COLORADO PARKS & WILDLIFE

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December 30, 2013

Ms. Linda Bassi
Colorado Water Conservation Board
Stream and Lake Protection Section
1313 Sherman Street, Room 723
Denver, Colorado 80203

Re: Colorado Parks and Wildlife Instream Flow Recommendations for Beaver Dam Creek – Garfield County

Dear Linda,

The purpose of this letter is to formally transmit Colorado Parks and Wildlife's (CPW) Instream Flow Recommendations for Beaver Dam Creek. CPW has collected and reviewed data, including stream cross section information and natural environment data, needed to quantify the instream flow requirements for this reach of Beaver Dam Creek. CPW has conducted a preliminary evaluation of the stream hydrology and has subsequently consulted with CWCB staff where we reviewed their water availability analysis to determine if water is physically available for an instream flow appropriation. Beaver Dam Creek should be considered for inclusion in the Instream Flow Program (ISFP) because CPW is of the opinion that it has a natural environment that can be preserved to a reasonable degree with an instream flow water right.

The State of Colorado's ISFP was created in 1973 when the Colorado General Assembly recognized "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (See §37-92-102 (3) C.R.S.). The statute vests the Colorado Water Conservation Board (Board) with the exclusive authority to appropriate and acquire instream flow and natural lake level water rights. In order to encourage other entities to participate in Colorado's ISFP, the statute directs the Board to request instream flow recommendations from other state and federal agencies. CPW is recommending this segment of Beaver Dam Creek to the Board for inclusion into the ISFP.

CPW is forwarding this instream flow recommendation to the Board to meet Colorado's policy "… that the wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors … and that, to carry out such a program and policy, there shall be a continuous operation of planning, acquisition, and development of wildlife habitats and facilities for

wildlife-related opportunities" (See §33-1-101 (1) C.R.S.). CPW's Strategic Plan goes on to state that "[h]ealthy aquatic environments are essential to maintain healthy and viable fisheries, and critical for self-sustaining populations… by protecting and enhancing the quality and quantity of aquatic habitats." CPW has long been of the opinion that the ISFP is a critical habitat protection program for the water dependant natural environment.

The information contained in the attached report forms the basis for the instream flow recommendation to be considered by the Board. It is CPW staff's opinion that the information is sufficient for the Board to support the findings required in the ISFP statutes and in Rule 5 (i) of the Instream Flow Rules.

Natural Environment: This stream reach is important to CPW because it supports healthy naturally reproducing populations of Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*).

Initial Flow Recommendations: Initial CPW flow recommendations (prior to any water availability considerations) were 0.9 cfs for the summer months and 0.35 cfs for the winter months.

Final Flow Recommendations after Water Availability Consultations with CWCB Staff: After meeting with staff about the hydrology of Beaver Dam Creek, CPW has revised our flow recommendations to be (see attached report for rationale):

- 0.9 cfs (05/01 – 08/31)
- 0.35 cfs (09/01 – 10/31)
- 0.14 cfs (11/01 – 04/30)

If you have any questions regarding the attached information or the instream flow recommendations, please contact me at (303)-291-7260.

Sincerely,

Jay W. Skinner

Jay W. Skinner
Colorado Parks and Wildlife
Instream Flow Program Coordinator

cc: Chad Bishop, CPW Assistant Director – Wildlife and Natural Resources Branch
Alex Davis, CPW Water Resources Section Manager
Regional Staff

Stream: Beaver Dam Creek

Executive Summary

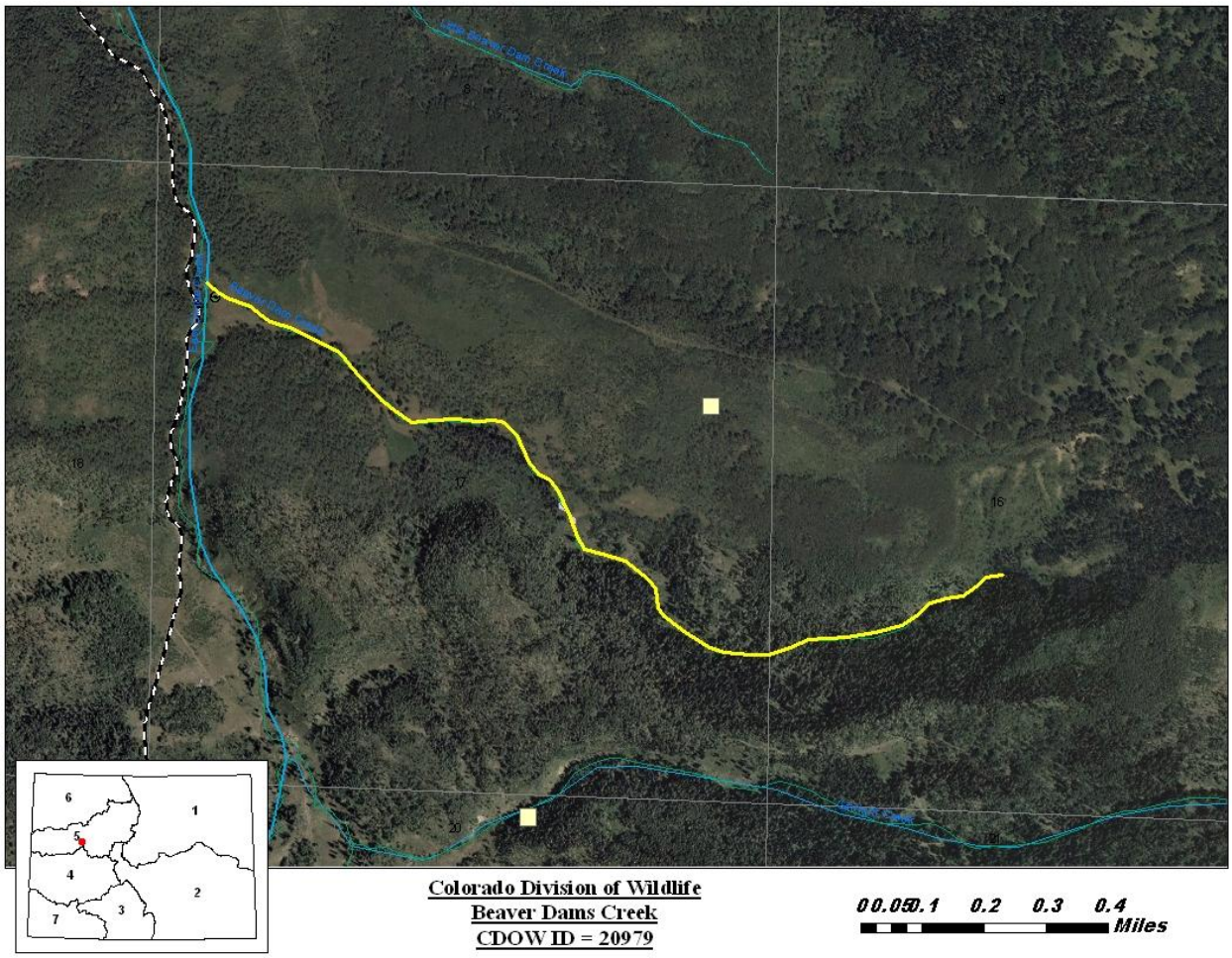
Water Division: 5
Water District: 45
CDOW#: 20979

Segment: Headwaters to East Divide Creek

Upper Terminus: Headwaters
Latitude: 39º 21’ 29.5”N Longitude: 107º 26’ 54.8"W

Lower Terminus: East Divide Creek
Latitude: 39º 21’ 51.8”N Longitude: 107º 28’ 22.2"W

ISF Appropriation: 0.9 cfs (05/01 – 08/31)
0.35 cfs (09/01 – 10/31)
0.14 cfs (11/01 - 04/30)



The information contained in this report and the associated instream flow file folder forms the basis for the instream flow recommendation to be considered by the Colorado Water Conservation Board (Board). The investigations related to this instream flow recommendation were initiated prior to the statutory merging of two divisions within the Colorado Department of Natural Resources; in 2011, the Division of Wildlife and the Division of Parks and Outdoor Recreation merged to form Colorado Parks and Wildlife (CPW). It is the CPW staff's opinion that the information contained in this report is sufficient for the Board's staff to initiate an instream flow appropriation and address the findings required in Rule 5(i) of the Instream Flow Rules.

The State of Colorado's Instream Flow Program (ISFP) was created in 1973 when the Colorado State Legislature recognized "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3) C.R.S.). The statute vests the Board with the exclusive authority to appropriate and acquire instream flow and natural lake level water rights. In order to encourage other entities to participate in Colorado's ISFP, the statute directs the Board to request instream flow recommendations from other state and federal agencies. The CPW is recommending this segment of Beaver Dam Creek to the Board for inclusion into the ISFP. Beaver Dam Creek should be considered for inclusion into the ISFP

because it has a natural environment that can be preserved to a reasonable degree with an instream flow water right.

The CPW is forwarding this stream flow recommendation to the Board to meet Colorado's policy "… that the wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors … and that, to carry out such program and policy, there shall be a continuous operation of planning, acquisition, and development of wildlife habitats and facilities for wildlife-related opportunities" (See §33-1-101 (1) C.R.S.). The CPW Strategic Plan states "[h]ealthy aquatic environments are essential to maintain healthy and viable fisheries, and critical for self-sustaining populations… by to protecting and enhancing the quality and quantity of aquatic habitats."

The subject of this report is a segment of Beaver Dam Creek beginning at the either the headwaters of Beaver Dam Creek or the outlet of Beaver Dam Creek Reservoir and extending downstream to the confluence with East Divide Creek. The proposed segment is located in Garfield County southeast of the Town of Silt. The recommendation for this segment is discussed below.

Instream Flow Recommendation(s)

The CPW is recommending 0.9 cfs summer, 0.35 cfs, for late summer and early fall, and 0.14 cfs, winter, based on the data collection efforts summarized below. This recommendation is based on the physical and biological data collected by CPW staff taking into account preliminary water availability constraints (discussed below).

- 0.9 cubic feet per second is the highest flow that can accurately be predicted by the R2CROSS data collected to date on Beaver Dams Creek and is recommended for the summer months (as a surrogate for a flow recommendation that meets all three hydraulic criteria);
- 0.35 cubic feet per second is required to maintain only two of the three principal hydraulic criteria - average depth and percent wetted perimeter. This is typically the winter period flow recommended but in this case is only available for the late summer/early fall time period. The average velocity criterion is not met at the cross section used for this recommendation;
- 0.14 cubic feet per second is required to maintain only one of the three principal hydraulic criteria and is driven by water availability constraints during the base flow season.

The modeling results from this survey effort are within the confidence interval produced by the R2CROSS model (see Table 1).

Land Status Review

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Beaver Dam Creek Reservoir	East Divide Creek	1.6	0%	100%

100% of the public lands are managed by the USFS.

Biological and Field Survey Data

In July of 2010 and again in July of 2011, CPW collected stream cross section information, natural environment data, and other data needed to quantify the instream flow needs for this reach of Beaver Dam Creek. Beaver Dam Creek is classified as a small stream (between 10 to 19 feet wide) and fishery surveys indicate the stream environment of Beaver Dam Creek supports Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*) (See CDOW Fish Survey in Appendix B).

