

DRAFT RECOMMENDATION – SUBJECT TO CHANGE

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 instream flow recommendation for Disappointment Creek, located in Water Division 7.

Location and Land Status. Disappointment Creek is tributary to the Dolores River approximately four miles southeast of Slickrock, CO. This recommendation covers a reach beginning at the confluence with Morrison Creek and extending to the confluence with the Dolores River. The stream reach is 57.94 miles in length. Approximately 20.31 miles of this reach is managed by BLM, 2.82 miles are managed by the State of Colorado, and the remaining 34.58 miles are privately owned. While this stream reach is of unusually long length for an instream flow appropriation, BLM determined that it is an appropriate length because there is no significant tributary inflow within the reach from perennial streams. In addition, channel widths remain within a consistent range throughout the reach.

Biological Summary. Disappointment Creek is a low to moderate gradient stream. In the upper half of the reach, the stream flows through a broad canyon and is confined by bedrock in numerous locations. The lower half of the reach is located within a wide valley with few bedrock constraints, allowing the stream to cut new channels during high flow events. In the upper half of the reach, substrate size ranges from gravel to small boulders. In the lower half of the reach, substrate size is generally smaller, ranging from silt to eight-inch cobbles. The upper half of the reach has a good mix of riffle, run, and pool habitat to support fish populations. The lower half of the reach has significantly fewer riffles and more pools. Water temperatures and food sources are suitable for native species.

The upper half of reach has water quality that is suitable for a wide range of fish species year-round. However, because of the geologic composition of Disappointment Valley and its groundwater flow system, the lower half of the reach has very high conductivity and salinity readings. Poor water quality in the lower reach restricts fish usage to periods of snowmelt runoff and heavy monsoonal periods, when relatively clean surface waters can dilute the poor quality associated with groundwater inflow to the creek.

Fishery surveys indicate that the creek supports spawning populations of flannemouth suckers and roundtail chub. Flannemouth sucker and roundtail chub population are known to reside are known to reside in the Dolores River. Accordingly, this tributary provides a very important extension of the flannemouth sucker and roundtail chub habitat in the Dolores River.

The creek supports a riparian community comprised of narrowleaf cottonwood, river hawthorn willows, sedges, rushes, and common reed. The riparian community has been impacted by historic grazing practices but is now on an upward trend.

R2Cross Analysis. BLM collected the following R2Cross data from Disappointment Creek. Note that data collection sites were spread throughout the reach to ensure that the full range of channel widths were captured.

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)
6/29/2016 #1	14.68 cfs	35.50 feet	Out of confidence interval	13.22 cfs
6/29/2016 #2	14.96 cfs	22.26 feet	Out of confidence interval	6.79 cfs
6/29/2016 #3	7.73 cfs	32.60 feet	8.39 cfs	9.08 cfs
6/29/2016 #4	8.02 cfs	34.00 feet	7.61 cfs	18.37 cfs

Averages: 8.00 cfs 11.87 cfs

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

11.80 cubic feet per second is recommended from March 1 through June 30, which corresponds to the period when native fishes are spawning in the creek. In most of the cross sections collected, this recommendation is driven by the average depth criteria. Given the wide channel, it is important to maintain sufficient depth to allow native species to pass through riffles to spawning locations.

8.00 cubic feet per second is recommended from July 1 through September 30. This recommendation is driven by limited water availability. However, it still meets two of the three instream flow criteria, and should provide sufficient mobility and physical habitat for fish during the highest temperature period of the year.

2.00 cubic feet per second is recommended from October 1 through February 28, the lowest temperature portion of the year. This flow rate should prevent icing in pools, maintain wet rooting zones for the riparian community, and maintain macroinvertebrate communities in the hyporheic zone below the channel bed.

Water Availability. BLM recommends using USGS gage 09168100 (Disappointment Creek near Dove Creek, CO) as an indicator of water availability. This gage had a 30-year period of record from 1957 to 1986, so it captures the full range of climate conditions that occur in the watershed. In addition, the gage record incorporates all impacts to stream flows associated with

ditch diversions and return flows that are located upstream from the gage, which includes about two thirds of the water rights within this watershed. For water availability downstream of the gage, the record can be adjusted by consulting diversion records for active ditches.

BLM is aware of the following water rights located within the recommended instream flow reach:

Horseshoe Ditch – 15.0 cfs
Disappointment Ditch – 19.94 cfs
Pine Arroyo Ditch – 6.1 cfs
Northside Ditch – 0.2 cfs
Shooting Star Pump – 0.125 cfs
Southside Ditch – 0.26 cfs
Henry M. Knight Ditch – 1.0 cfs
Knight Embling Ditch – 1.0 cfs

BLM is aware of the following water rights located upstream from the recommended reach:

Harrison Ditch – 13.4 cfs
Clark Ditch – 1.2 cfs
Evans Ditch – 3.75 cfs
Dora Ditch – 2.0 cfs
Young Ditch – 4.5 cfs
Melvin A Wastewater Ditch – 1.5 cfs
Melvin A Irrigation Ditch – 2.25 cfs

Relationship to Management Plans. The Tres Rios Management Plan specifies that BLM will work to improve riparian and aquatic conditions on stream segment managed by BLM, and will also work to prevent surface disturbances close to streams that could degrade habitat conditions. The plan also specifies that BLM will work with the Colorado Water Conservation Board to protect flow conditions in streams that support a variety of aquatic species. The stream management guidelines adopted by the plan specify that BLM will work with CWCB to maintain adequate depth, velocity, and wetted perimeter in riffle habitats.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section were included with BLM's draft recommendation in February 2017. We thank both Colorado Parks and Wildlife and the CWCB 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,

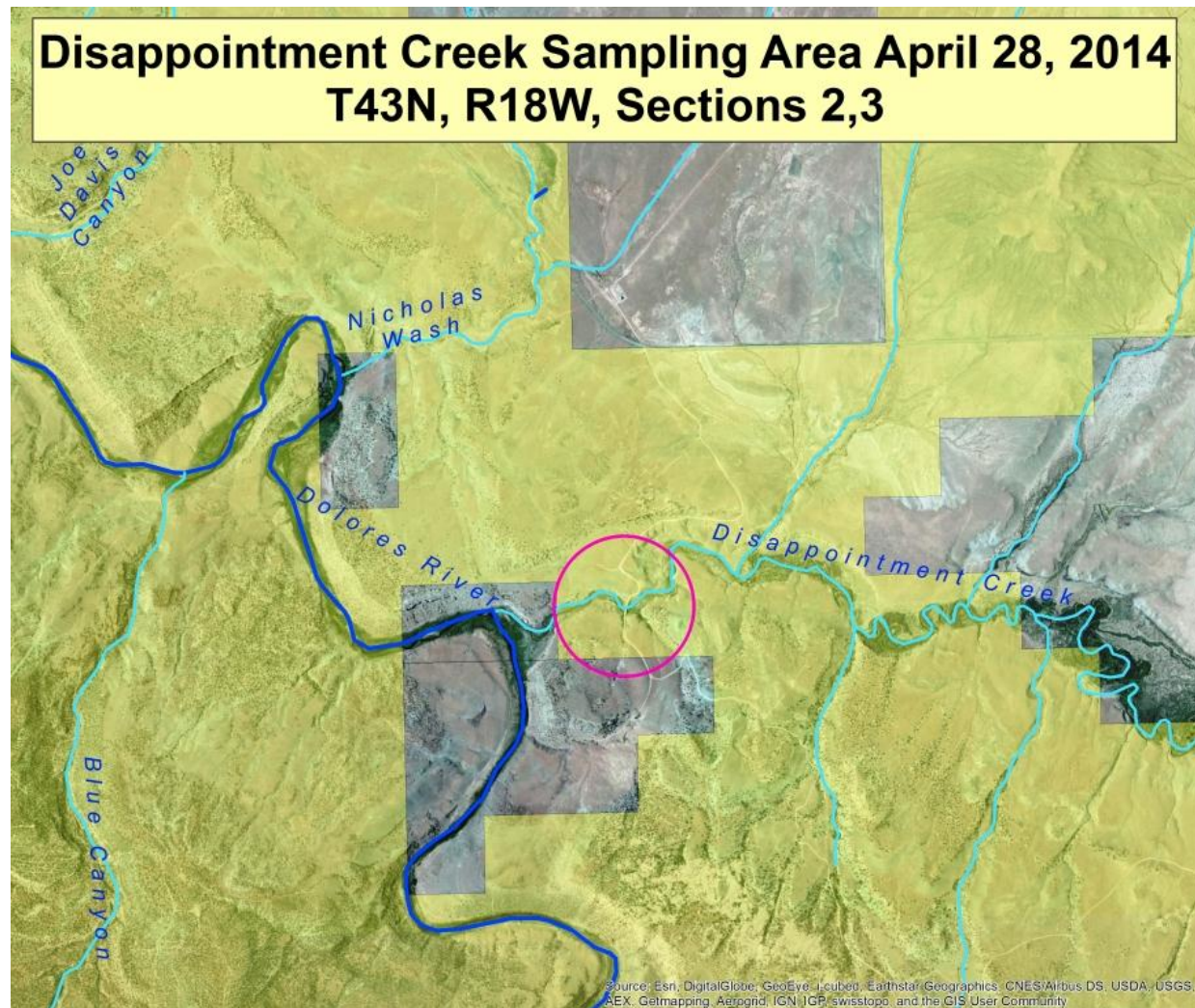
Brian St. George
Deputy State Director
Resources and Fire

cc: Connie Clementson, Tres Rios Field Office
Nate West, Tres Rios Field Office
Russ Japuntich, Southwest District

