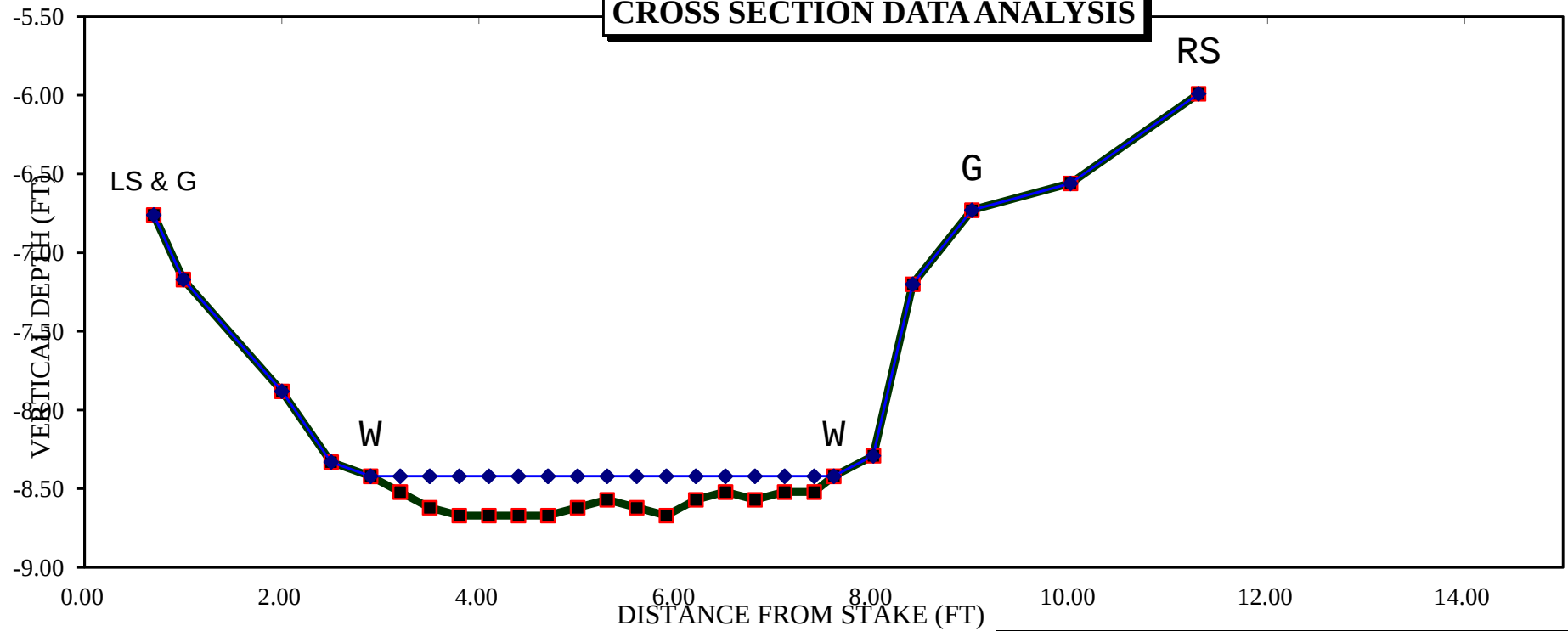
FLOW (CFS)	PERIOD
=====	=====
_____	_____
_____	_____
_____	_____
_____	_____