Field Survey Data

CPW staff used the R2CROSS methodology to quantify the amount of water required to preserve the natural environment to a reasonable degree. The R2CROSS method requires that stream discharge and channel profile data be collected in a riffle stream habitat type. Riffles are most easily visualized, as the stream habitat type that would dry up first should streamflow cease. This type of hydraulic data collection consists of setting up a transect in a riffle or other type of hydraulic control, surveying the stream channel geometry, and measuring the stream discharge. Appendix B contains copies of field data collected for this proposed segment.

Biological Flow Recommendation

The Board staff relies upon the biological expertise of the cooperating agencies to interpret output from the R2CROSS data collected to develop the initial, biologic instream flow recommendation. This initial recommendation is designed to address the unique biologic requirements of each stream without regard to water availability. Three hydraulic parameters - average depth, percent wetted perimeter, and average velocity are used to develop biologic instream flow recommendations. The CDOW (Prior to the 2011 merger) determined that maintaining these three hydraulic parameters at adequate levels across riffle habitat types, aquatic habitat in pools and runs will also be maintained for most life stages of fish and aquatic invertebrates (Nehring 1979; Espegren 1996).

For this segment of stream, two data sets was collected; the results shown in Table 1 below. Table 1 shows who collected the data (Party), the date the data was collected, the measured discharge at the time of the survey (Q), the accuracy range of the predicted flows based on Manning's Equation (240% and 40% of Q), the summer flow recommendation based on meeting 3 of 3 hydraulic criteria and the winter flow recommendation based upon 2 of 3 hydraulic criteria.

Table 1: Data

Party	Date	Q	250%-40%	Summer (3/3)	Winter (2/3)
CDOW	7/8/2010	0.13	0.3 – 0.1	1.5^{R}	0.5^{R}
CDOW	7/21/2011	0.38	0.2 – 0.9	?	0.35

CDOW = Colorado Division of Wildlife

R = Outside of R2X Accuracy Range
? = Third criterion never met

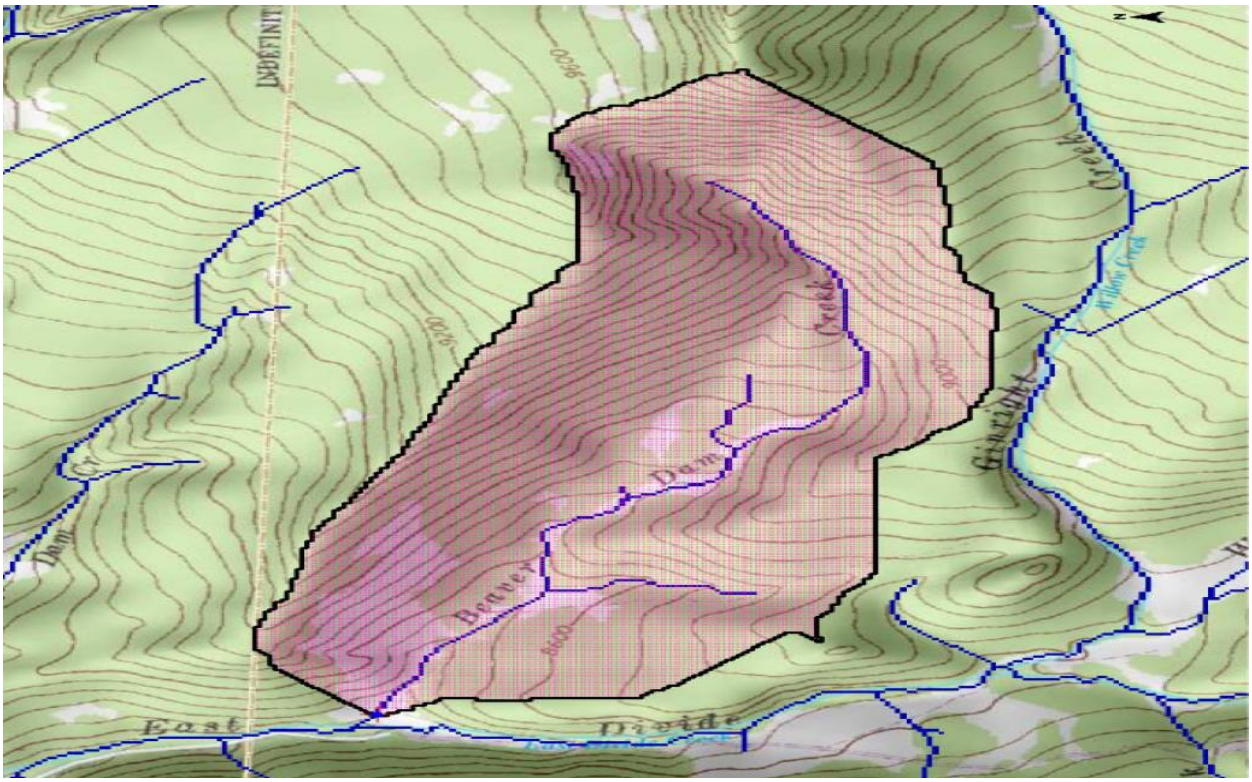
Biologic Flow Recommendation

The 2010 data collected on Beaver Dam Creek yielded a summer flow recommendation of 1.5 cfs which met 3 of 3 criteria. 1.5 cfs[1] is outside the accuracy range of the R2CROSS model. The winter flow recommendation which met 2 of 3 criteria is 0.5 cfs. 0.5 cfs[1] is also outside the accuracy range of the R2CROSS model (See Table 1). In 2011, CPW revisited Beaver Dams Creek to collect additional R2CROSS data in anticipation that "in range" flow recommendations could be developed. The 2011 data yielded only one "in range" flow recommendation so the upper extent of the R2CROSS modeling range is used as a summer flow recommendation and "2 of 3" flow of 0.35 cfs (the flow that meets only 2 criteria – average depth and percent wetted perimeter) is the low flow period flow recommendation. As discussed below, 0.35 cfs is only available for 2 months (September and October) and that the winter, base flow period is limited by water availability considerations. Thus, CPW's winter flow recommendation is 0.14 cfs – this flow meets and exceeds only one criterion – the percent wetted perimeter requirement but should be sufficient to minimally protect the over wintering fish population.

Hydrologic Data

The CPW staff conducted a preliminary evaluation of the stream hydrology to determine if water was physically available for an instream flow appropriation. The hydrograph below was derived from data collected by the USGS stream gage for West Divide Creek, near Raven, CO (#09089500), which has a drainage area of 64.6 square miles (See Gage Summary in Appendix C) and by the USGS StreamStats Water Resources Web Application Program (see http://water.usgs.gov/osw/streamstats/index.html). The total drainage area upstream of this ISF segment of Beaver Dams Creek is 0.8 square miles. The period of record for the West Divide Creek near Raven gage was 1955 to 2005, the period of record used by staff in their analysis was 1955 to 2005, or 50 years of record. Table 2 below displays the estimated flow of Beaver Dams Creek at the lower terminus of the instream flow reach in terms of a percentage of exceedence.

[1] Additional R2CROSS and Streamflow data was subsequently collected in 2011.



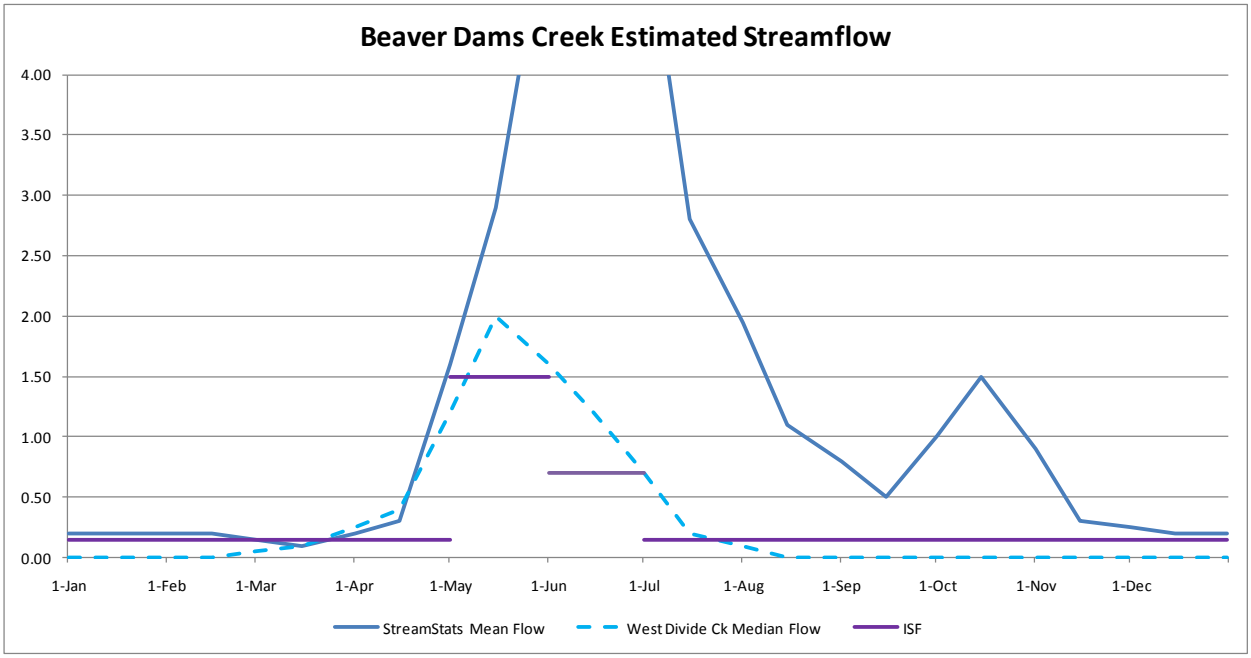


Table 2: Estimated Streamflow for Beaver Dam Creek

Beaver Dams Creek				Drainage Area = 0.8								
Exceedences	January	February	March	April	May	June	July	August	September	October	November	December
1%	0.1	0.1	0.6	3.2	8.1	6.3	1.6	0.4	0.2	0.2	0.2	0.1
5%	0.1	0.1	0.3	1.9	6.0	3.9	1.1	0.2	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.2	1.4	5.0	2.9	0.9	0.1	0.1	0.1	0.1	0.1
20%	0.1	0.0	0.1	1.0	3.6	2.2	0.5	0.1	0.0	0.1	0.1	0.1
50%	0.0	0.0	0.1	0.4	2.0	1.2	0.2	0.0	0.0	0.0	0.0	0.0
80%	0.0	0.0	0.0	0.2	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0
90%	0.0	0.0	0.0	0.1	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
95%	0.0	0.0	0.0	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
99%	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beaver Dams Creek Streamstats Mean Flow												
	January	February	March	April	May	June	July	August	September	October	November	December
	0.2	0.2	0.1	0.3	2.9	8.0	2.8	1.1	0.5	1.5	0.3	0.2
	Green indicates flow greater than summer flow recommendation and Yellow indicates flow greater than winter flow recommendation											

Table 2 shows that the summer flow recommendation of 0.9 cfs is available at least 50% of the time from May through August and 0.35 cfs is available 50% of the time during September and October. Based on the preliminary water availability analysis the winter, base flow recommendation was reduced to 0.14 cfs. After collecting additional data in 2011 and incorporating the above water availability constraints, the original instream flow recommendation was modified to the following:

- 0.9 cubic feet per second is recommended May 1 through August 31;
- 0.35 cubic feet per second is recommended from September 1 through October 31;
- 0.14 cubic feet per second is recommended from November 1 through April 30.