Tres Rios Field Office Stream Surveys April 2014

Disappointment Creek - Water Code #39758

Disappointment Creek, located in Southwest Colorado and located on BLM lands managed by the Tres Rios Field Office was sampled on April 28, 2014. Disappointment Creek is tributary to the Dolores River. Sampling was conducted to document adult native fish use of the stream during the spring spawning period. Disappointment Creek is known to contain flannelmouth suckers and roundtail chubs moving up and out of the Dolores River. Sampling was conducted via backpack electro-shocker. Personnel present were Tom Fresques, BLM and Kevin Thompson and Paul Jones and crew, CPW.





Adult Flannelmouth Sucker

Discussion:

The stream was running high and muddy. Efficient 2 pass removal sampling was not possible. A block seine was placed at the bottom of each small sampling event to try and capture any stunned fish. Only adult flannelmouth sucker were collected. Collected fish were in spawning condition (turbiculation on the fins).

It is apparent that this stream is used seasonally during spring high flows for spawning purposes. However, use does not appear to be of a magnitude great enough to warrant a Passive Integrated Transponder (PIT Tag) reader placement in the creek. Flannelmouth sucker spawn earliest and it could be that it was too early to detect roundtail chub and bluehead sucker use of the stream. Roundtail chubs were documented at the sample site in a May sampling event back in 2007.

Recommendations:

- Work with CPW to periodically sample the stream and monitor 3 Species use
- Continue to monitor and treat nonnative riparian vegetation along the stream

Dolores Public Lands Office Stream Surveys

May 2007

Disappointment Creek - Water Code #39758

Disappointment Creek, located in Southwest Colorado and located on BLM lands managed by the Dolores Public Lands Office was sampled on May 10, 2007. Disappointment Creek is tributary to the Dolores River. Presence/absence sampling was done in support of the Colorado BLM in-stream flow program. Sampling was conducted via backpack electro-shocker and a total of approximately 1,750 feet of stream was sampled at 3 adjoining reaches. Personnel present were Eric Freels, Tom Fresques, Mike McGuire, Aaron Kimple, and Nic Calvert.

A total of 13 fish were collected, seven flannemouth suckers and six roundtail chubs. See notes at bottom of sample sheet for other information.



Adult Flannemouth Sucker



Adult Flannelmouth Sucker



Sub-adult Flannelmouth Sucker



Adult Roundtail Chub



Sub-adult Roundtail Chub



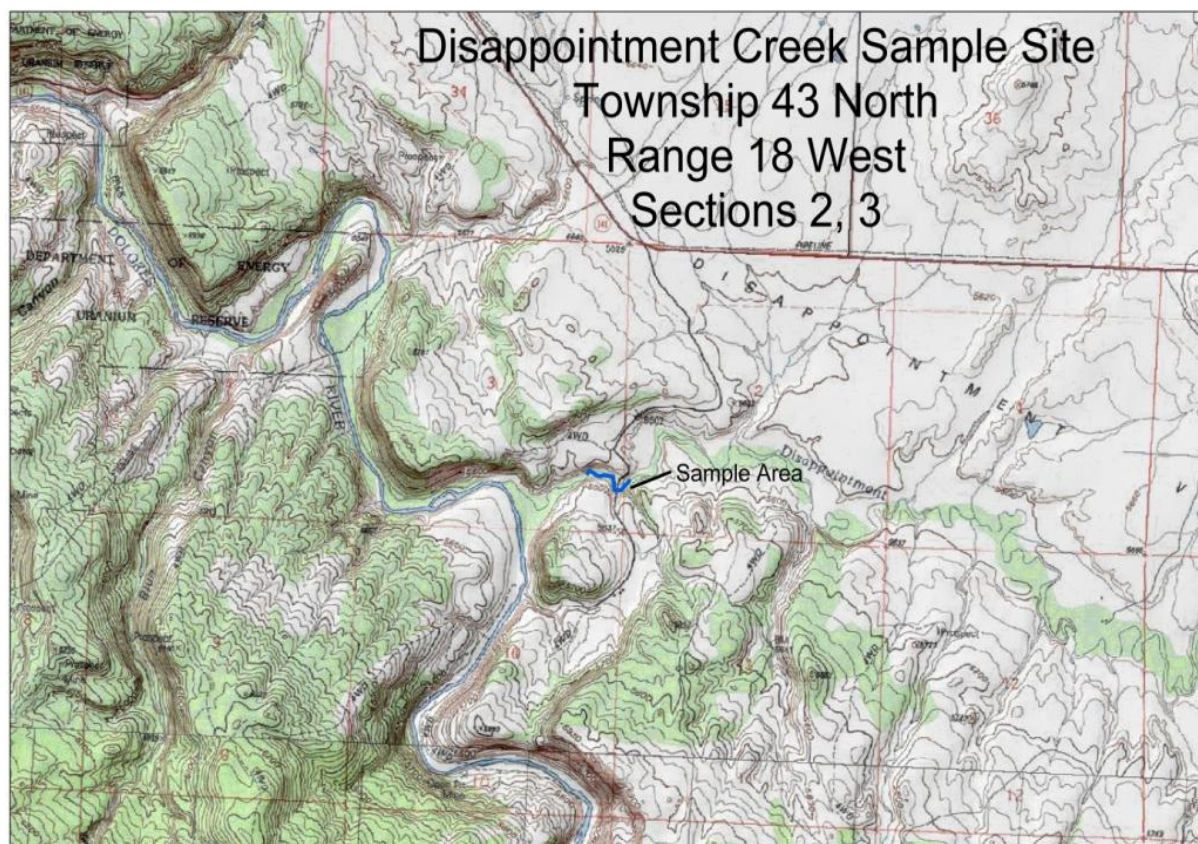
Reach 1



Reach 2



Reach 3



Map of Sample Area

STREAM SURVEY FISH SAMPLING FORM

WATER: [Disappointment Creek](#) H2O CODE: [39758](#)

DATE: [5/10/2007](#)

GEAR: [Backpack Electroshocker](#) EFFORT: [1,750 ft.](#) STATION # [1, 2, & 3](#) PASS # [1](#)

CREW: [Fresques, McGuire, Freels, Calvert, Kimple](#) DRAINAGE: [Dolores River](#)

LOCATION: [Just above confluence with Dolores River \(See map above\)](#)

species	length	weight	mark		species	length	weight	mark
Station 1								
FMS	370	-	-					
FMS	157	-	-					
FMS	470	-	-					
FMS	485	-	-					
Station 2								
FMS	428	-	-					
RTC	242	-	-					
RTC	106	-	-					
RTC	213	-	-					
RTC	157	-	-					
Station 3								
FMS	491	-	-					
FMS	445	-	-					
RTC	105	-	-					
RTC	204	-	-					

Notes: Stream Width [Average 15 ft.](#) Sample Reach [~ 1,750 ft.](#) all 3 stations.

The stream was running high and muddy. Efficient 2 pass removal sampling was not possible. A block seine was placed at the bottom of each reach and backpack shocking was conducted downstream into the net. Only one pass was completed per station. Sampling efficiency was likely poor as fish were “turned” but not netted. All fish captured were healthy and at least 2 age classes of both flannelmouth sucker and roundtail chub were collected. It is thought that these fish move up from the Dolores River during this time of year. It is unknown if any of these fish are year round residents of the stream. Some good pools were present as were cobble bottomed riffles. Based on this limited sampling we are currently uncertain of upstream distribution of fish. Based on this sampling effort, an instream flow on this creek would be valuable in maintaining sufficient water flows to sustain the fishery at least during spring/early summer when suspected fish use is occurring. We may sample the stream again this summer and see what use is occurring if any at other times of year. We may also want to determine upstream terminus of fish use at some point.