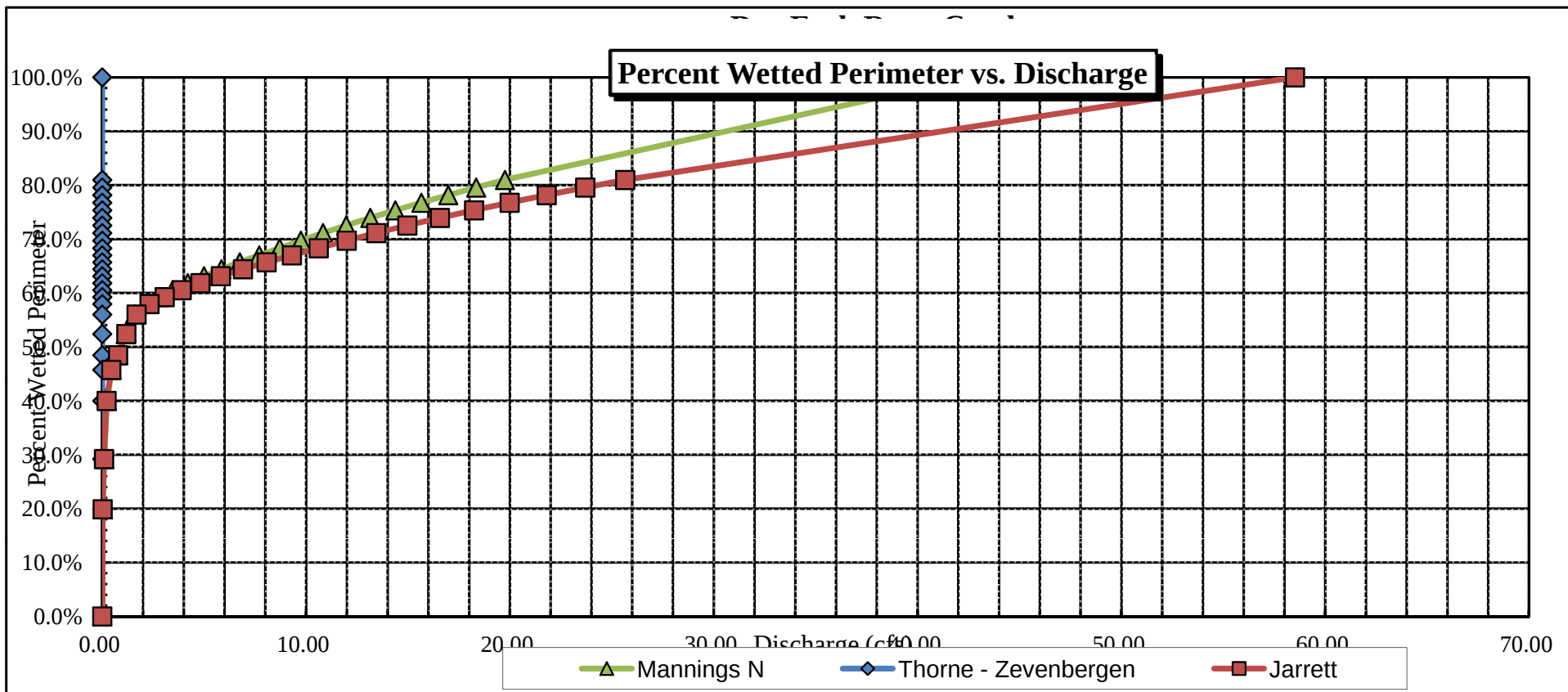
RATIONALE FOR RECOMMENDATION:
=====

RECOMMENDATION BY: AGENCY..... DATE:.....
CWCB REVIEW BY: DATE:.....