Existing Water Right Information

CPW staff has analyzed the Division of Water Resources' water rights tabulation and will consult with the Division Engineer's Office (DEO) to identify any potential water availability problems due to existing diversions. Preliminarily, records indicate that there are no surface water diversions located within this reach of Beaver Dam Creek.

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Beaver Dams Creek						CROSS-SECTION NO.:
CROSS-SECTION LOCATION: 39° 21' 51.6" 107° 28' 22.0"						
25' u/s of East Divide Creek						
DATE: 7/8/10	OBSERVERS: UPPENDAHL					
LEGAL DESCRIPTION	¼ SECTION:	SECTION: 17	TOWNSHIP: 8 N(S)	RANGE: 90 E(W)	PM: 6	
COUNTY: MESA	WATERSHED: DIVIDE CREEK	WATER DIVISION: 5	DOW WATER CODE: 20979			
MAP(S):	USGS:					
	USFS:					

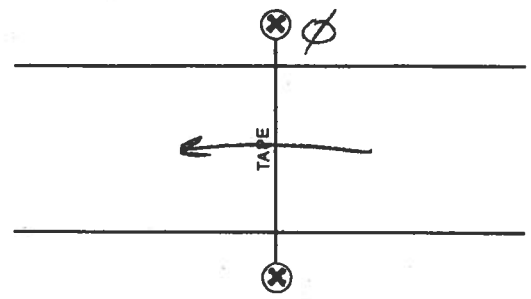
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES) / NO	METER TYPE: MARSH-McBIRNEY			
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: _____ lbs/foot	TAPE TENSION: _____ lbs
CHANNEL BED MATERIAL SIZE RANGE:	PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS:		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	
⊗ Tape @ Stake RB	0.0	
① WS @ Tape LB/RB	0.0	
② WS Upstream	3.0	10.31
③ WS Downstream	3.3	10.48
SLOPE	0.17 / 6.3 = 0.027	

SKETCH



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:

COMMENTS

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:	CROSS-SECTION NO.:	DATE:	SHEET OF
BEAVER DAMS CREEK	070810-2	7/8/10	1 OF ___

BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME: 12:00

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
TOP PIN	Ø		7.51								
BASE PIN	Ø		7.74								
	1		7.93								
	2		8.41								
	3		8.86								
	4		9.30								
	5		9.33								
	6		9.59								
GL	7		9.60								
	8		10.04								
	8.5		10.35								
	9		10.30								
SW LB	9.5		10.43	Ø				Ø			
	9.8			.05				Ø			
	10.1			.05				Ø			
	10.4			.10				.16			
	10.7			.20				1.11			
	11.0			.20				.97			
	11.3			.10				.10			
	11.6			.05				Ø			
SW RB	12.0		10.43	Ø				Ø			
	13		10.35								
GL	13.3		9.45								
	14		9.45								
	15		8.90								
	16		8.42								
	18		7.43								
BASE	19		6.92								
TOP	19		6.68								
TOTALS:											

End of Measurement	Time:	Gage Reading: ____ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: BEAVER DAMS CK						CROSS-SECTION NO.:	
CROSS-SECTION LOCATION: 39° 21' 51.6" 107° 28' 22.0"							
DATE: 7/21/11	OBSERVERS: UPPENDAHL + CHESTNUT						
LEGAL DESCRIPTION	¼ SECTION: 17	SECTION: 17	TOWNSHIP: 8 N(S)	RANGE: 90 E(W)	PM: 6		
COUNTY: MESA	WATERSHED: DIVIDE CREEK	WATER DIVISION: 5	DOW WATER CODE: 20979				
MAP(S):	USGS:						
	USFS:						

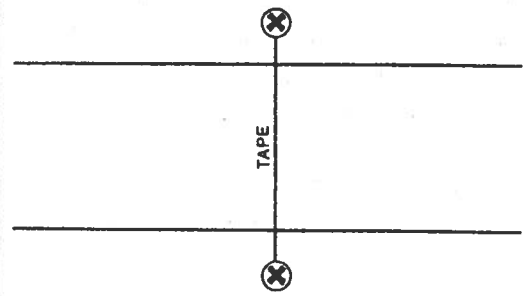
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES)/NO	METER TYPE: MARSH McBirney			
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: _____ lbs/foot	TAPE TENSION: _____ lbs
CHANNEL BED MATERIAL SIZE RANGE:		PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS:	

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	
⊗ Tape @ Stake RB	0.0	
① WS @ Tape LB/RB	0.0	
② WS Upstream		
③ WS Downstream		
SLOPE	0.027	

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

COMMENTS

FORM #ISF-FD-1.95

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Beaver Dams Creek	CROSS-SECTION NO.:	DATE: 7/21/11	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: _____ ft	TIME: 9:00

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Rod (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
Top	0		9.32								
Base	0		9.51								
	1		9.72								
	2		10.11								
	3		10.48								
	4		11.11								
	5		11.45								
	6		11.59								
GL	7		11.35								
SWL	8 →	8.2	11.76	0				0			
	8.5		12.27	.10				.25			
	9		12.41	.30				.28			
	9.5		12.38	.20				.60			
	9.8		12.37	.20				.54			
	10.1		12.55	.40				.62			
	10.4		12.55	.40				.75			
	10.7		12.47	.35				.35			
	11.0		12.39	.30				.03			
	11.3		12.39	.20				.29			
	11.6		12.37	.15				.49			
	12.0		12.33	.10				0			
	12.6		12.30	.16				0			
SWL [redacted]	[redacted]	13.0	12.17	0				0			
GL	[redacted]	13.3	11.61								
	13.5		11.48								
	B.P	19.0	8.73								
	T.P	19.0	8.42								
								1	22.5	11.3	
								2	22.5	22.5	
								3	22.5	16	
	SWL	8.2	12.17					4	22.5	16	
								5	22.5	60	
								6	45	16	
								7	45	32	
	* @ 6 new channel (OVER BANK High Flow)							8	22.5	90	
								9	32	120	
								10	45	90	
TOTALS:											

End of Measurement	Time:	Gage Reading: _____ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

COLORADO STREAM SURVEY E (1976 REVISION)

Surveyed by: Bennett, Martinez

(X) if stream has no fishery value [X]

	Record Data
Code No.	20979
Date	8-12-80
Section No.	1
Stream Name: Beaver	Dam Creek
Primary Drainage: Divide Creek	
Major Drainage	Colorado 32C
Lower terminus	
Location:	confluence with E. Divide Creek
T.	8 S
R.	90 W
S.	17
Width	3
Elevation	8400
Flow (c.f.s.)	wet
pH	
phth	
MO	
EDTA	
Conductivity	
X if stream profile obtained	
Upper terminus	
Location: Headwaters	
T.	8 S
R.	90 W
S.	16
Width	2
Elevation	9120
Flow	
pH	
phth	
MO	
EDTA	
Conductivity	
X if stream profile obtained	
Section Summary	
Meander factor	1.1
Length in Miles	2.0
Width in feet	2.5
Acreage	0.6
Observed Flow	
X if inundated by reservoir	
Mileage unsectioned	
Counties where section located	
County	Mesa
Miles	2.0
County	
Miles	
County	
Miles	

	Record Data
Region	NW
Beaver Dams	
Number (count or estimate)	3
Estimated acreage	0.1
Physical stream damage (% of section affected)	
Bank degredation	
Channelization	
Dredging	
Mine tailing encroachment	
Road encroachment	
Accessibility (miles)	
Surfaced	
Non-Surfaced car	
4-Wheel	
Established trail	
No established trail	2.0
Boat only	
No access	
Land Status and mileage	
USFS	2.0
BLM	
Municipal	
Div. of Wild.	
Private, no public access	
Private, open to public	
State Land Board	
County	
Mixed small tracts, open	
Mixed small tracts, closed	
Stocking	
Miles creel size	
Miles fingerling	
Miles Fry	
Miles not stocked	
Aquatic Vegetation	
Filamentous algae (x one)	
Absent	
Rare	x
Common	
Abundant	
Watercress	
X if present	
Size Classification (X one)	
Large river ≥ 100'	
River 60-99'	
Large stream 36-59'	
Medium 20-35'	
Small 10-19'	
Minor 4-9'	
Very small stream < 4'	x
Gradient (computer entry)	
Percent per mile	6.8

Beaver Dam Creek is rocky and would provide poor watering area as the water flows under the rocks.

☒ '72-'73 FISHERIES INVENTORY / 1041 RELATED DATA

Stream Code 20929

'72-'73 Inventory S - _____

Stream Name Beaver Dam Creek

Percent Open to Public _____,
('72 Inventory)

1041 Form

- Quality of Water _____,
- Pool-riffle Ratio _____,
- Temperature of Water _____,
- Clarity of Water _____,
- Fish Food Supply _____,
- Condition of Fish _____,
- Legal Access _____,
- Physical Access* _____,
- Aesthetic Value _____,
- Meanders Value _____,
- Improvement Potential _____,

'72 Inventory

- Stocking Status _____, (regularly, occasionally, rarely or never)
- Population Status _____, (normal, over-populated, under-populated)

☐ MINIMUM STREAM FLOW DATA

SB-97 Computer run Step A

- Maximum Channel Width _____,
- Maximum Wetted Perimeter _____,
- Maximum Depth _____,

"Filed on" Blue book

- Decreed Flow _____,
- Initial Month _____,
- Initial Day _____,
- Initial Year _____*

STOCKING AND FISH SAMPLING DATA

STREAM CODE 20979

STOCKING

STOCK 79-83 0 YRS

STOCKYRS N N N N N

SPECIES-SIZE STOCKED:

____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

FISH SAMPLING

SAMPLE DATE: 08 / 12 / 80

METHODS: VISU ____ ____ ____ ____

	SPECIES	#TAKEN	AVG. LENGTH (cm)	RANGE (cm)	AVG. WT (g)	RANGE (g)	%TOTAL CATCH
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

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

LOCATION INFORMATION

STREAM NAME:	BEAVER DAMS CREEK
XS LOCATION:	39 21' 51.6" 107 28' 22.0"
XS NUMBER:	072111-2
DATE:	21-Jul-11
OBSERVERS:	UPPENDAHL & CHESTNUT
1/4 SEC:	0
SECTION:	17
TWP:	8 S
RANGE:	90 W
PM:	6
COUNTY:	MESA
WATERSHED:	DIVIDE CREEK
DIVISION:	5
DOW CODE:	20979
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:	0.02698413

INPUT DATA CHECKED BY: .....DATE.....

ASSIGNED TO: ….....……..…….....DATE.....