COLORADO WATER
CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



LOCATION INFORMATION

STREAM NAME: <u>Disappointment Creek</u>		CROSS-SECTION NO: <u>4</u>	
CROSS-SECTION LOCATION: <u>At BLM-private boundary below falls by 200' feet</u>			
DATE: <u>6-29-16</u>	OBSERVERS: <u>R. Smith, J. Sondergard</u>		
LEGAL DESCRIPTION	1/4 SECTION: <u>SE</u>	SECTION: <u>25</u>	TOWNSHIP: <u>42 N S</u>
		RANGE: <u>16 E/W</u>	PM: <u>N.M.</u>
COUNTY: <u>Dolores</u>	WATERSHED: <u>Dolores</u>	WATER DIVISION: <u>7</u>	DOW WATER CODE: <u>3975B</u>
MAP(S):	USGS: <u>Zone 12 713929</u>	USFS: <u>6500 A</u>	
		<u>4193804</u>	

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>mostly gravel, some boulders</u>		PHOTOGRAPHS TAKEN: ☒ YES ☐ NO	NUMBER OF PHOTOGRAPHS: <u>3</u>	

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)	SKETCH	LEGEND: Stake (X) Station (1) Photo (1) Direction of Flow (→)
(X) Tape @ Stake LB	0.0	<u>Surveyed</u>		
(X) Tape @ Stake RB	0.0	<u>Surveyed</u>		
(1) WS @ Tape LB/RB	0.0	<u>11.3 6.85 / 6.85</u>		
(2) WS Upstream	<u>52.5'</u>	<u>6.58</u>		
(3) WS Downstream	<u>54.0'</u>	<u>7.08</u>		
SLOPE	<u>0.50 / 106.5' = 0.005</u>			

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

<u>Narrowleaf cottonwood - willow riparian</u>

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: <u>Disappointment Creek</u>			CROSS-SECTION NO.: <u>4</u>	DATE: <u>6-29-16</u>	SHEET <u> </u> OF <u> </u>							
BEGINNING OF MEASUREMENT		EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE)		LEFT / RIGHT	Gage Reading: <u> </u> ft	TIME: <u>2:25 pm</u>						
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)		Area (ft ²)	Discharge (cfs)
									At Point	Mean in Vertical		
LS/G		0.0		3.67								
		8.5		5.75								
W		11.3		6.85								
		12		6.95	.1							
		12.5		7.10	.25							
		13		7.10	.25							
		13.5		7.20	.35							
		14		7.20	.35							
		14.5		7.30	.45							
		15		7.35	.50							
		15.5		7.35	.50							
		16		7.35	.50							
		16.5		7.30	.45							
		17		7.30	.45							
		17.5		7.35	.50							
		18		7.30	.45							
		18.5		7.30	.45							
		19		7.30	.45							
		19.5		7.35	.5							
		20		7.40	.55							
		20.5		7.35	.5							
		21		7.25	.4							
		21.5		7.15	.3							
		22		7.15	.3							
		23		7.05	.2							
		24		7.05	.2							
		25		7.20	.35							
		25.5		7.25	.40							
		26		7.25	.40							
		26.5		7.20	.35							
		27		7.05	.20							
W		27.4		6.85								
		30.7		5.80								
RS/G		34.0		3.67								
TOTALS:												
End of Measurement		Time:	Gage Reading: <u> </u> ft		CALCULATIONS PERFORMED BY:				CALCULATIONS CHECKED BY:			

Narrowleaf Cottonwood - willow riparian
Temp = 25.7°C Cond = 470
pH = 8.0 Salinity = 0.2
Few microbes

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:		CROSS-SECTION NO.:		DATE:		SHEET ____ OF ____						
BEGINNING OF MEASUREMENT		EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE)		LEFT / RIGHT		Gage Reading: _____ ft		TIME: 1:00 pm				
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)		Area (ft ²)	Discharge (cfs)
									At Point	Mean in Vertical		
LS/G		0.0		2.70								
		2.5		4.70								
W		3.7		5.40	φ				φ			
		4		5.5	.1				.01			
		4.5		5.85	.45				1.14			
		5		5.85	.45				1.72			
		5.5		5.85	.45				2.46			
		6		5.85	.45				2.64			
		6.5		6.0	.60				2.50			
		7		6.0	.60				2.10			
		7.5		6.05	.65				1.90			
		8		6.0	.60				1.65			
		8.5		6.0	.60				1.62			
		9		6.0	.60				1.15			
		9.5		5.9	.5				2.09			
		10		5.8	.4				1.34			
		10.5		5.9	.5				1.22			
11.5 >		11	5.6 >	5.85	.45	<.2			1.72			
		12		5.70	.3				1.32		2.43	
		13		5.65	.25				1.15			
		14		5.60	.20				0.67			
		15		5.60	.20				0.53			
		16		5.50	.10				0.66			
		17		5.50	.10				φ			
		18		5.45	.05				φ			
		19		5.45	.05				φ			
		20		5.45	.05				φ			
W		20.4		5.40	φ				φ			
		29.7		4.53								
RS/G		32.6		2.70								
				2.35								
TOTALS:												
End of Measurement		Time:		Gage Reading: _____ ft		CALCULATIONS PERFORMED BY:				CALCULATIONS CHECKED BY:		



FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



COLORADO WATER
CONSERVATION BOARD

LOCATION INFORMATION

STREAM NAME: <u>Disappointment Creek</u>		CROSS-SECTION NO.: <u>2</u>	
CROSS-SECTION LOCATION: <u>Approx. 300' upstream from county road bridge</u>			
DATE: <u>6-29-16</u>	OBSERVERS: <u>R. Smith, J. Sondergard</u>		
LEGAL DESCRIPTION:	1/4 SECTION: <u>SW</u>	SECTION: <u>2</u>	TOWNSHIP: <u>43N S</u>
		RANGE: <u>18 E W</u>	PM: <u>N.M.</u>
COUNTY: <u>San Miguel</u>	WATERSHED: <u>Dolores</u>	WATER DIVISION: <u>7</u>	DOW WATER CODE: <u>39758</u>
MAP(S):	USGS: <u>690502</u>		
	USFS: <u>4209624</u>		

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>silt to 8" cobbles</u>		PHOTOGRAPHS TAKEN: YES/NO <u>0</u>	NUMBER OF PHOTOGRAPHS: <u>0</u>

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)	SKETCH	LEGEND:
⊗ Tape @ Stake LB	0.0	<u>surveyed</u>		
⊗ Tape @ Stake RB	0.0	<u>surveyed</u>		
① WS @ Tape LB/RB	0.0 <u>2.3</u>	<u>10.1 / 10.1</u>		
② WS Upstream	<u>1.0'</u>	<u>10.09</u>		
③ WS Downstream	<u>80.0'</u>	<u>10.46</u>		
SLOPE	<u>0.37 / 81.1' = 0.0045</u>			

TAPE

22.8

③

①

②

Stake ⊗

Station ①

Photo ①

Direction of Flow →

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO <u>0</u>	DISTANCE ELECTROFISHED: _____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO <u>0</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:																	

COMMENTS

<u>Cond = 2963</u>
<u>Salinity = 1.6 ppt</u>
<u>Temp = 21.0 C</u>
<u>pH = 7.47</u>

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:						CROSS-SECTION NO.: _____	DATE: _____			
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE)							Gage Reading: _____ ft	TIME: _____ am/pm	
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 Mean in Vertical	Area (ft²)	Discharge (cfs)
L5/G	0.0		7.57							
	1.6		9.30							
W	2.3		10.1							
	3		10.6	.5				0.45		
4.5 >	4	10.6 >	10.65	.55	<.5			1.64	<1.66	
	5		10.60	.5				2.44		
	6		10.50	.4				1.84		
	7		10.50	.4				2.20		
	8		10.65	.55				2.73		
9.5 >	9	10.7 >	10.7	.6	<.6			2.28	<2.16	
	10		10.6	.50				2.72		
	11		10.6	.50				2.38		
	12		10.6	.50				2.28		
	13		10.65	.55				1.78		
	14		10.65	.55				1.59		
	15		10.60	.50				2.02		
	16		10.50	.40				1.87		
	17		10.40	.30				0.57		
	18		10.30	.20				1.49		
	19		10.30	.20				1.23		
	20		10.35	.25				0.95		
	21		10.30	.20				0.20		
	22		10.20	.10				Ø		
TOTALS:										
End of Measurement	Time.	Gage Reading: _____ ft	CALCULATIONS PERFORMED BY:				CALCULATIONS CHECKED BY:			



FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



COLORADO WATER
CONSERVATION BOARD

LOCATION INFORMATION

STREAM NAME: <u>Disappointment Creek</u>				CROSS-SECTION NO.: <u>1</u>	
CROSS-SECTION LOCATION: <u>Approx. 1500 ft. upstream from county road bridge</u>					
DATE: <u>6-29-16</u>		OBSERVERS: <u>R. Smith, J. Sandergard</u>			
LEGAL DESCRIPTION	1/4 SECTION: <u>SW</u>	SECTION: <u>2</u>	TOWNSHIP: <u>43N</u>	RANGE: <u>18 E</u>	PM: <u>N.M.</u>
COUNTY: <u>San Miguel</u>	WATERSHED: <u>Dolores</u>		WATER DIVISION: <u>7</u>	DOW WATER CODE: <u>39758</u>	
MAP(S):	USGS: <u>Zone 12 690603</u>		<u>5528 ft.</u>		
	USFS: <u>4209687</u>				

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	TAPE TENSION:	lbs
CHANNEL BED MATERIAL SIZE RANGE:				PHOTOGRAPHS TAKEN: YES/NO		NUMBER OF PHOTOGRAPHS:			
5 1/2 to 6" cobbles				YES/NO		none			

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	4.1 - 7.85 / 7.85
②	WS Upstream	11.8	7.74
③	WS Downstream	27.0	8.49
SLOPE		0.75 / 35.8 = 0.019	

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

Riparian = willow, cottonwood, phragmites
Very high suspended sediment load.

DISCHARGE/CROSS SECTION NOTES

[illegible]

Data Input & Proofing

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary 200 ft below falls
 XS NUMBER: 4
 DATE: 6/29/2016
 OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SE
 SECTION: 25
 TWP: 42N
 RANGE: 16W
 PM: New Mexico

COUNTY: Dolores
 WATERSHED: Dolores River
 DIVISION: 7
 DOW CODE: 39758
 USGS MAP:
 USFS MAP:

TAPE WT: 0.0106 Level and Rod Survey lbs / ft
 TENSION: 99999 lbs

SLOPE: 0.005 ft / ft

CHECKED BY:.....DATE.....

ASSIGNED TO:DATE.....

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
Total Data Points = 34								
1	LS & G	0.00	3.67			0.00	0.00	0.00
		8.50	5.75			0.00	0.00	0.00
		11.30	6.85	0.00	0.00	0.00	0.00	0.00
		12.00	6.95	0.10	0.00	0.06	0.00	6.85
		12.50	7.10	0.25	0.22	0.13	0.03	6.85
		13.00	7.10	0.25	0.58	0.13	0.07	6.85
		13.50	7.20	0.35	0.65	0.18	0.11	6.85
		14.00	7.20	0.35	0.84	0.18	0.15	6.85
		14.50	7.30	0.45	1.21	0.23	0.27	6.85
		15.00	7.35	0.50	1.67	0.25	0.42	6.85
		15.50	7.35	0.50	1.91	0.25	0.48	6.85
		16.00	7.35	0.50	2.01	0.25	0.50	6.85
		16.50	7.30	0.45	1.85	0.23	0.42	6.85
		17.00	7.30	0.45	1.70	0.23	0.38	6.85
		17.50	7.35	0.50	1.59	0.25	0.40	6.85
		18.00	7.30	0.45	1.82	0.23	0.41	6.85
		18.50	7.30	0.45	1.94	0.23	0.44	6.85
		19.00	7.30	0.45	1.84	0.23	0.41	6.85
		19.50	7.35	0.50	0.71	0.25	0.18	6.85
		20.00	7.40	0.55	1.74	0.28	0.48	6.85
		20.50	7.35	0.50	1.96	0.25	0.49	6.85
		21.00	7.25	0.40	1.75	0.20	0.35	6.85
		21.50	7.15	0.30	1.56	0.15	0.23	6.85
		22.00	7.15	0.30	1.47	0.23	0.33	6.85
		23.00	7.05	0.20	0.93	0.20	0.19	6.85
		24.00	7.05	0.20	0.79	0.20	0.16	6.85
		25.00	7.20	0.35	0.99	0.26	0.26	6.85
		25.50	7.25	0.40	1.40	0.20	0.28	6.85
		26.00	7.25	0.40	1.58	0.20	0.32	6.85
		26.50	7.20	0.35	1.44	0.18	0.25	6.85
		27.00	7.05	0.20	0.19	0.09	0.02	6.85
	W	27.40	6.85	0.00	0.00	0.00	0.00	0.00
		30.70	5.80			0.00	0.00	0.00
1	RS & G	34.00	3.67			0.00	0.00	0.00

Totals	5.69	8.02
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COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Disappointment Creek
XS LOCATION: BLM-Private boundary 200 ft below falls
XS NUMBER: 4

DATE: 29-Jun-16
OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SE
SECTION: 25
TWP: 42N
RANGE: 16W
PM: New Mexico

COUNTY: Dolores
WATERSHED: Dolores River
DIVISION: 7
DOW CODE: 39758

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: 0.005

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary 200 ft below falls
 XS NUMBER: 4

DATA POINTS= 34

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 LS & G	0.00	3.67		
	8.50	5.75		
W	11.30	6.85	0.00	0.00
	12.00	6.95	0.10	0.00
	12.50	7.10	0.25	0.22
	13.00	7.10	0.25	0.58
	13.50	7.20	0.35	0.65
	14.00	7.20	0.35	0.84
	14.50	7.30	0.45	1.21
	15.00	7.35	0.50	1.67
	15.50	7.35	0.50	1.91
	16.00	7.35	0.50	2.01
	16.50	7.30	0.45	1.85
	17.00	7.30	0.45	1.70
	17.50	7.35	0.50	1.59
	18.00	7.30	0.45	1.82
	18.50	7.30	0.45	1.94
	19.00	7.30	0.45	1.84
	19.50	7.35	0.50	0.71
	20.00	7.40	0.55	1.74
	20.50	7.35	0.50	1.96
	21.00	7.25	0.40	1.75
	21.50	7.15	0.30	1.56
	22.00	7.15	0.30	1.47
	23.00	7.05	0.20	0.93
	24.00	7.05	0.20	0.79
	25.00	7.20	0.35	0.99
	25.50	7.25	0.40	1.40
	26.00	7.25	0.40	1.58
	26.50	7.20	0.35	1.44
	27.00	7.05	0.20	0.19
W	27.40	6.85	0.00	0.00
	30.70	5.80		
1 RS & G	34.00	3.67		

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%
0.71	0.10	0.06	0.00	0.0%
0.52	0.25	0.13	0.03	0.3%
0.50	0.25	0.13	0.07	0.9%
0.51	0.35	0.18	0.11	1.4%
0.50	0.35	0.18	0.15	1.8%
0.51	0.45	0.23	0.27	3.4%
0.50	0.50	0.25	0.42	5.2%
0.50	0.50	0.25	0.48	6.0%
0.50	0.50	0.25	0.50	6.3%
0.50	0.45	0.23	0.42	5.2%
0.50	0.45	0.23	0.38	4.8%
0.50	0.50	0.25	0.40	5.0%
0.50	0.45	0.23	0.41	5.1%
0.50	0.45	0.23	0.44	5.4%
0.50	0.45	0.23	0.41	5.2%
0.50	0.50	0.25	0.18	2.2%
0.50	0.55	0.28	0.48	6.0%
0.50	0.50	0.25	0.49	6.1%
0.51	0.40	0.20	0.35	4.4%
0.51	0.30	0.15	0.23	2.9%
0.50	0.30	0.23	0.33	4.1%
1.00	0.20	0.20	0.19	2.3%
1.00	0.20	0.20	0.16	2.0%
1.01	0.35	0.26	0.26	3.2%
0.50	0.40	0.20	0.28	3.5%
0.50	0.40	0.20	0.32	3.9%
0.50	0.35	0.18	0.25	3.1%
0.52	0.20	0.09	0.02	0.2%
0.45		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

TOTALS -----

16.28 0.55 5.69 8.02 100.0%
 (Max.)