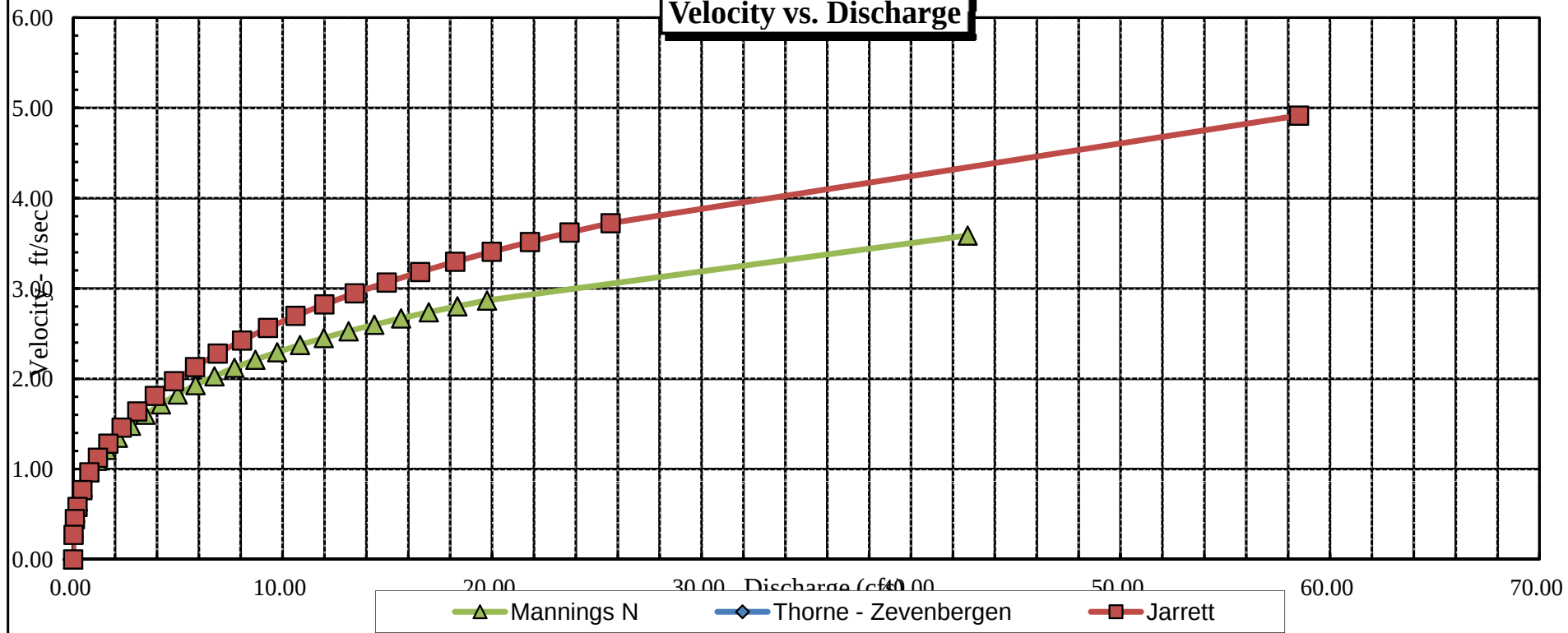
D E F G H

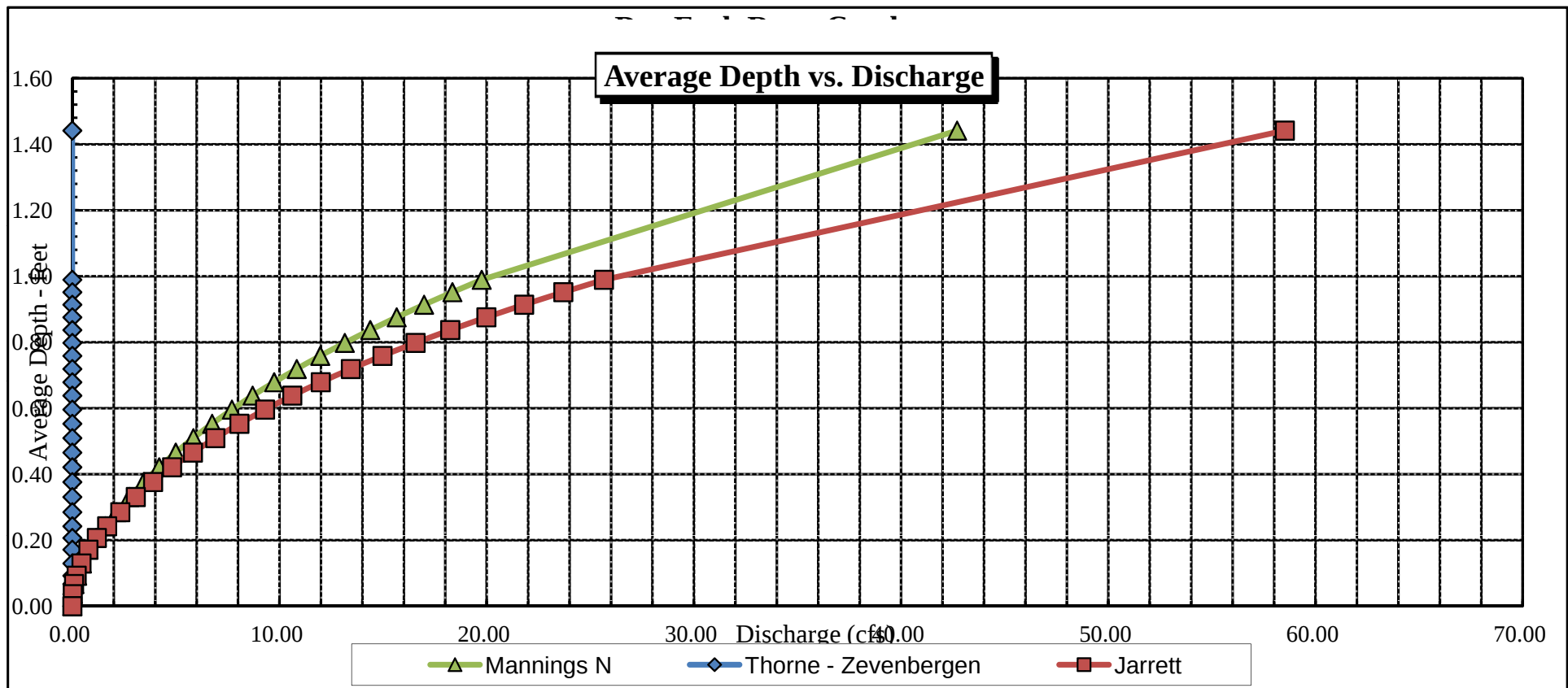
CROSS SECTION DATA ANALYSIS



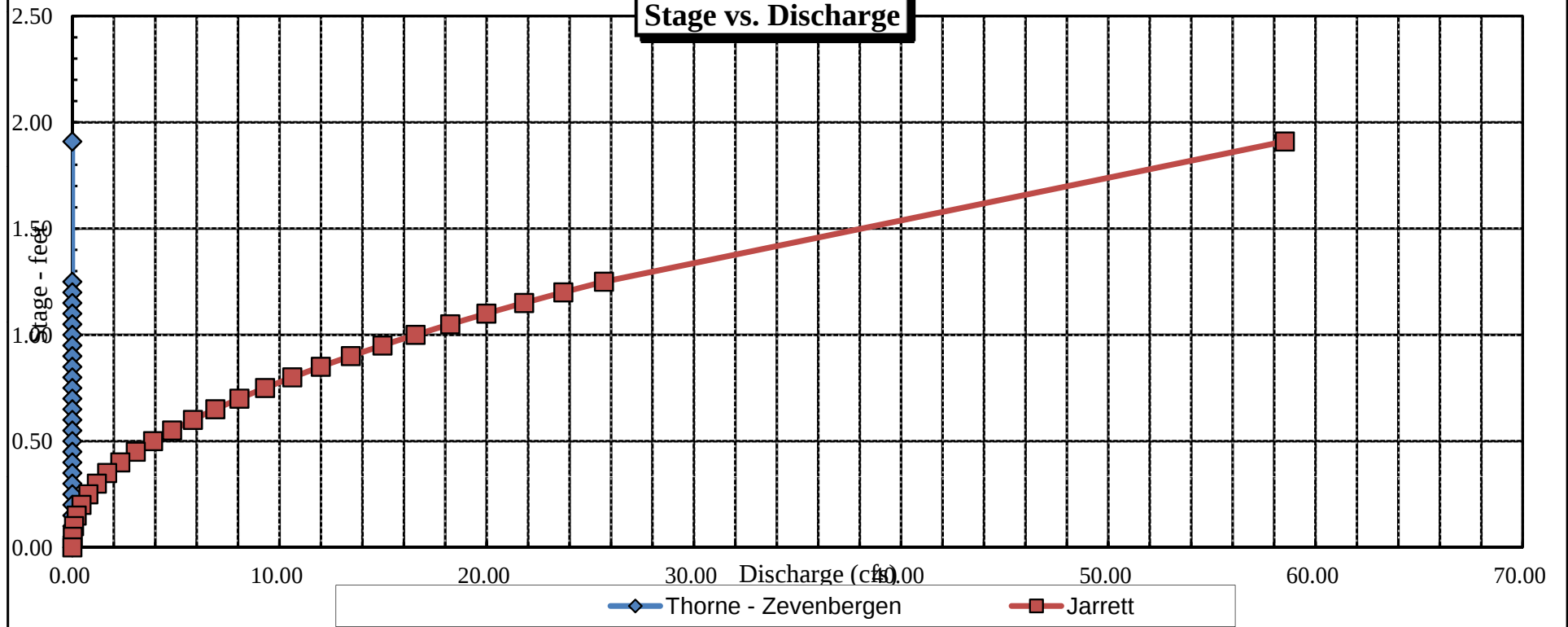


Velocity vs. Discharge





Stage vs. Discharge





COLORADO WATER
CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



LOCATION INFORMATION

STREAM NAME: <u>Dry Fork Roan Creek</u>		CROSS-SECTION NO.: <u>2</u>
CROSS-SECTION LOCATION: <u>1.25 miles downstream from confluence with South Dry Fork</u>		
DATE: <u>5-15-12</u>	OBSERVERS: <u>R. Smith, N. Dieterich</u>	
LEGAL DESCRIPTION:	1/4 SECTION: <u>SE NW</u>	SECTION: <u>9</u>
	TOWNSHIP: <u>8 N/S</u>	RANGE: <u>98 E/W</u>
COUNTY: <u>Garfield</u>	WATERSHED: <u>Roan Cr.</u>	WATER DIVISION: <u>5</u>
		DOW WATER CODE: <u>21701</u>
MAP(S):	USGS:	USFS:

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION:	YES / NO	METER TYPE: <u>M-M</u>
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec
		TAPE WEIGHT: <u>surveyed</u> lbs/foot
		TAPE TENSION: <u>surveyed</u> lbs
CHANNEL BED MATERIAL SIZE RANGE: <u>gravel to 4" cobbles</u>	PHOTOGRAPHS TAKEN: <u>(3)</u>	NUMBER OF PHOTOGRAPHS: <u>3</u>

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	<u>surveyed</u>
⊗ Tape @ Stake RB	0.0	<u>surveyed</u>
① WS @ Tape LB/RB	0.0	<u>7.97/7.98</u>
② WS Upstream	<u>36</u>	<u>6.99</u>
③ WS Downstream	<u>46</u>	<u>8.42</u>