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 072111-2

DATA POINTS= 28

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
TOP PIN	0.00	9.32			0.00		0.00	0.00	0.0%
B PIN	0.01	9.51			0.00		0.00	0.00	0.0%
	1.00	9.72			0.00		0.00	0.00	0.0%
	2.00	10.11			0.00		0.00	0.00	0.0%
	3.00	10.48			0.00		0.00	0.00	0.0%
	4.00	11.11			0.00		0.00	0.00	0.0%
	5.00	11.45			0.00		0.00	0.00	0.0%
	6.00	11.59			0.00		0.00	0.00	0.0%
1 GL	7.00	11.35			0.00		0.00	0.00	0.0%
	8.00	11.76			0.00		0.00	0.00	0.0%
SWL	8.20	12.17	0.00	0.00	0.00		0.00	0.00	0.0%
	8.50	12.27	0.10	0.25	0.32	0.10	0.04	0.01	2.6%
	9.00	12.41	0.30	0.28	0.52	0.30	0.15	0.04	11.1%
	9.50	12.38	0.20	0.60	0.50	0.20	0.08	0.05	12.7%
	9.80	12.37	0.20	0.54	0.30	0.20	0.06	0.03	8.6%
	10.10	12.55	0.40	0.62	0.35	0.40	0.12	0.07	19.7%
	10.40	12.55	0.40	0.75	0.30	0.40	0.12	0.09	23.8%
	10.70	12.47	0.35	0.35	0.31	0.35	0.11	0.04	9.7%
	11.00	12.39	0.20	0.03	0.31	0.20	0.06	0.00	0.5%
	11.30	12.39	0.20	0.29	0.30	0.20	0.06	0.02	4.6%
	11.60	12.37	0.15	0.49	0.30	0.15	0.05	0.03	6.8%
	12.00	12.33	0.10	0.00	0.40	0.10	0.05	0.00	0.0%
	12.60	12.30	0.10	0.00	0.60	0.10	0.05	0.00	0.0%
SWL	13.00	12.17	0.00	0.00	0.42		0.00	0.00	0.0%
1 GL	13.30	11.61			0.00		0.00	0.00	0.0%
	13.50	11.48			0.00		0.00	0.00	0.0%
B PIN	19.00	8.73			0.00		0.00	0.00	0.0%
TOP PIN	19.01	8.42			0.00		0.00	0.00	0.0%
TOTALS ----------					4.93	0.4 (Max.)	0.95	0.38	100.0%

Manning's n = 0.2035
Hydraulic Radius= 0.19213793

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 072111-2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	0.95	0.97	2.3%
11.92	0.95	2.20	132.3%
11.94	0.95	2.10	121.6%
11.96	0.95	2.00	111.0%
11.98	0.95	1.90	100.5%
12.00	0.95	1.80	90.0%
12.02	0.95	1.70	79.5%
12.04	0.95	1.60	69.0%
12.06	0.95	1.50	58.6%
12.08	0.95	1.41	48.3%
12.10	0.95	1.31	38.0%
12.12	0.95	1.21	27.7%
12.13	0.95	1.16	22.6%
12.14	0.95	1.11	17.5%
12.15	0.95	1.07	12.4%
12.16	0.95	1.02	7.3%
12.17	0.95	0.97	2.3%
12.18	0.95	0.92	-2.8%
12.19	0.95	0.87	-7.7%
12.20	0.95	0.83	-12.6%
12.21	0.95	0.78	-17.5%
12.22	0.95	0.74	-22.3%
12.24	0.95	0.65	-31.6%
12.26	0.95	0.56	-40.7%
12.28	0.95	0.48	-49.6%
12.30	0.95	0.40	-58.1%
12.32	0.95	0.32	-66.1%
12.34	0.95	0.26	-73.1%
12.36	0.95	0.19	-79.4%
12.38	0.95	0.14	-85.0%
12.40	0.95	0.11	-88.7%
12.42	0.95	0.08	-91.1%

WATERLINE AT ZERO
AREA ERROR = 12.175

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 072111-2 Constant Manning's n

STAGING TABLE *GL* = lowest Grassline elevation corrected for sag
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	11.61	5.67	0.68	0.94	3.84	6.42	100.0%	0.60	3.27	0.85
	11.62	5.62	0.67	0.93	3.76	6.36	99.1%	0.59	3.17	0.84
	11.67	5.47	0.64	0.88	3.48	6.18	96.2%	0.56	2.85	0.82
	11.72	5.33	0.60	0.83	3.21	5.99	93.3%	0.54	2.54	0.79
	11.77	5.20	0.57	0.78	2.95	5.82	90.7%	0.51	2.25	0.76
	11.82	5.15	0.52	0.73	2.69	5.71	88.9%	0.47	1.95	0.73
	11.87	5.10	0.48	0.68	2.43	5.60	87.2%	0.43	1.67	0.69
	11.92	5.05	0.43	0.63	2.18	5.48	85.4%	0.40	1.41	0.65
	11.97	5.00	0.39	0.58	1.93	5.37	83.7%	0.36	1.17	0.61
	12.02	4.95	0.34	0.53	1.68	5.26	81.9%	0.32	0.94	0.56
	12.07	4.90	0.29	0.48	1.43	5.15	80.2%	0.28	0.73	0.51
	12.12	4.85	0.25	0.43	1.19	5.03	78.4%	0.24	0.54	0.46
WL	12.17	4.77	0.20	0.38	0.95	4.90	76.4%	0.19	0.38	0.40
	12.22	4.47	0.16	0.33	0.72	4.58	71.4%	0.16	0.25	0.35
	12.27	4.16	0.12	0.28	0.50	4.26	66.4%	0.12	0.14	0.29
	12.32	3.42	0.09	0.23	0.31	3.50	54.6%	0.09	0.07	0.24
	12.37	2.52	0.06	0.18	0.16	2.59	40.4%	0.06	0.03	0.18
	12.42	0.98	0.08	0.13	0.08	1.03	16.1%	0.08	0.02	0.22
	12.47	0.71	0.05	0.08	0.04	0.74	11.5%	0.05	0.01	0.17
	12.52	0.44	0.02	0.03	0.01	0.45	7.0%	0.02	0.00	0.09

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 072111-2

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.38	cfs
CALCULATED FLOW (Qc)=	0.38	cfs
(Qm-Qc)/Qm * 100 =	-0.4	%
MEASURED WATERLINE (WLm)=	12.17	ft
CALCULATED WATERLINE (WLc)=	12.17	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.40	ft
MAX CALCULATED DEPTH (Dc)=	0.38	ft
(Dm-Dc)/Dm * 100	6.1	%
MEAN VELOCITY=	0.40	ft/sec
MANNING'S N=	0.203	
SLOPE=	0.02698413	ft/ft
.4 * Qm =	0.2	cfs
2.5 * Qm=	0.9	cfs

RECOMMENDED INSTREAM FLOW:
============================

FLOW (CFS)	PERIOD
___________________	___________________
___________________	___________________
___________________	___________________
___________________	___________________