Manning's n = 0.0370
 Hydraulic Radius= 0.34942849

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary 200 ft below falls
 XS NUMBER: 4

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	5.69	5.69	0.0%
6.60	5.69	9.89	73.9%
6.62	5.69	9.54	67.8%
6.64	5.69	9.19	61.7%
6.66	5.69	8.85	55.6%
6.68	5.69	8.51	49.6%
6.70	5.69	8.17	43.6%
6.72	5.69	7.83	37.6%
6.74	5.69	7.49	31.7%
6.76	5.69	7.16	25.9%
6.78	5.69	6.83	20.1%
6.80	5.69	6.50	14.3%
6.81	5.69	6.34	11.4%
6.82	5.69	6.17	8.5%
6.83	5.69	6.01	5.7%
6.84	5.69	5.85	2.8%
6.85	5.69	5.69	0.0%
6.86	5.69	5.53	-2.8%
6.87	5.69	5.37	-5.6%
6.88	5.69	5.21	-8.4%
6.89	5.69	5.05	-11.2%
6.90	5.69	4.89	-14.0%
6.92	5.69	4.58	-19.4%
6.94	5.69	4.27	-24.8%
6.96	5.69	3.97	-30.2%
6.98	5.69	3.67	-35.5%
7.00	5.69	3.37	-40.8%
7.02	5.69	3.07	-46.0%
7.04	5.69	2.78	-51.2%
7.06	5.69	2.49	-56.2%
7.08	5.69	2.23	-60.8%
7.10	5.69	1.98	-65.3%

WATERLINE AT ZERO

AREA ERROR = 6.850

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary 200 ft below falls
 XS NUMBER: 4

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	3.67	34.00	2.51	3.73	85.37	35.43	100.0%	2.41	435.95	5.11
	5.85	21.79	1.13	1.55	24.63	22.31	63.0%	1.10	74.76	3.04
	5.90	21.50	1.10	1.50	23.55	22.01	62.1%	1.07	70.00	2.97
	5.95	21.22	1.06	1.45	22.48	21.71	61.3%	1.04	65.39	2.91
	6.00	20.94	1.02	1.40	21.43	21.40	60.4%	1.00	60.92	2.84
	6.05	20.65	0.99	1.35	20.39	21.10	59.6%	0.97	56.61	2.78
	6.10	20.37	0.95	1.30	19.36	20.80	58.7%	0.93	52.45	2.71
	6.15	20.08	0.91	1.25	18.35	20.50	57.9%	0.90	48.43	2.64
	6.20	19.80	0.88	1.20	17.35	20.20	57.0%	0.86	44.56	2.57
	6.25	19.51	0.84	1.15	16.37	19.90	56.2%	0.82	40.84	2.49
	6.30	19.23	0.80	1.10	15.40	19.59	55.3%	0.79	37.27	2.42
	6.35	18.94	0.76	1.05	14.45	19.29	54.5%	0.75	33.85	2.34
	6.40	18.66	0.72	1.00	13.51	18.99	53.6%	0.71	30.58	2.26
	6.45	18.38	0.68	0.95	12.58	18.69	52.8%	0.67	27.46	2.18
	6.50	18.09	0.65	0.90	11.67	18.39	51.9%	0.63	24.49	2.10
	6.55	17.81	0.61	0.85	10.77	18.09	51.1%	0.60	21.67	2.01
	6.60	17.52	0.56	0.80	9.89	17.78	50.2%	0.56	19.00	1.92
	6.65	17.24	0.52	0.75	9.02	17.48	49.4%	0.52	16.49	1.83
	6.70	16.95	0.48	0.70	8.17	17.18	48.5%	0.48	14.13	1.73
	6.75	16.67	0.44	0.65	7.33	16.88	47.6%	0.43	11.93	1.63
	6.80	16.38	0.40	0.60	6.50	16.58	46.8%	0.39	9.89	1.52
WL	6.85	16.10	0.35	0.55	5.69	16.28	45.9%	0.35	8.02	1.41
	6.90	15.65	0.31	0.50	4.89	15.81	44.6%	0.31	6.36	1.30
	6.95	15.20	0.27	0.45	4.12	15.35	43.3%	0.27	4.88	1.18
	7.00	14.93	0.23	0.40	3.37	15.06	42.5%	0.22	3.53	1.05
	7.05	13.67	0.19	0.35	2.63	13.77	38.9%	0.19	2.48	0.94
	7.10	12.00	0.16	0.30	1.98	12.09	34.1%	0.16	1.68	0.85
	7.15	10.25	0.14	0.25	1.41	10.32	29.1%	0.14	1.06	0.75
	7.20	8.75	0.11	0.20	0.92	8.80	24.8%	0.10	0.58	0.63
	7.25	6.75	0.08	0.15	0.52	6.78	19.1%	0.08	0.27	0.51
	7.30	4.75	0.04	0.10	0.19	4.77	13.5%	0.04	0.07	0.34
	7.35	1.00	0.03	0.05	0.03	1.01	2.8%	0.02	0.01	0.24
	7.40	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: Disappointment Creek
XS LOCATION: BLM-Private boundary 200 ft below falls
XS NUMBER: 4

SUMMARY SHEET

MEASURED FLOW (Qm)= 8.02 cfs
CALCULATED FLOW (Qc)= 8.02 cfs
(Qm-Qc)/Qm * 100 = 0.0 %

MEASURED WATERLINE (WLm)= 6.85 ft
CALCULATED WATERLINE (WLc)= 6.85 ft
(WLm-WLc)/WLm * 100 = 0.0 %

MAX MEASURED DEPTH (Dm)= 0.55 ft
MAX CALCULATED DEPTH (Dc)= 0.55 ft
(Dm-Dc)/Dm * 100 = 0.0 %

MEAN VELOCITY= 1.41 ft/sec
MANNING'S N= 0.037
SLOPE= 0.005 ft/ft

.4 * Qm = 3.2 cfs
2.5 * Qm= 20.0 cfs

RECOMMENDED INSTREAM FLOW:
=====

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

RATIONALE FOR RECOMMENDATION:
=====

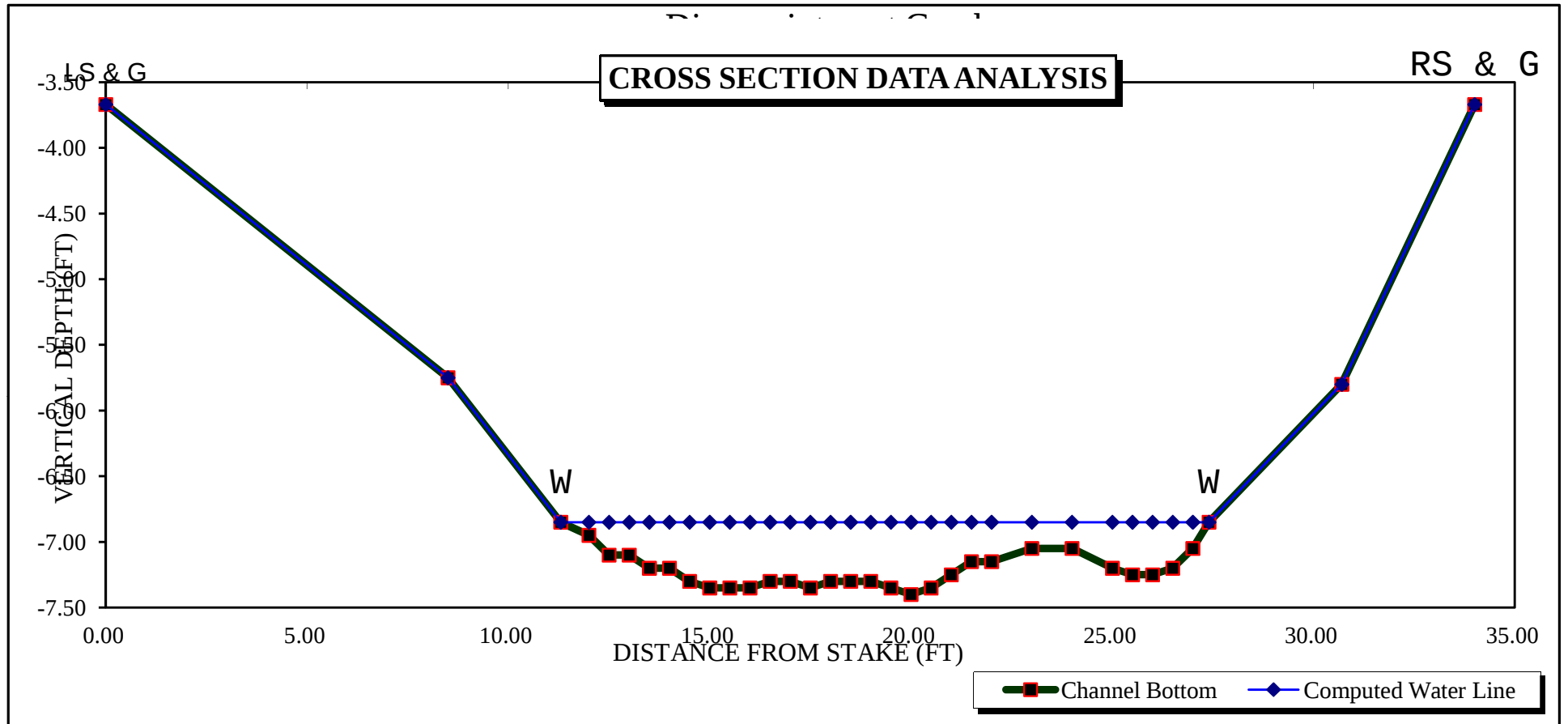
RECOMMENDATION BY: AGENCY..... DATE:.....
CWCB REVIEW BY: DATE:.....