SLOPE	<u>1.43 / 82.0 = .0174</u>	

SKETCH

TAPE

7.36 - bed

①

LEGEND:

Stake ⊗

Station ①

Photo ◇

Direction of Flow →

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO <u>(NO)</u>	DISTANCE ELECTROFISHED: _____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO <u>(YES)</u>														
LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)																	
SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL
AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:																	
<u>mayfly, caddisfly</u>																	

COMMENTS

<u>pH = 8.46</u>	<u>Willow - Cottonwood</u>
<u>Temp = 15.3°C</u>	<u>riparian</u>
<u>Cond = 2714 uS</u>	
<u>Salinity = 1.5 ppt</u>	

[illegible][illegible]

COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Dry Fork Roan Creek
XS LOCATION: 1.25 mi ds fr conf w S. Dry Fork
XS NUMBER: 2

DATE: 15-May-12
OBSERVERS: R. Smith, N. Dieterich

1/4 SEC: SE NW
SECTION: 9
TWP: 8S
RANGE: 98W
PM: Sixth

COUNTY: Garfield
WATERSHED: Roan Creek
DIVISION: 5
DOW CODE: 21701

USGS MAP: 0
USFS MAP: 0

SUPPLEMENTAL DATA

*** NOTE ***

Leave TAPE WT and TENSION
at defaults for data collected
with a survey level and rod

TAPE WT: 0.0106
TENSION: 99999

CHANNEL PROFILE DATA

SLOPE: 0.0174

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Dry Fork Roan Creek
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 XS NUMBER: 2