RATIONALE FOR RECOMMENDATION:
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____
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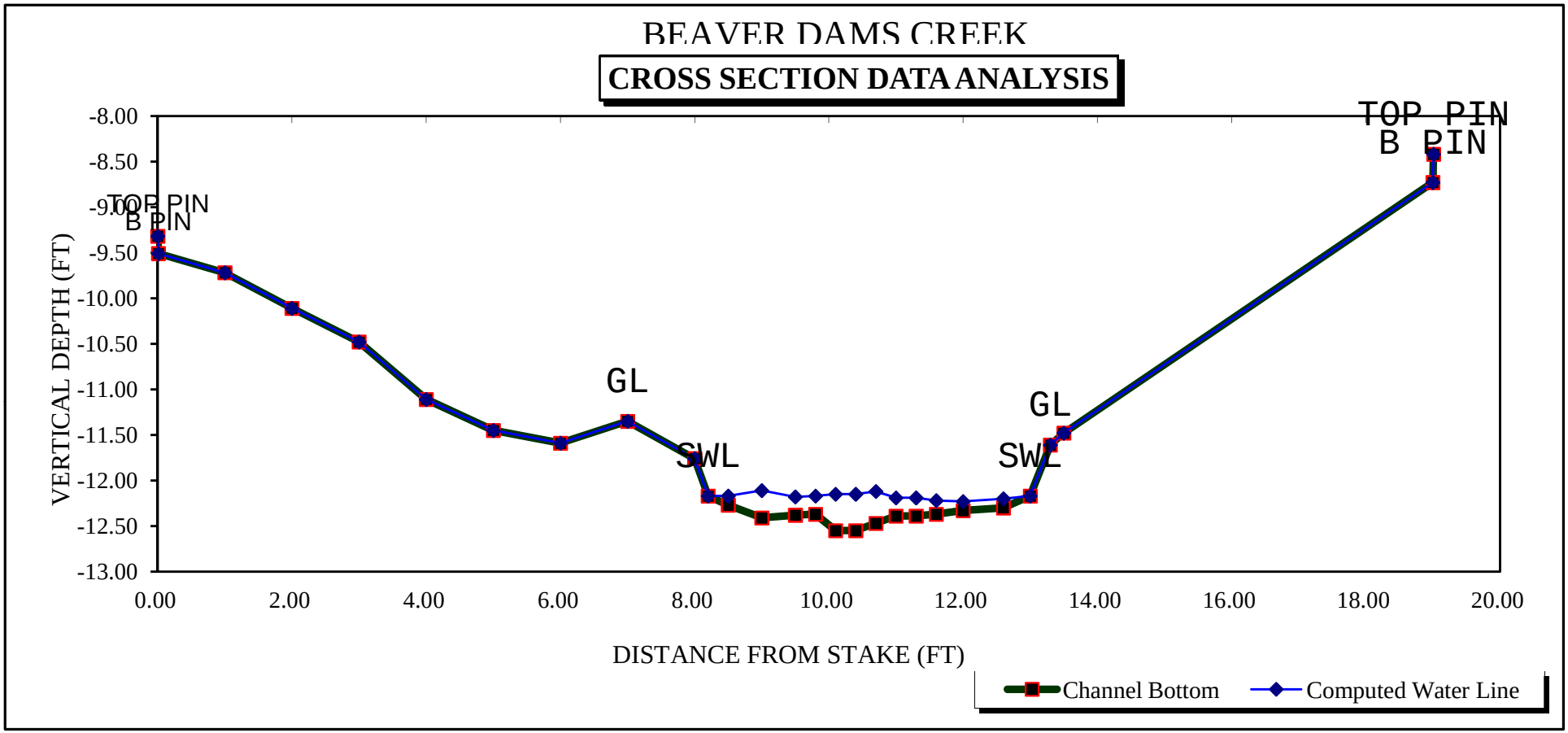
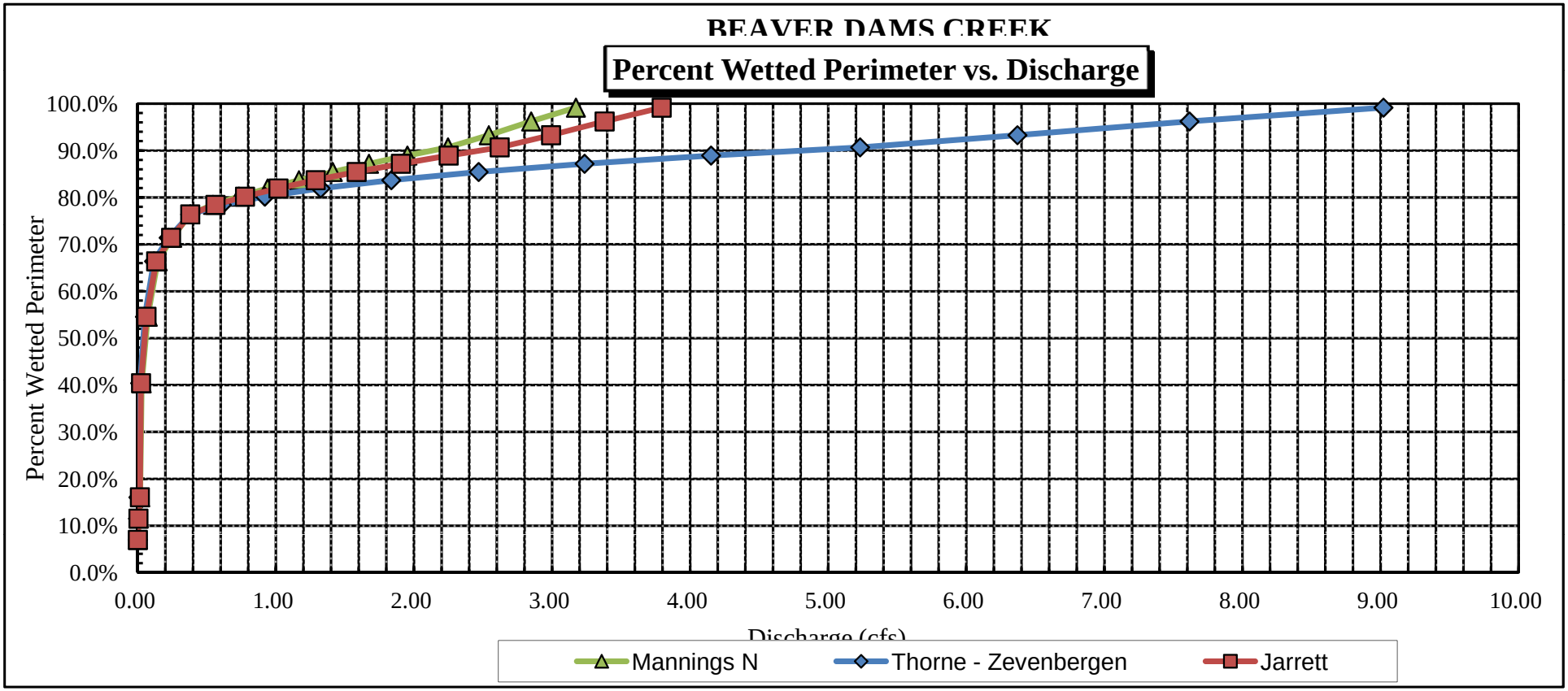
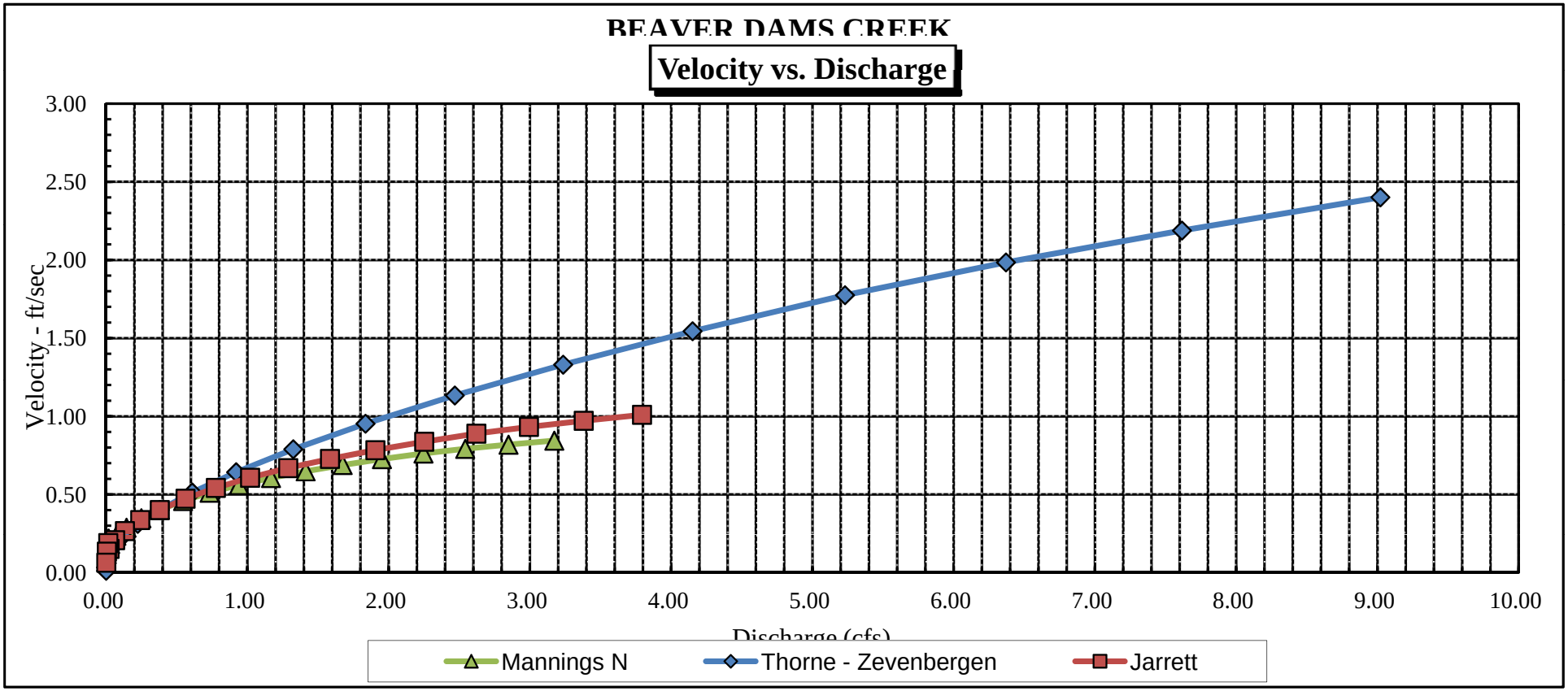
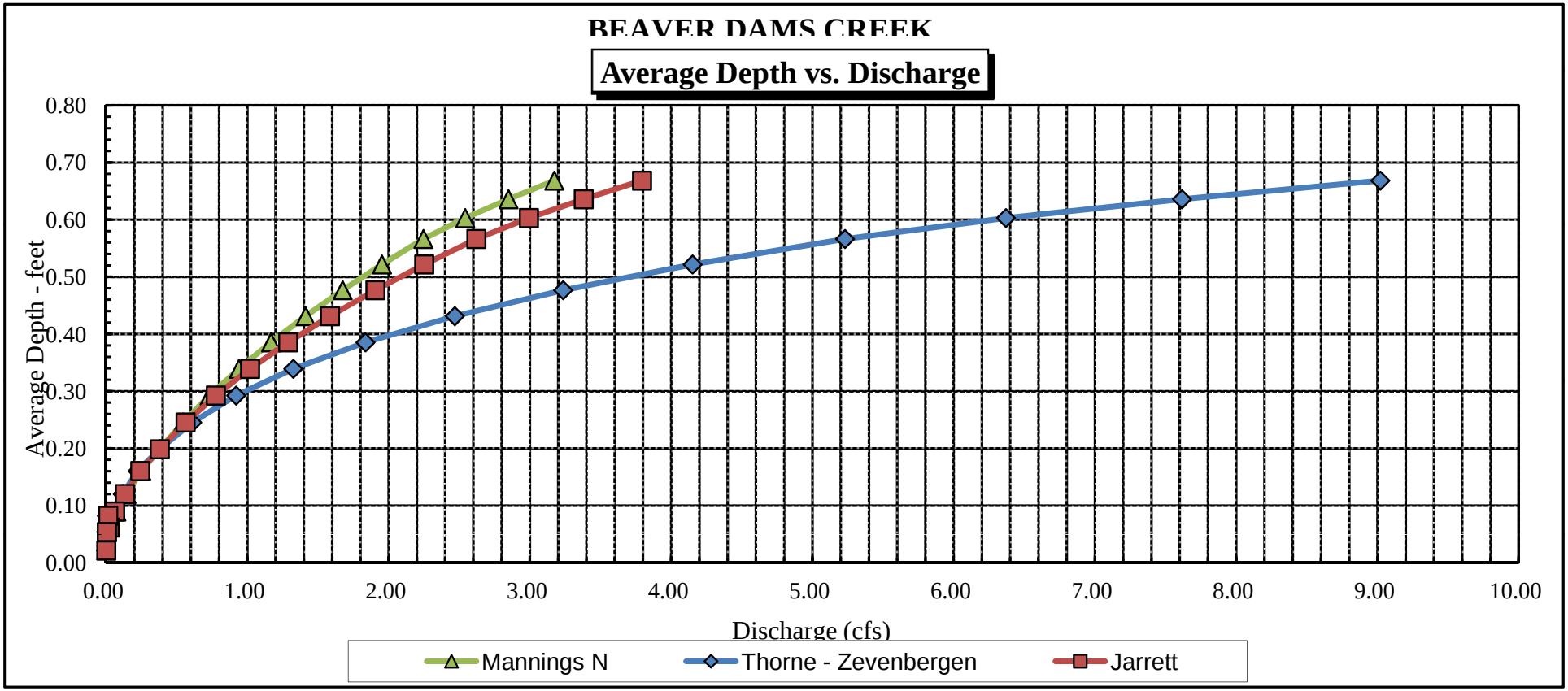
RECOMMENDATION BY: ………………...………..……............................. AGENCY...……………………......…....…...…….…...... DATE:.......…...…......……………

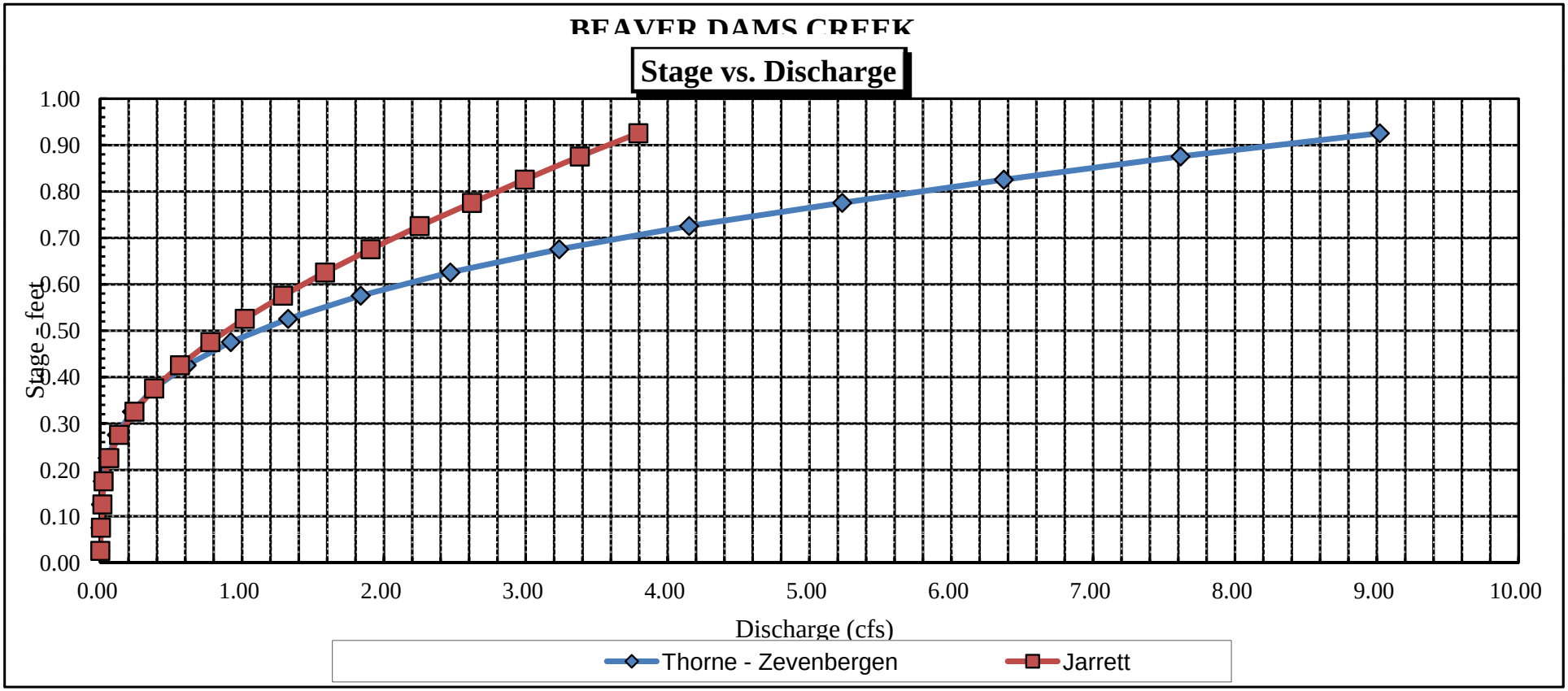
CWCB REVIEW BY: ..……………………….....……………………………………………………...…............. DATE:.................…………….....…