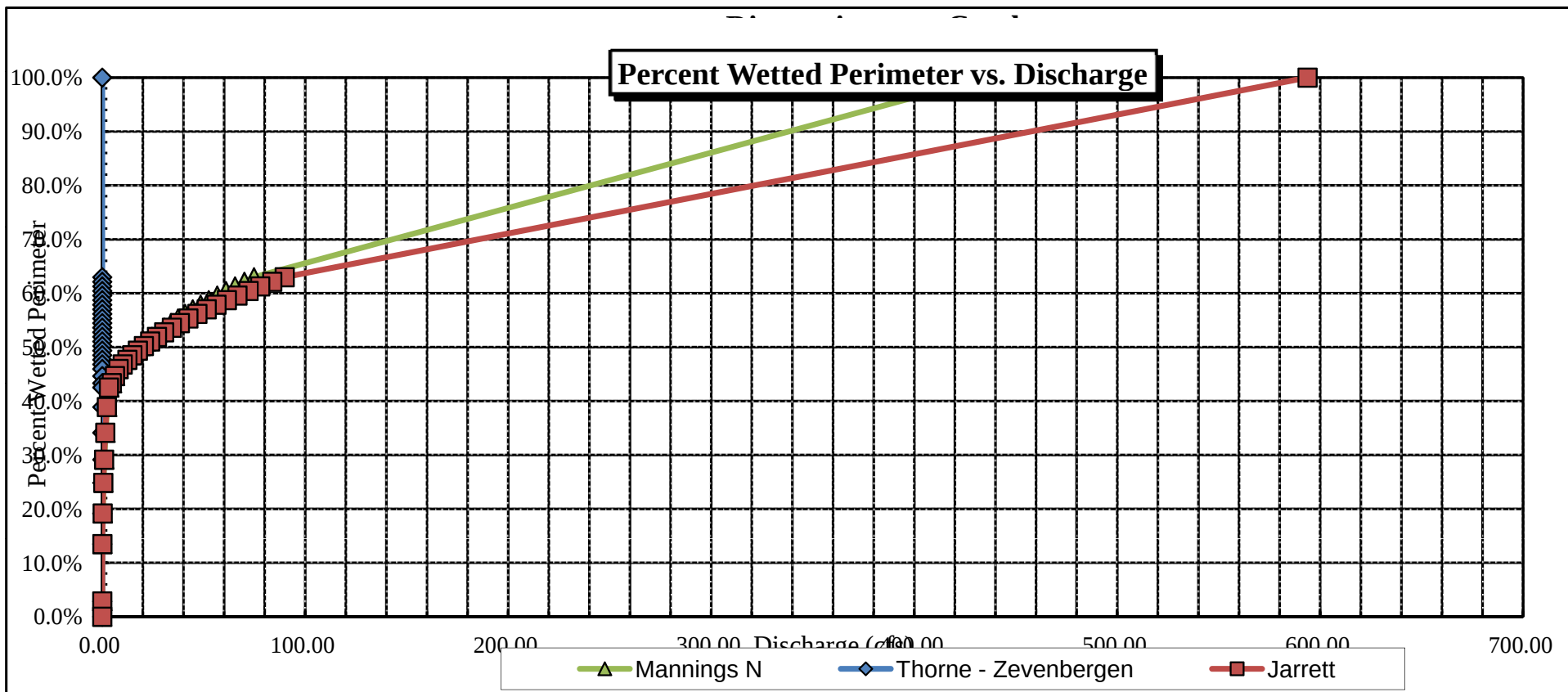
STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary 200 ft below falls
 XS NUMBER: 4 Jarrett Variable Manning's n Correction Applied

GL = lowest Grassline elevation corrected for sag

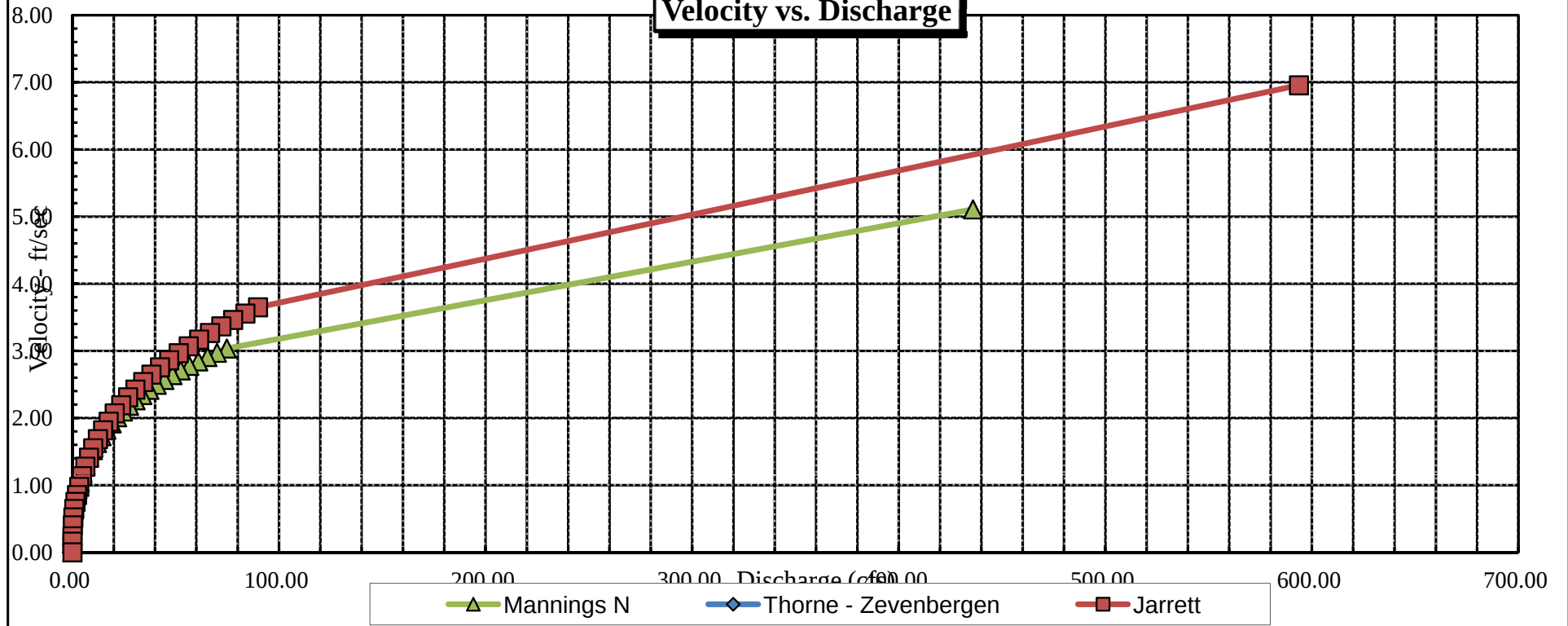
STAGING TABLE *WL* = Waterline corrected for variations in field measured water surface elevations and sag