DATA POINTS= 23

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
LS	0.00	5.56		
1 G	1.10	6.32		
	1.50	6.95		
W	1.80	7.97	0.00	0.00
	2.10	8.12	0.15	0.26
	2.40	8.12	0.15	1.16
	2.70	8.07	0.10	0.68
	3.00	8.22	0.25	1.38
	3.30	8.22	0.25	1.87
	3.60	8.22	0.25	1.29
	3.90	8.22	0.25	2.04
	4.20	8.17	0.20	1.67
	4.50	8.17	0.20	1.83
	4.80	8.12	0.15	1.68
	5.10	8.07	0.10	0.89
	5.40	8.07	0.10	0.91
	5.70	8.12	0.15	0.61
W	5.80	7.98	0.00	0.00
	6.00	7.53		
	7.00	6.82		
1 G	8.00	6.39		
	8.20	5.29		
RS	8.90	4.91		

WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.34	0.15	0.05	0.01	1.3%
0.30	0.15	0.05	0.05	5.6%
0.30	0.10	0.03	0.02	2.2%
0.34	0.25	0.08	0.10	11.1%
0.30	0.25	0.08	0.14	15.0%
0.30	0.25	0.08	0.10	10.3%
0.30	0.25	0.08	0.15	16.4%
0.30	0.20	0.06	0.10	10.7%
0.30	0.20	0.06	0.11	11.7%
0.30	0.15	0.05	0.08	8.1%
0.30	0.10	0.03	0.03	2.9%
0.30	0.10	0.03	0.03	2.9%
0.30	0.15	0.03	0.02	2.0%
0.17		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

TOTALS -----

4.16	0.25	0.68	0.94	100.0%
(Max.)				

Manning's n = 0.0420
 Hydraulic Radius= 0.16212097

STREAM NAME: Dry Fork Roan Creek
 XS LOCATION: 1.25 mi ds fr conf w S. Dry Fork
 XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	0.68	0.66	-2.9%
7.73	0.68	1.68	148.7%
7.75	0.68	1.60	136.3%
7.77	0.68	1.51	124.0%
7.79	0.68	1.43	111.7%
7.81	0.68	1.35	99.5%
7.83	0.68	1.26	87.2%
7.85	0.68	1.18	75.1%
7.87	0.68	1.10	63.0%
7.89	0.68	1.02	50.9%
7.91	0.68	0.94	38.9%
7.93	0.68	0.86	26.9%
7.94	0.68	0.82	20.9%
7.95	0.68	0.78	14.9%
7.96	0.68	0.74	9.0%
7.97	0.68	0.70	3.0%
7.98	0.68	0.66	-2.9%
7.99	0.68	0.62	-8.8%
8.00	0.68	0.58	-14.6%
8.01	0.68	0.54	-20.5%
8.02	0.68	0.50	-26.2%
8.03	0.68	0.46	-32.0%
8.05	0.68	0.38	-43.3%
8.07	0.68	0.31	-54.5%
8.09	0.68	0.24	-64.5%
8.11	0.68	0.18	-73.0%
8.13	0.68	0.14	-80.0%
8.15	0.68	0.10	-85.6%
8.17	0.68	0.06	-90.7%
8.19	0.68	0.04	-94.6%
8.21	0.68	0.01	-97.9%
8.23	0.68	0.00	-100.0%

WATERLINE AT ZERO

AREA ERROR = 7.970

STREAM NAME: Dry Fork Roan Creek
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 XS NUMBER: 2

Constant Manning's n

GL = lowest Grassline elevation corrected for sag

STAGING TABLE

WL = Waterline corrected for variations in field measured water surface elevations and sag

	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	6.39	6.86	1.27	1.83	8.69	8.70	100.0%	1.00	40.49	4.66
	6.97	5.28	0.98	1.25	5.20	6.67	76.6%	0.78	20.55	3.95
	7.02	5.20	0.95	1.20	4.94	6.53	75.0%	0.76	19.11	3.87
	7.07	5.11	0.92	1.15	4.68	6.39	73.5%	0.73	17.73	3.79
	7.12	5.03	0.88	1.10	4.43	6.25	71.9%	0.71	16.40	3.70
	7.17	4.94	0.85	1.05	4.18	6.11	70.3%	0.68	15.11	3.62
	7.22	4.86	0.81	1.00	3.93	5.97	68.7%	0.66	13.88	3.53
	7.27	4.77	0.77	0.95	3.69	5.83	67.1%	0.63	12.69	3.44
	7.32	4.69	0.74	0.90	3.46	5.70	65.5%	0.61	11.54	3.34
	7.37	4.60	0.70	0.85	3.22	5.56	63.9%	0.58	10.45	3.24
	7.42	4.52	0.66	0.80	2.99	5.42	62.3%	0.55	9.40	3.14
	7.47	4.43	0.63	0.75	2.77	5.28	60.7%	0.52	8.41	3.03
	7.52	4.35	0.59	0.70	2.55	5.14	59.1%	0.50	7.46	2.92
	7.57	4.30	0.54	0.65	2.34	5.03	57.8%	0.46	6.53	2.80
	7.62	4.26	0.50	0.60	2.12	4.92	56.6%	0.43	5.65	2.66
	7.67	4.23	0.45	0.55	1.91	4.82	55.4%	0.40	4.81	2.52
	7.72	4.19	0.41	0.50	1.70	4.71	54.1%	0.36	4.02	2.36
	7.77	4.15	0.36	0.45	1.49	4.60	52.9%	0.32	3.28	2.20
	7.82	4.12	0.31	0.40	1.28	4.49	51.7%	0.29	2.60	2.02
	7.87	4.08	0.26	0.35	1.08	4.39	50.4%	0.25	1.97	1.83
	7.92	4.04	0.22	0.30	0.88	4.28	49.2%	0.20	1.42	1.62
WL	7.97	4.00	0.17	0.25	0.67	4.17	48.0%	0.16	0.93	1.38
	8.02	3.87	0.12	0.20	0.48	4.00	46.0%	0.12	0.54	1.13
	8.07	3.43	0.08	0.15	0.29	3.53	40.5%	0.08	0.25	0.88
	8.12	2.00	0.07	0.10	0.14	2.03	23.3%	0.07	0.12	0.80
	8.17	1.30	0.04	0.05	0.05	1.31	15.1%	0.04	0.03	0.56