BEAVER DAMS CREEK
CROSS SECTION DATA ANALYSIS
TOP PIN
B PIN
TOP PIN
B PIN
GL
SWL
GL
SWL
-8.00
-8.50
-9.00
-9.50
-10.00
-10.50
-11.00
-11.50
-12.00
-12.50
-13.00
VERTICAL DEPTH (FT)
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


BEAVER DAMS CREEK
Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


BEAVER DAMS CREEK
Velocity vs. Discharge
Velocity - ft/sec
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


BEAVER DAMS CREEK
Average Depth vs. Discharge
Average Depth - feet
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


BEAVER DAMS CREEK
Stage vs. Discharge
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Stage - feet
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 070810-2

DATA POINTS= 29

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
TOP PIN	0.00	7.51			0.00		0.00	0.00	0.0%
B PIN	0.01	7.74			0.00		0.00	0.00	0.0%
	1.00	7.93			0.00		0.00	0.00	0.0%
	2.00	8.41			0.00		0.00	0.00	0.0%
	3.00	8.86			0.00		0.00	0.00	0.0%
	4.00	9.30			0.00		0.00	0.00	0.0%
	5.00	9.33			0.00		0.00	0.00	0.0%
	6.00	9.59			0.00		0.00	0.00	0.0%
1 GL	7.00	9.60			0.00		0.00	0.00	0.0%
	8.00	10.04			0.00		0.00	0.00	0.0%
	8.50	10.35			0.00		0.00	0.00	0.0%
	9.00	10.30			0.00		0.00	0.00	0.0%
SWL	9.50	10.43	0.00	0.00	0.00		0.00	0.00	0.0%
	9.80	10.48	0.05	0.00	0.30	0.05	0.02	0.00	0.0%
	10.10	10.48	0.05	0.00	0.30	0.05	0.02	0.00	0.0%
	10.40	10.53	0.10	0.16	0.30	0.10	0.03	0.00	3.6%
	10.70	10.63	0.20	1.11	0.32	0.20	0.06	0.07	50.2%
	11.00	10.63	0.20	0.97	0.30	0.20	0.06	0.06	43.9%
	11.30	10.53	0.10	0.10	0.32	0.10	0.03	0.00	2.3%
	11.60	10.48	0.05	0.00	0.30	0.05	0.02	0.00	0.0%
SWL	12.00	10.43	0.00	0.00	0.40		0.00	0.00	0.0%
	13.00	10.35			0.00		0.00	0.00	0.0%
1 GL	13.30	9.45			0.00		0.00	0.00	0.0%
	14.00	9.45			0.00		0.00	0.00	0.0%
	15.00	8.90			0.00		0.00	0.00	0.0%
	16.00	8.42			0.00		0.00	0.00	0.0%
	18.00	7.43			0.00		0.00	0.00	0.0%
B PIN	19.00	6.92			0.00		0.00	0.00	0.0%
TOP PIN	19.01	6.68			0.00		0.00	0.00	0.0%
TOTALS ----------					2.55	0.2 (Max.)	0.23	0.13	100.0%

Manning's n = 0.0837
Hydraulic Radius= 0.08928632

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 070810-2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	0.23	0.23	0.0%
10.18	0.23	1.26	451.9%
10.20	0.23	1.16	409.6%
10.22	0.23	1.06	367.7%
10.24	0.23	0.97	326.1%
10.26	0.23	0.88	284.8%
10.28	0.23	0.78	243.9%
10.30	0.23	0.69	203.3%
10.32	0.23	0.60	164.2%
10.34	0.23	0.52	128.0%
10.36	0.23	0.44	94.5%
10.38	0.23	0.37	63.9%
10.39	0.23	0.34	49.7%
10.40	0.23	0.31	36.2%
10.41	0.23	0.28	23.4%
10.42	0.23	0.25	11.3%
10.43	0.23	0.23	0.0%
10.44	0.23	0.20	-10.7%
10.45	0.23	0.18	-20.7%
10.46	0.23	0.16	-30.2%
10.47	0.23	0.14	-39.0%
10.48	0.23	0.12	-47.3%
10.50	0.23	0.09	-59.4%
10.52	0.23	0.07	-69.4%
10.54	0.23	0.05	-77.5%
10.56	0.23	0.04	-84.3%
10.58	0.23	0.02	-90.1%
10.60	0.23	0.01	-94.9%
10.62	0.23	0.00	-98.5%
10.64	0.23	0.00	-100.0%
10.66	0.23	0.00	-100.0%
10.68	0.23	0.00	-100.0%

WATERLINE AT ZERO
AREA ERROR = 10.430

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 070810-2 Constant Manning's n

STAGING TABLE *GL* = lowest Grassline elevation corrected for sag
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	9.60	6.25	0.71	1.03	4.45	7.04	100.0%	0.63	9.56	2.15
	9.63	6.17	0.69	1.00	4.26	6.94	98.5%	0.61	8.99	2.11
	9.68	6.04	0.65	0.95	3.96	6.76	96.0%	0.59	8.08	2.04
	9.73	5.91	0.62	0.90	3.66	6.58	93.5%	0.56	7.22	1.97
	9.78	5.78	0.58	0.85	3.37	6.41	91.0%	0.53	6.40	1.90
	9.83	5.65	0.55	0.80	3.08	6.23	88.4%	0.49	5.62	1.82
	9.88	5.52	0.51	0.75	2.80	6.05	85.9%	0.46	4.89	1.75
	9.93	5.39	0.47	0.70	2.53	5.87	83.4%	0.43	4.20	1.66
	9.98	5.26	0.43	0.65	2.26	5.70	80.9%	0.40	3.56	1.58
	10.03	5.13	0.39	0.60	2.00	5.52	78.4%	0.36	2.97	1.48
	10.08	5.03	0.35	0.55	1.75	5.37	76.2%	0.33	2.42	1.38
	10.13	4.93	0.30	0.50	1.50	5.22	74.1%	0.29	1.91	1.27
	10.18	4.83	0.26	0.45	1.26	5.07	72.0%	0.25	1.44	1.15
	10.23	4.73	0.21	0.40	1.02	4.92	69.9%	0.21	1.04	1.02
	10.28	4.64	0.17	0.35	0.78	4.78	67.8%	0.16	0.68	0.87
	10.33	4.12	0.14	0.30	0.56	4.21	59.8%	0.13	0.42	0.76
	10.38	3.32	0.11	0.25	0.37	3.37	47.9%	0.11	0.25	0.67
WL	10.43	2.50	0.09	0.20	0.23	2.55	36.2%	0.09	0.13	0.58
	10.48	1.50	0.08	0.15	0.12	1.54	21.9%	0.08	0.06	0.53
	10.53	0.90	0.07	0.10	0.06	0.93	13.2%	0.06	0.03	0.47
	10.58	0.60	0.04	0.05	0.02	0.62	8.8%	0.04	0.01	0.32
	10.63	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: BEAVER DAMS CREEK
XS LOCATION: 39 21' 51.6" 107 28' 22.0"
XS NUMBER: 070810-2

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.13	cfs
CALCULATED FLOW (Qc)=	0.13	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	10.43	ft
CALCULATED WATERLINE (WLc)=	10.43	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.20	ft
MAX CALCULATED DEPTH (Dc)=	0.20	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	0.58	ft/sec
MANNING'S N=	0.084	
SLOPE=	0.02698413	ft/ft
.4 * Qm =	0.1	cfs
2.5 * Qm=	0.3	cfs