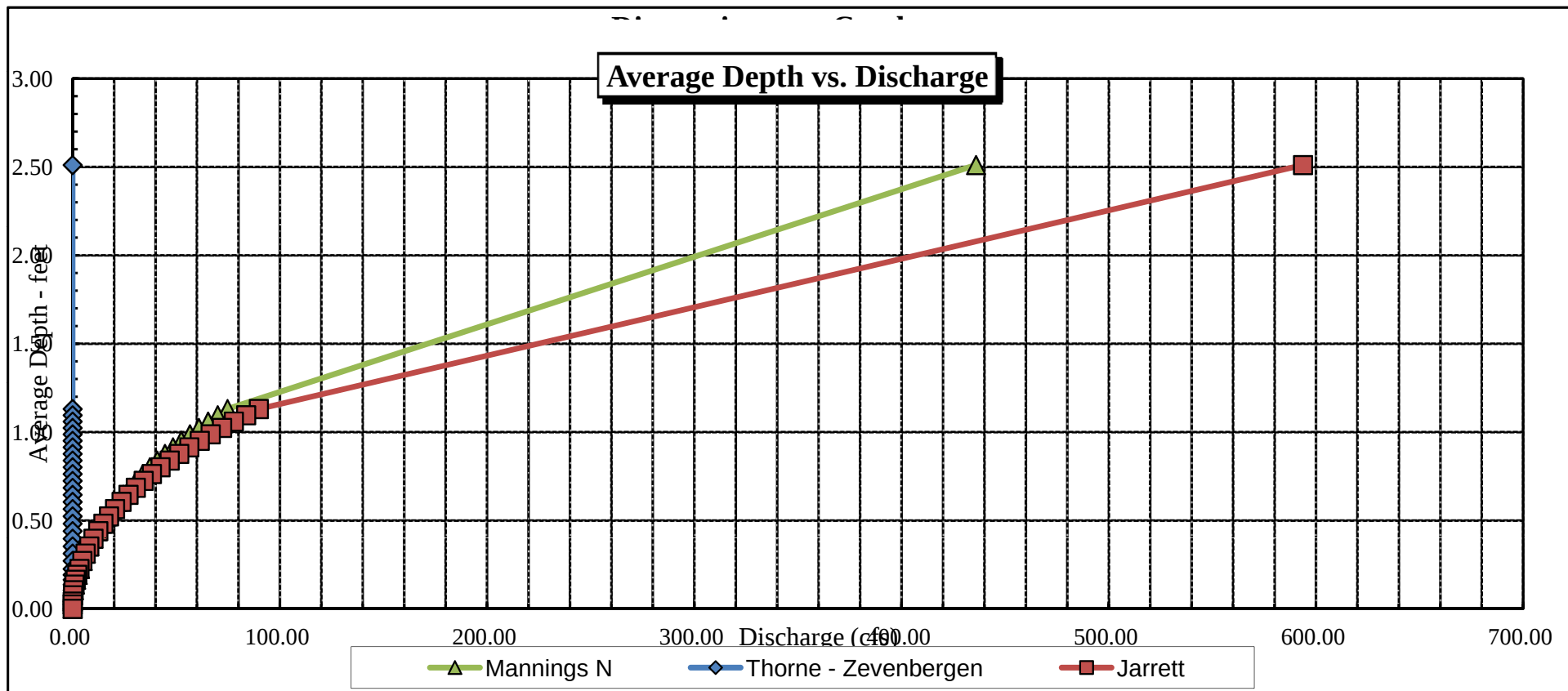
	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	3.67	34.00	2.51	3.73	85.37	35.43	100.0%	2.41	593.77	6.96
	5.85	21.79	1.13	1.55	24.63	22.31	63.0%	1.10	89.87	3.65
	5.90	21.50	1.10	1.50	23.55	22.01	62.1%	1.07	83.72	3.56
	5.95	21.22	1.06	1.45	22.48	21.71	61.3%	1.04	77.80	3.46
	6.00	20.94	1.02	1.40	21.43	21.40	60.4%	1.00	72.10	3.36
	6.05	20.65	0.99	1.35	20.39	21.10	59.6%	0.97	66.61	3.27
	6.10	20.37	0.95	1.30	19.36	20.80	58.7%	0.93	61.35	3.17
	6.15	20.08	0.91	1.25	18.35	20.50	57.9%	0.90	56.30	3.07
	6.20	19.80	0.88	1.20	17.35	20.20	57.0%	0.86	51.46	2.97
	6.25	19.51	0.84	1.15	16.37	19.90	56.2%	0.82	46.84	2.86
	6.30	19.23	0.80	1.10	15.40	19.59	55.3%	0.79	42.44	2.76
	6.35	18.94	0.76	1.05	14.45	19.29	54.5%	0.75	38.25	2.65
	6.40	18.66	0.72	1.00	13.51	18.99	53.6%	0.71	34.27	2.54
	6.45	18.38	0.68	0.95	12.58	18.69	52.8%	0.67	30.50	2.42
	6.50	18.09	0.65	0.90	11.67	18.39	51.9%	0.63	26.94	2.31
	6.55	17.81	0.61	0.85	10.77	18.09	51.1%	0.60	23.60	2.19
	6.60	17.52	0.56	0.80	9.89	17.78	50.2%	0.56	20.47	2.07
	6.65	17.24	0.52	0.75	9.02	17.48	49.4%	0.52	17.55	1.95
	6.70	16.95	0.48	0.70	8.17	17.18	48.5%	0.48	14.84	1.82
	6.75	16.67	0.44	0.65	7.33	16.88	47.6%	0.43	12.35	1.69
	6.80	16.38	0.40	0.60	6.50	16.58	46.8%	0.39	10.08	1.55
WL	6.85	16.10	0.35	0.55	5.69	16.28	45.9%	0.35	8.02	1.41
	6.90	15.65	0.31	0.50	4.89	15.81	44.6%	0.31	6.24	1.27
	6.95	15.20	0.27	0.45	4.12	15.35	43.3%	0.27	4.68	1.13
	7.00	14.93	0.23	0.40	3.37	15.06	42.5%	0.22	3.28	0.97
	7.05	13.67	0.19	0.35	2.63	13.77	38.9%	0.19	2.25	0.85
	7.10	12.00	0.16	0.30	1.98	12.09	34.1%	0.16	1.49	0.75
	7.15	10.25	0.14	0.25	1.41	10.32	29.1%	0.14	0.91	0.65
	7.20	8.75	0.11	0.20	0.92	8.80	24.8%	0.10	0.48	0.52
	7.25	6.75	0.08	0.15	0.52	6.78	19.1%	0.08	0.21	0.40
	7.30	4.75	0.04	0.10	0.19	4.77	13.5%	0.04	0.05	0.24
	7.35	1.00	0.03	0.05	0.03	1.01	2.8%	0.02	0.00	0.16
	7.40	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!