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SUMMARY SHEET

MEASURED FLOW (Qm)= 0.94 cfs
CALCULATED FLOW (Qc)= 0.93 cfs
(Qm-Qc)/Qm * 100 = 0.2 %

MEASURED WATERLINE (WLm)= 7.98 ft
CALCULATED WATERLINE (WLc)= 7.97 ft
(WLm-WLc)/WLm * 100 = 0.1 %

MAX MEASURED DEPTH (Dm)= 0.25 ft
MAX CALCULATED DEPTH (Dc)= 0.25 ft
(Dm-Dc)/Dm * 100 = 0.1 %

MEAN VELOCITY= 1.38 ft/sec
MANNING'S N= 0.042
SLOPE= 0.0174 ft/ft

.4 * Qm = 0.4 cfs
2.5 * Qm= 2.3 cfs

RECOMMENDED INSTREAM FLOW:
=====

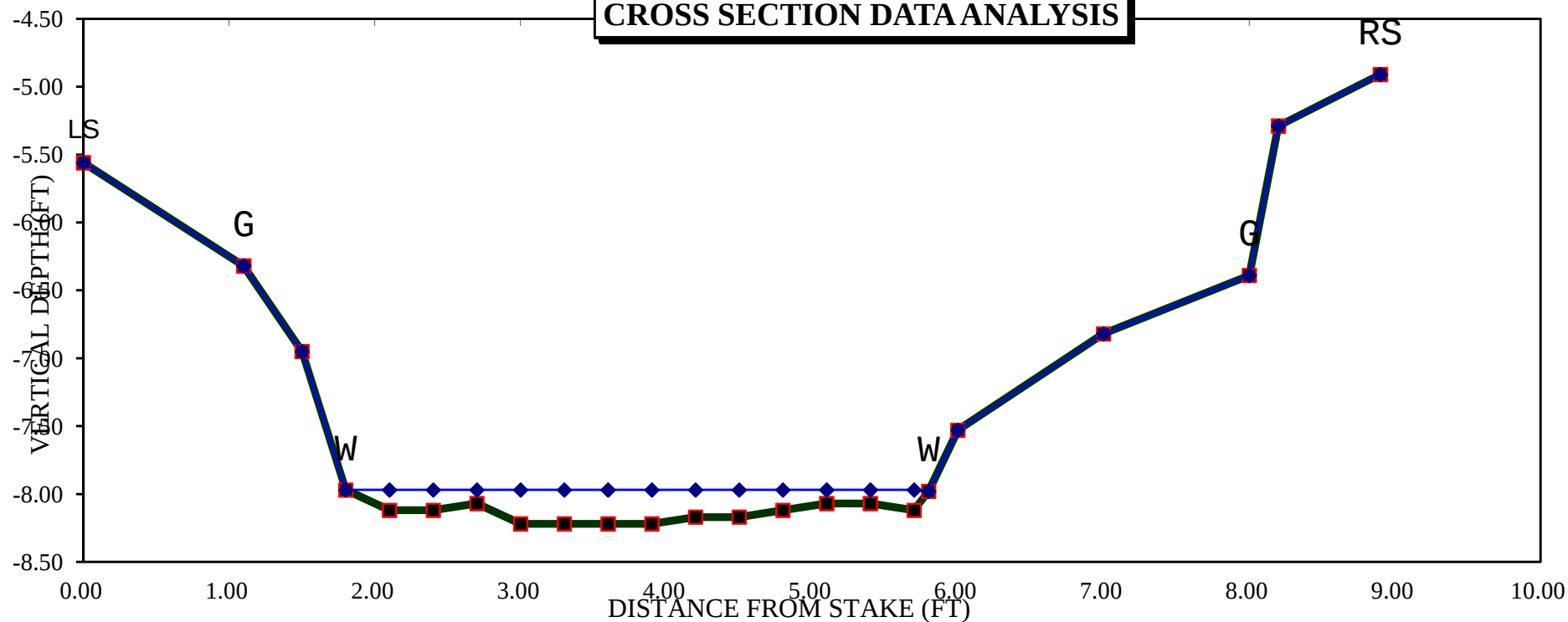
FLOW (CFS)	PERIOD
=====	=====
_____	_____
_____	_____
_____	_____
_____	_____

RATIONALE FOR RECOMMENDATION:
=====

RECOMMENDATION BY: AGENCY..... DATE:.....
CWCB REVIEW BY: DATE:.....