RECOMMENDED INSTREAM FLOW:
==========

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

RATIONALE FOR RECOMMENDATION:
==========

_____
_____
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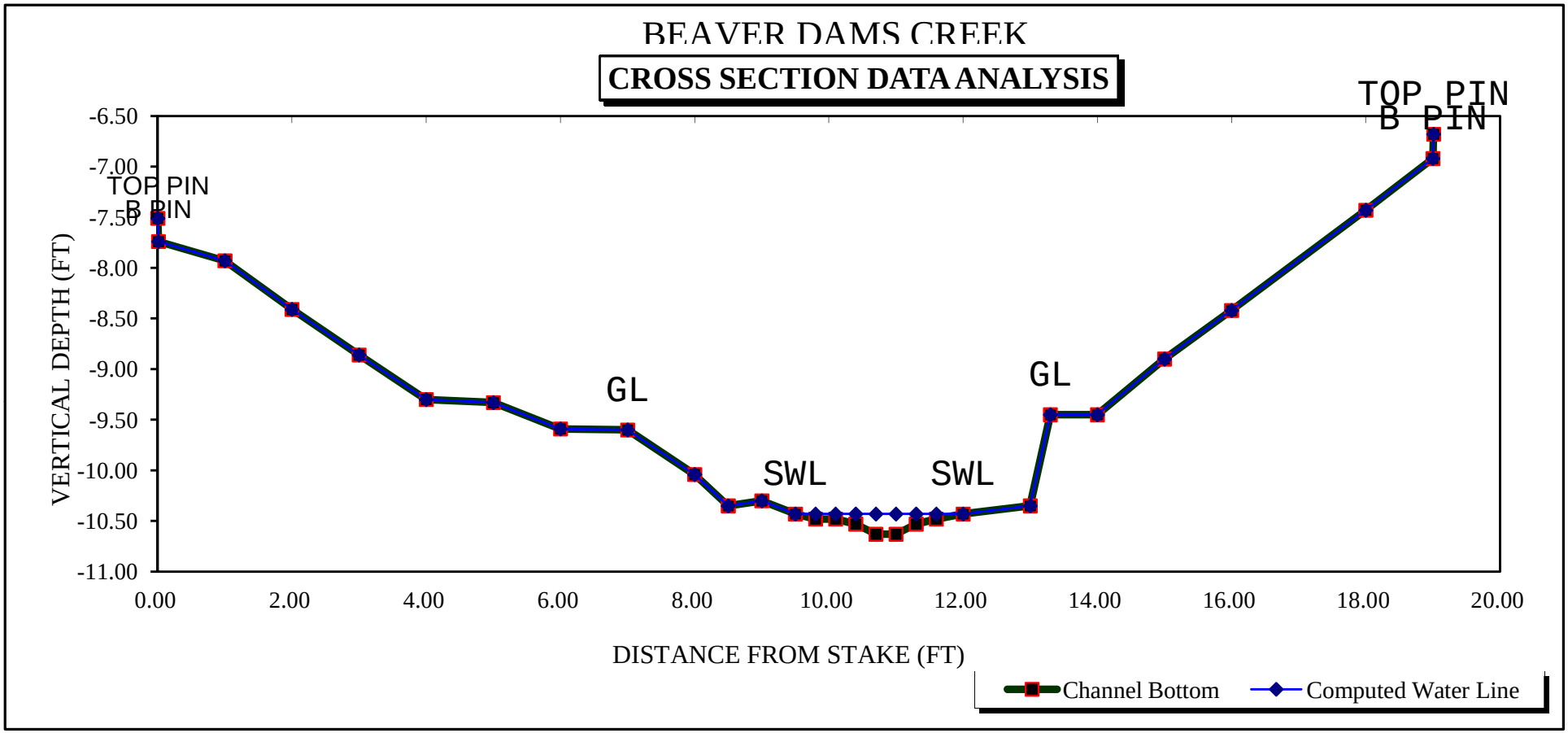
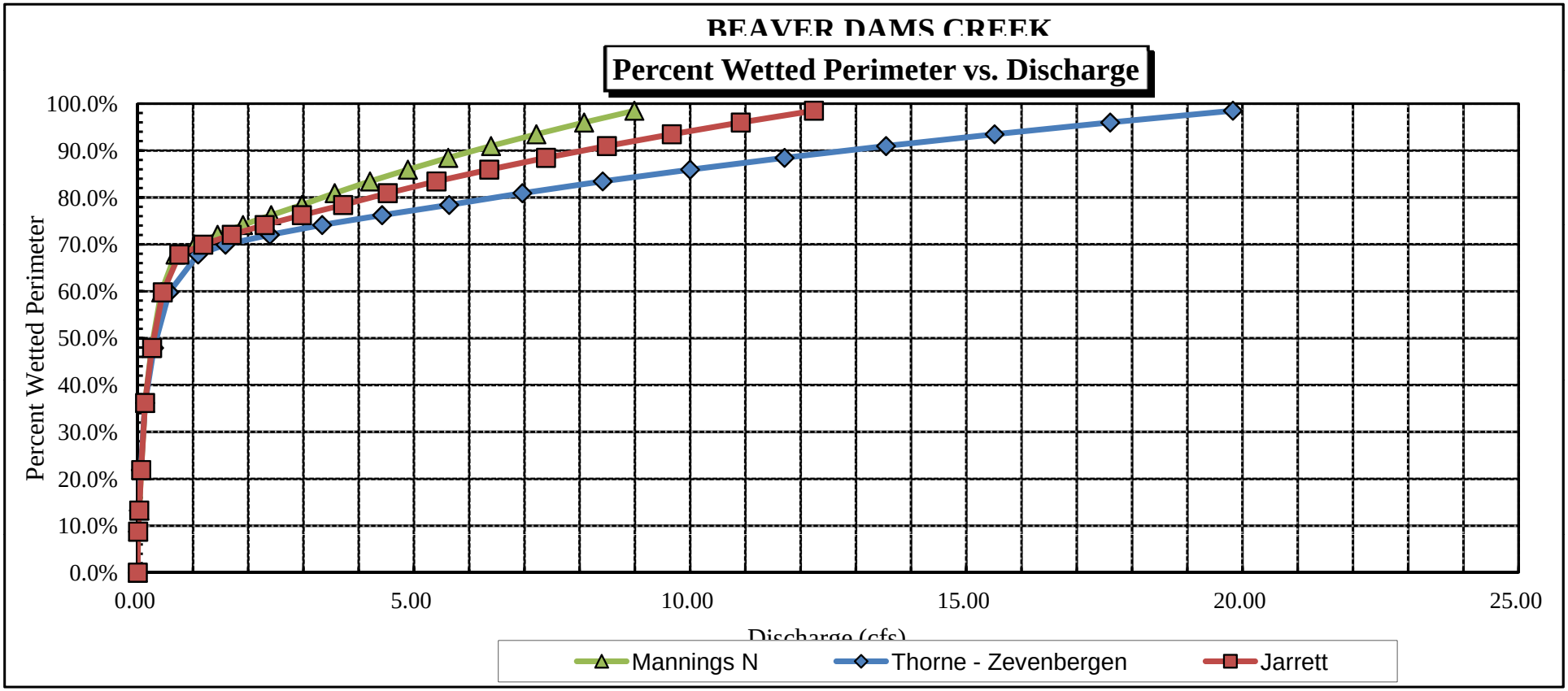
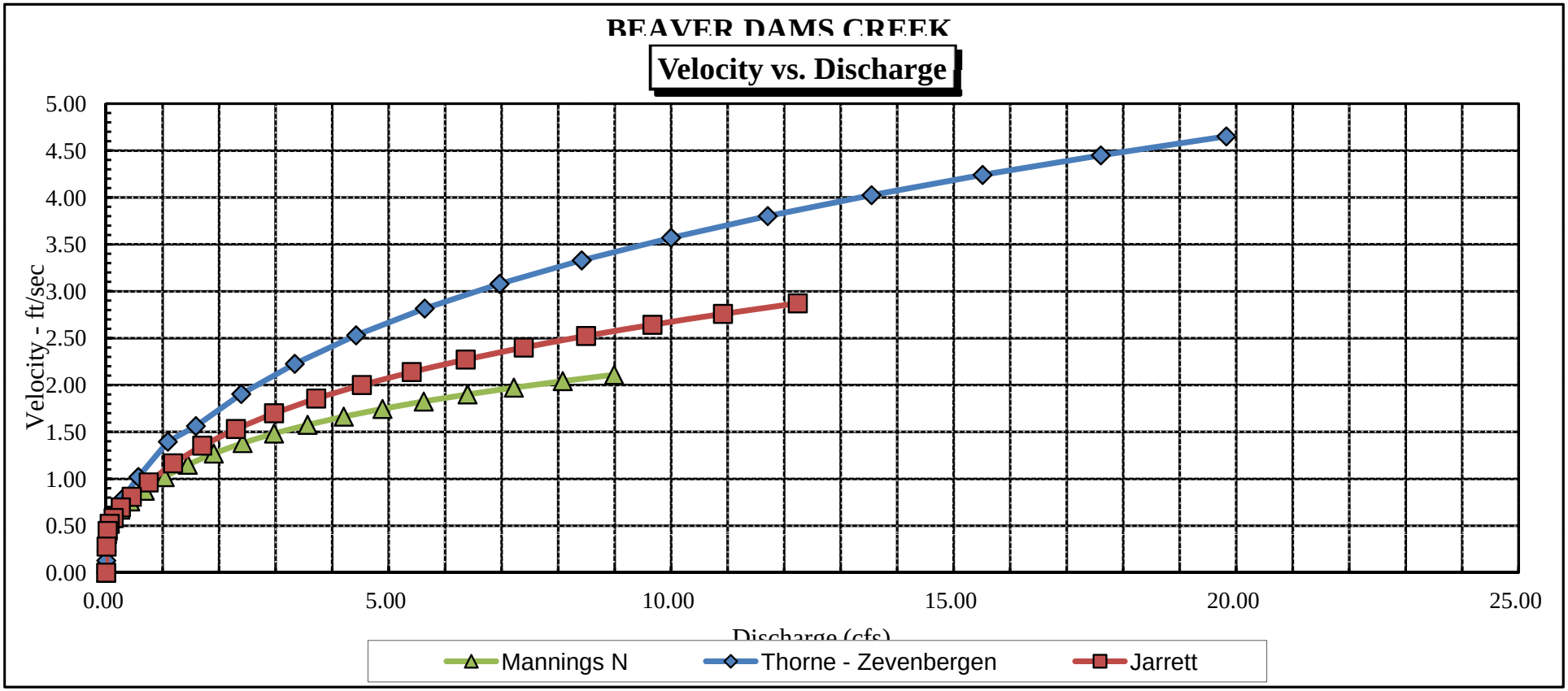
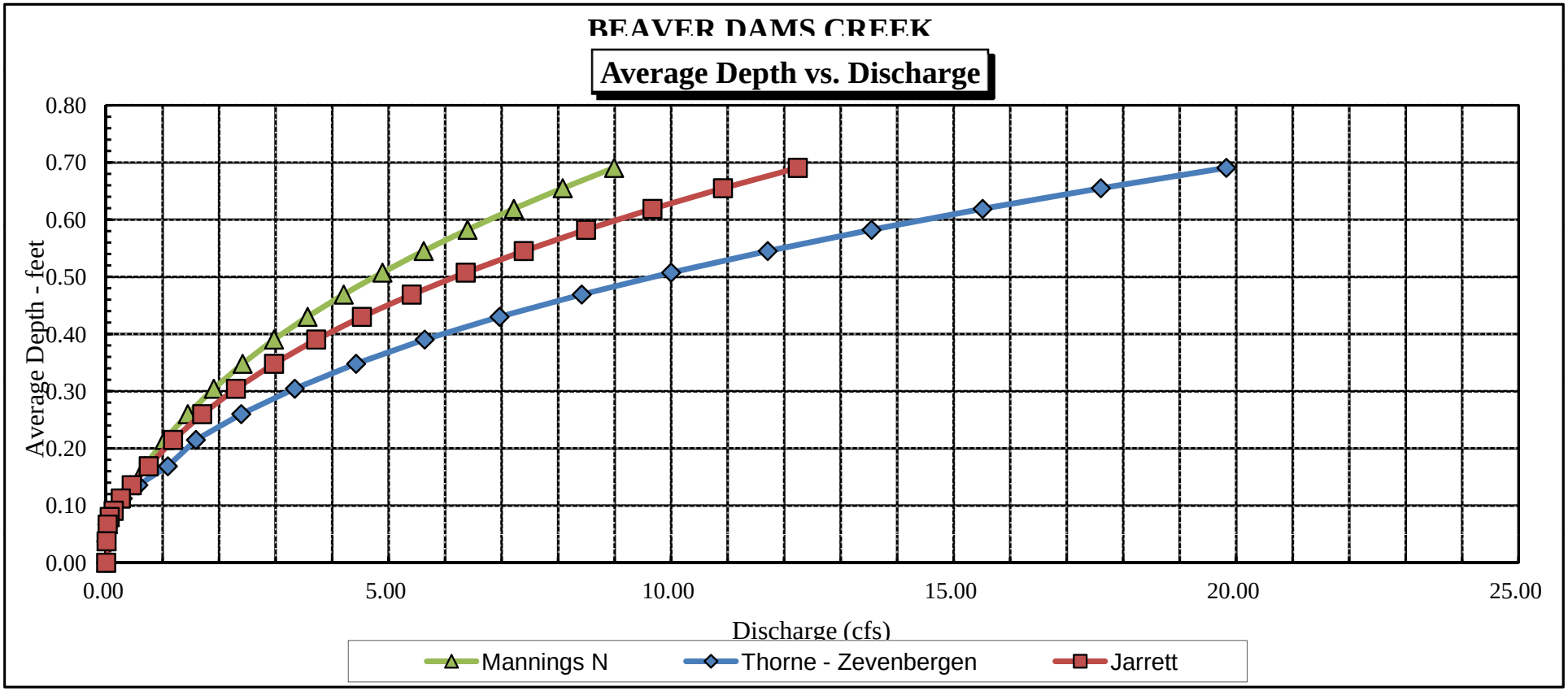
RECOMMENDATION BY: ..... AGENCY..... DATE:.....