D E F G H

CROSS SECTION DATA ANALYSIS



RS

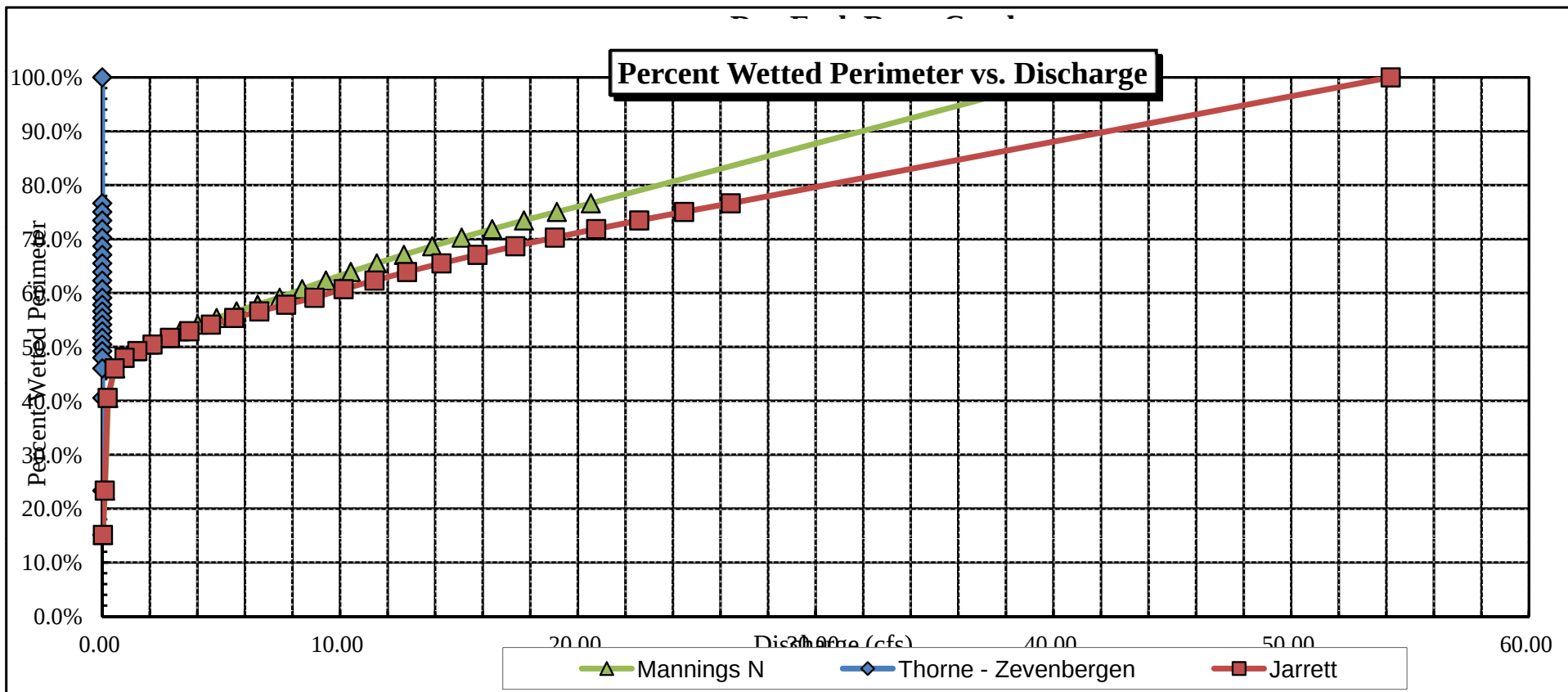
LS

G

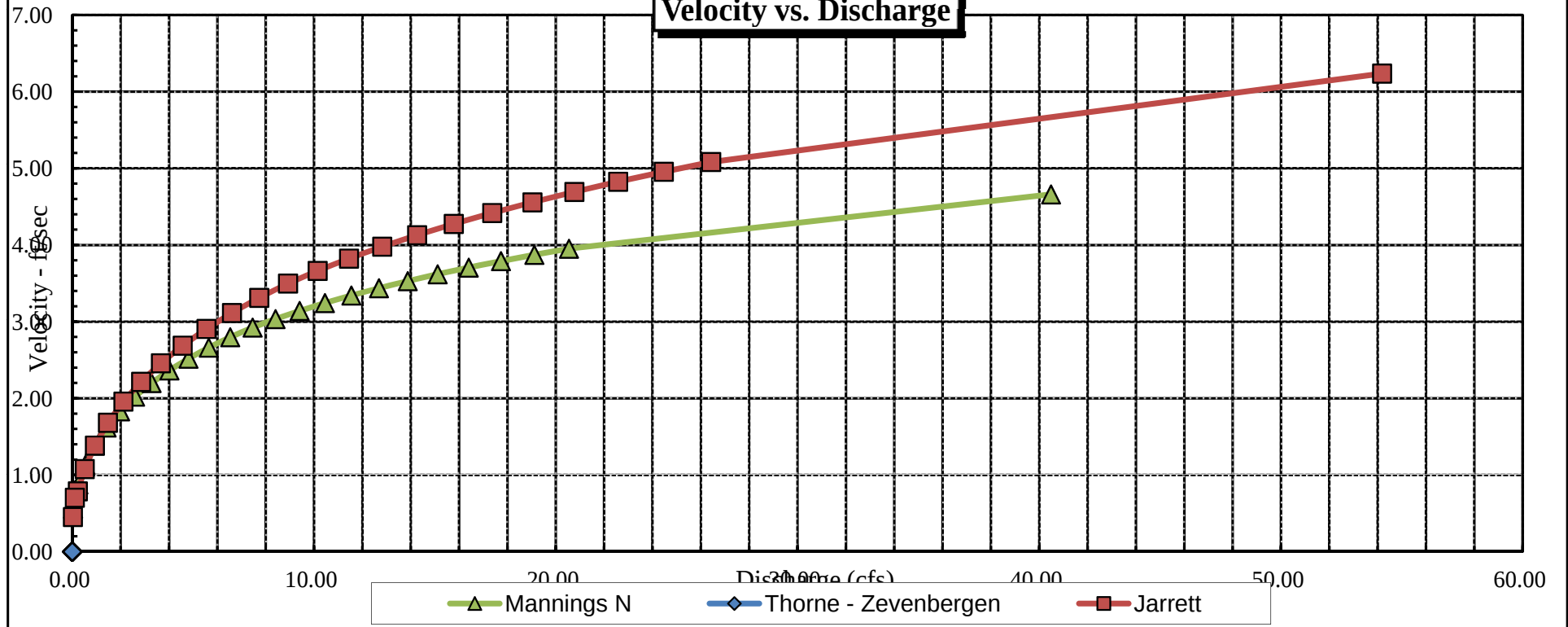