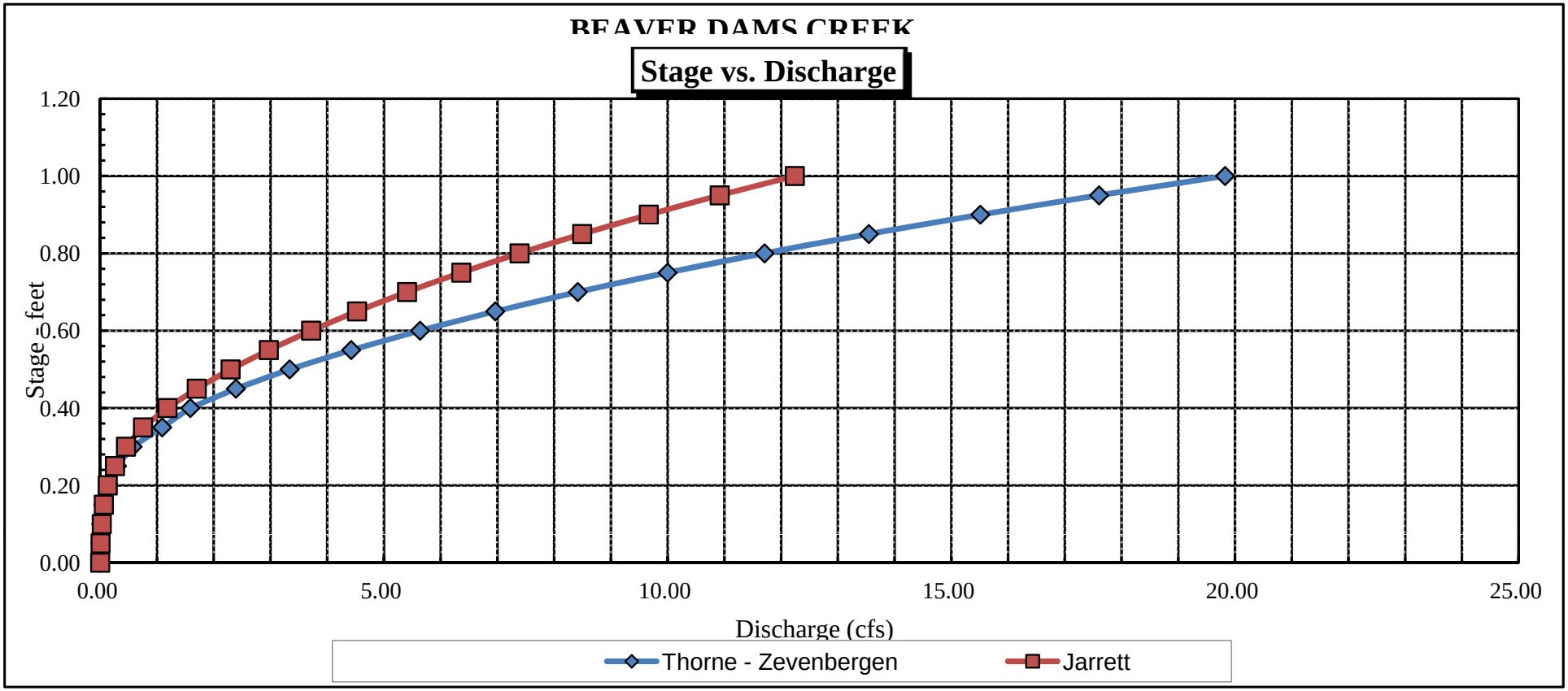
CWCB REVIEW BY: ..... DATE:.....


BEAVER DAMS CREEK
CROSS SECTION DATA ANALYSIS
TOP PIN
B PIN
TOP PIN
B PIN
GL
GL
SWL
SWL
-6.50
-7.00
-7.50
-8.00
-8.50
-9.00
-9.50
-10.00
-10.50
-11.00
VERTICAL DEPTH (FT)
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line


BEAVER DAMS CREEK
Percent Wetted Perimeter vs. Discharge
Percent Wetted Perimeter
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.00
5.00
10.00
15.00
20.00
25.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett

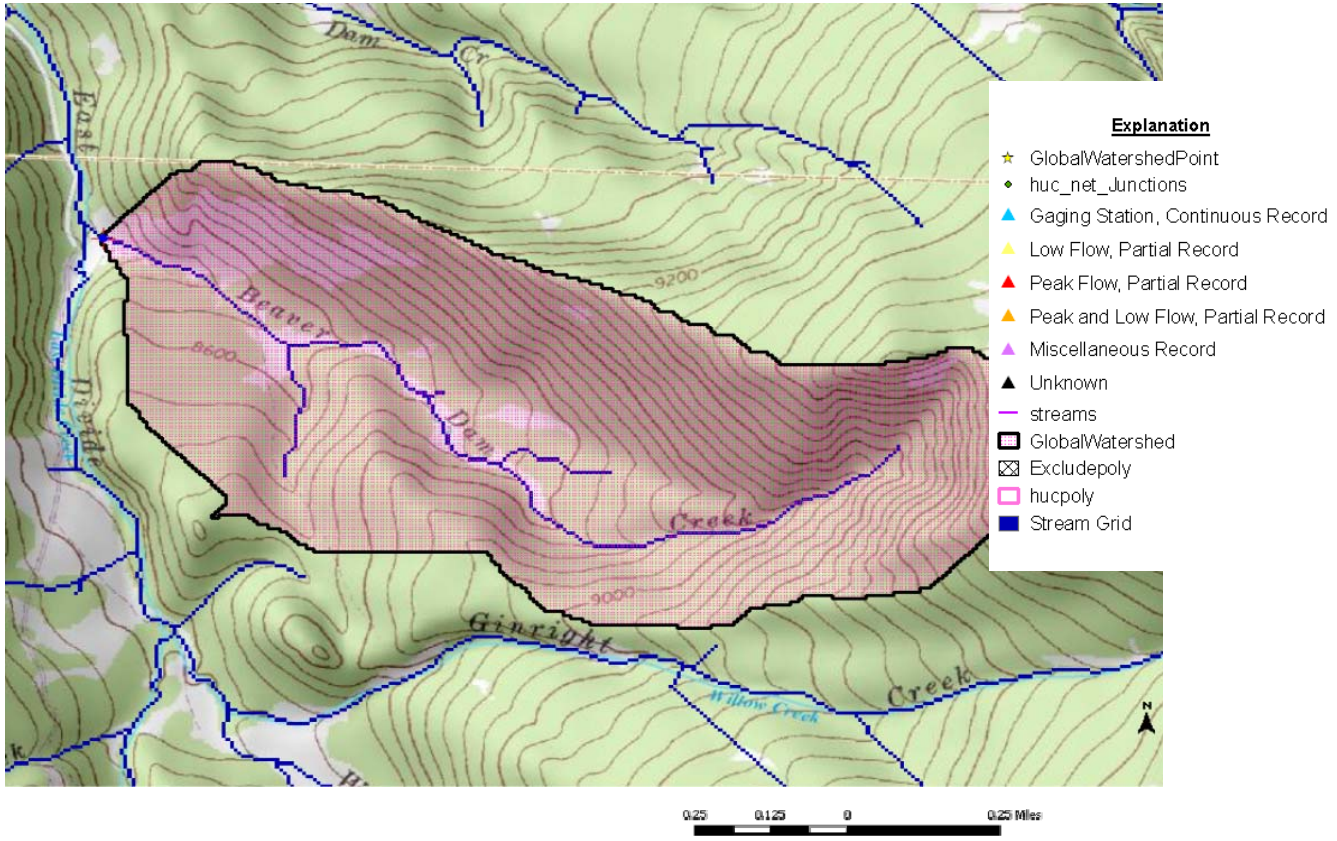

BEAVER DAMS CREEK
Velocity vs. Discharge
Velocity - ft/sec
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
5.00
10.00
15.00
20.00
25.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


BEAVER DAMS CREEK
Average Depth vs. Discharge
Average Depth - feet
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
5.00
10.00
15.00
20.00
25.00
Discharge (cfs)
Mannings N
Thorne - Zevenbergen
Jarrett


BEAVER DAMS CREEK
Stage vs. Discharge
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Stage - feet
0.00
5.00
10.00
15.00
20.00
25.00
Discharge (cfs)
Thorne - Zevenbergen
Jarrett

USGS Colorado StreamStats

StreamStats Print Page



12/21/2010 4:19:07 PM

USGS Colorado StreamStats

Streamstats Ungaged Site Report

Date: Tue Dec 21 2010 16:20:45 Mountain Standard Time
Site Location: Colorado
NAD27 Latitude: 39.3642 (39 21 51)
NAD27 Longitude: -107.4717 (-107 28 18)
NAD83 Latitude: 39.3642 (39 21 51)
NAD83 Longitude: -107.4723 (-107 28 20)
Drainage Area: 0.81 mi2

Peak-Flows Basin Characteristics

100% Mountain Region Peak Flow (0.81 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.81 (below min value 1)	1	1060
Mean Basin Slope from 10m DEM (percent)	26.4	7.6	60.2
Mean Annual Precipitation (inches)	31.02	18	47

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Low-Flows Basin Characteristics

100% Mountain Region Min Flow (0.81 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.81 (below min value 1)	1	1060
Mean Annual Precipitation (inches)	31.02	18	47
Mean Basin Elevation (feet)	8950	8600	12000

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Flow-Duration Basin Characteristics

100% Mountain Region Flow Duration (0.81 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.81 (below min value 1)	1	1060
Mean Annual Precipitation (inches)	31.07	18	47

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Maximum-Flows Basin Characteristics

100% Mountain Region Max Flow (0.81 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.81 (below min value 1)	1	1060
Mean Annual Precipitation (inches)	31.07	18	47

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Mean-Flows Basin Characteristics

100% Mountain Region Mean Flow (0.81 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.81 (below min value 1)	1	1060
Mean Annual Precipitation (inches)	31.07	18	47

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak-Flows Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2	17.9				
PK5	25.5				
PK10	30.1				
PK25	37.2				
PK50	43.8				
PK100	48.3				
PK200	52				
PK500	61.1				

Low-Flows Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
M7D2Y	0.0216				
M7D10Y	0.0087				
M7D50Y	0.015				

Flow-Duration Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
D10	3.9				
D25	0.83				
D50	0.28				
D75	0.14				
D90	0.0649				

Maximum-Flows Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
V7D2Y	10.9				
V7D10Y	15.8				
V7D50Y	21.1				

Mean-Flows Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
Q1	0.16				
Q2	0.15				
Q3	0.14				
Q4	0.25				
Q5	2.9				
Q6	8				
Q7	2.83				
Q8	1.1				
Q9	0.54				
QA	1.45				
Q10	0.38				
Q11	0.27				
Q12	0.19