W

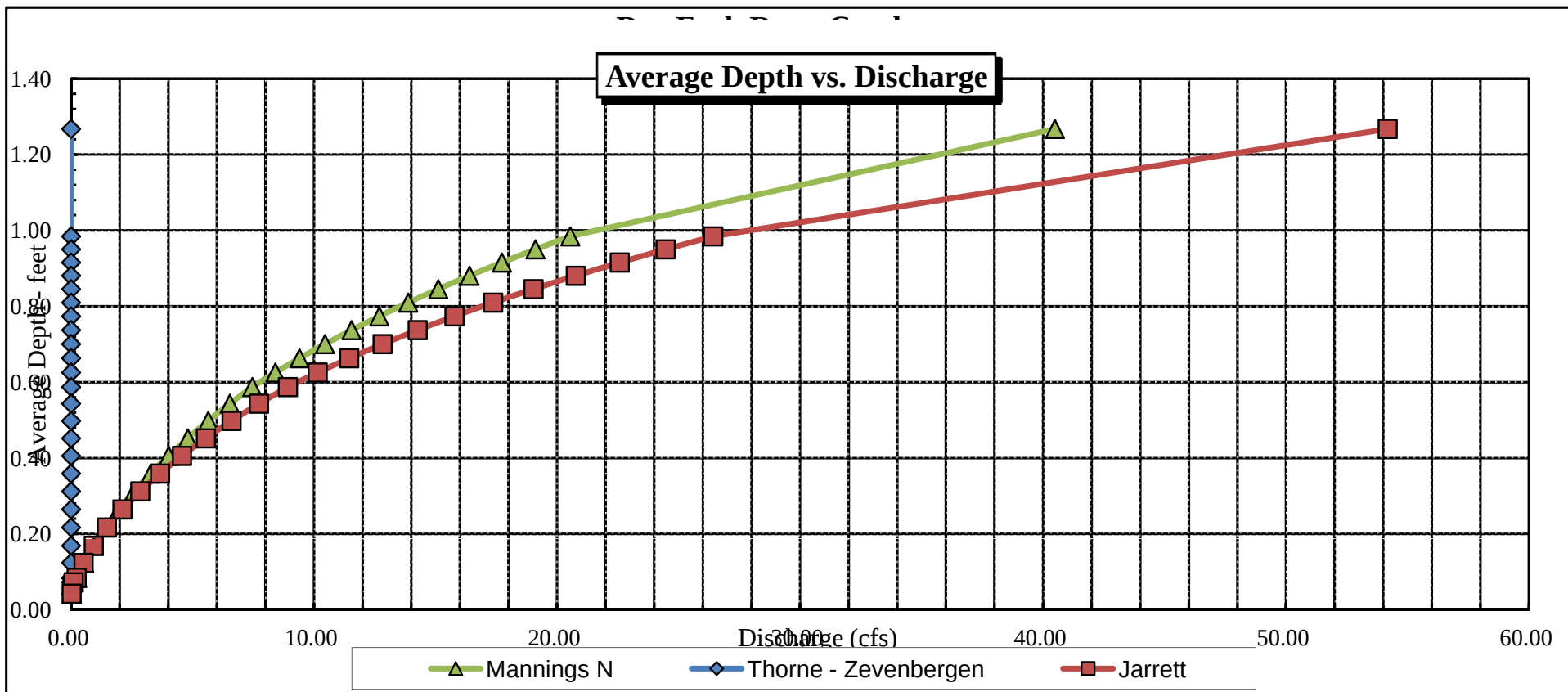
W

G



Velocity vs. Discharge





Stage vs. Discharge