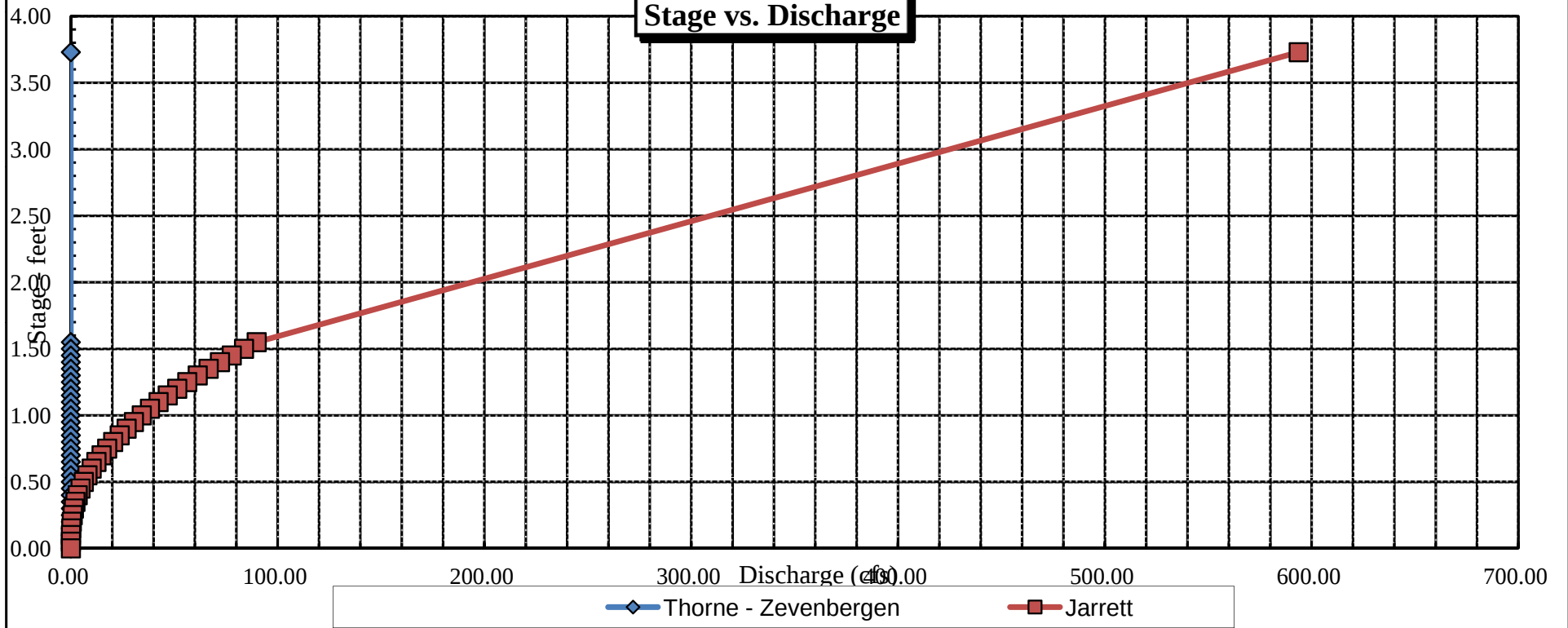


Velocity vs. Discharge





Stage vs. Discharge



Data Input & Proofing

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary near old gage
 XS NUMBER: 3
 DATE: 6/29/2016
 OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SE
 SECTION: 25
 TWP: 42N
 RANGE: 16W
 PM: New Mexico

COUNTY: Dolores
 WATERSHED: Dolores River
 DIVISION: 7
 DOW CODE: 39758
 USGS MAP:
 USFS MAP:

TAPE WT: 0.0106 Level and Rod Survey lbs / ft
 TENSION: 99999 lbs

SLOPE: 0.0054 ft / ft

CHECKED BY:.....DATE.....

ASSIGNED TO:DATE.....

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
Total Data Points = 31								
1	LS & G	0.00	2.70			0.00	0.00	0.00
		2.50	4.70			0.00	0.00	0.00
		3.70	5.40	0.00	0.00	0.00	0.00	0.00
		4.00	5.50	0.10	0.01	0.04	0.00	5.40
		4.50	5.85	0.45	1.14	0.23	0.26	5.40
		5.00	5.85	0.45	1.72	0.23	0.39	5.40
		5.50	5.85	0.45	2.46	0.23	0.55	5.40
		6.00	5.85	0.45	2.64	0.23	0.59	5.40
		6.50	6.00	0.60	2.50	0.30	0.75	5.40
		7.00	6.00	0.60	2.10	0.30	0.63	5.40
		7.50	6.05	0.65	1.90	0.33	0.62	5.40
		8.00	6.00	0.60	1.65	0.30	0.50	5.40
		8.50	6.00	0.60	1.62	0.30	0.49	5.40
		9.00	6.00	0.60	1.15	0.30	0.35	5.40
		9.50	5.90	0.50	2.09	0.25	0.52	5.40
		10.00	5.80	0.40	1.34	0.20	0.27	5.40
		10.50	5.90	0.50	1.22	0.25	0.31	5.40
		11.00	5.85	0.45	1.72	0.23	0.39	5.40
		11.50	5.60	0.20	2.43	0.10	0.24	5.40
		12.00	5.70	0.30	1.32	0.23	0.30	5.40
1	W	13.00	5.65	0.25	1.15	0.25	0.29	5.40
		14.00	5.60	0.20	0.67	0.20	0.13	5.40
		15.00	5.60	0.20	0.53	0.20	0.11	5.40
		16.00	5.50	0.10	0.66	0.10	0.07	5.40
		17.00	5.50	0.10	0.00	0.10	0.00	5.40
		18.00	5.45	0.05	0.00	0.05	0.00	5.40
		19.00	5.45	0.05	0.00	0.05	0.00	5.40
		20.00	5.45	0.05	0.00	0.04	0.00	5.40
		20.40	5.40	0.00	0.00	0.00	0.00	0.00
		29.70	4.53			0.00	0.00	0.00
1	RS & G	32.60	2.70			0.00	0.00	0.00

Totals	5.00	7.73
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COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Disappointment Creek
XS LOCATION: BLM-Private boundary near old gage
XS NUMBER: 3

DATE: 29-Jun-16
OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SE
SECTION: 25
TWP: 42N
RANGE: 16W
PM: New Mexico

COUNTY: Dolores
WATERSHED: Dolores River
DIVISION: 7
DOW CODE: 39758

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: 0.0054

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary near old gage
 XS NUMBER: 3

DATA POINTS= 31

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 LS & G	0.00	2.70		
	2.50	4.70		
W	3.70	5.40	0.00	0.00
	4.00	5.50	0.10	0.01
	4.50	5.85	0.45	1.14
	5.00	5.85	0.45	1.72
	5.50	5.85	0.45	2.46
	6.00	5.85	0.45	2.64
	6.50	6.00	0.60	2.50
	7.00	6.00	0.60	2.10
	7.50	6.05	0.65	1.90
	8.00	6.00	0.60	1.65
	8.50	6.00	0.60	1.62
	9.00	6.00	0.60	1.15
	9.50	5.90	0.50	2.09
	10.00	5.80	0.40	1.34
	10.50	5.90	0.50	1.22
	11.00	5.85	0.45	1.72
	11.50	5.60	0.20	2.43
	12.00	5.70	0.30	1.32
	13.00	5.65	0.25	1.15
	14.00	5.60	0.20	0.67
	15.00	5.60	0.20	0.53
	16.00	5.50	0.10	0.66
	17.00	5.50	0.10	0.00
	18.00	5.45	0.05	0.00
	19.00	5.45	0.05	0.00
	20.00	5.45	0.05	0.00
W	20.40	5.40	0.00	0.00
	29.70	4.53		
1 RS & G	32.60	2.70		

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%
0.32	0.10	0.04	0.00	0.0%
0.61	0.45	0.23	0.26	3.3%
0.50	0.45	0.23	0.39	5.0%
0.50	0.45	0.23	0.55	7.2%
0.50	0.45	0.23	0.59	7.7%
0.52	0.60	0.30	0.75	9.7%
0.50	0.60	0.30	0.63	8.1%
0.50	0.65	0.33	0.62	8.0%
0.50	0.60	0.30	0.50	6.4%
0.50	0.60	0.30	0.49	6.3%
0.50	0.60	0.30	0.35	4.5%
0.51	0.50	0.25	0.52	6.8%
0.51	0.40	0.20	0.27	3.5%
0.51	0.50	0.25	0.31	3.9%
0.50	0.45	0.23	0.39	5.0%
0.56	0.20	0.10	0.24	3.1%
0.51	0.30	0.23	0.30	3.8%
1.00	0.25	0.25	0.29	3.7%
1.00	0.20	0.20	0.13	1.7%
1.00	0.20	0.20	0.11	1.4%
1.00	0.10	0.10	0.07	0.9%
1.00	0.10	0.10	0.00	0.0%
1.00	0.05	0.05	0.00	0.0%
1.00	0.05	0.05	0.00	0.0%
1.00	0.05	0.04	0.00	0.0%
0.40		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

TOTALS -----

16.97 0.65 5.00 7.73 100.0%
 (Max.)

Manning's n = 0.0313
 Hydraulic Radius= 0.29469794

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary near old gage
 XS NUMBER: 3

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	5.00	5.00	0.0%
5.15	5.00	9.56	91.3%
5.17	5.00	9.17	83.4%
5.19	5.00	8.78	75.6%
5.21	5.00	8.40	67.9%
5.23	5.00	8.02	60.4%
5.25	5.00	7.64	52.9%
5.27	5.00	7.28	45.5%
5.29	5.00	6.91	38.2%
5.31	5.00	6.55	31.1%
5.33	5.00	6.20	24.0%
5.35	5.00	5.85	17.0%
5.36	5.00	5.68	13.6%
5.37	5.00	5.51	10.1%
5.38	5.00	5.34	6.7%
5.39	5.00	5.17	3.4%
5.40	5.00	5.00	0.0%
5.41	5.00	4.83	-3.3%
5.42	5.00	4.67	-6.6%
5.43	5.00	4.50	-9.9%
5.44	5.00	4.34	-13.2%
5.45	5.00	4.18	-16.4%
5.47	5.00	3.90	-22.0%
5.49	5.00	3.63	-27.4%
5.51	5.00	3.38	-32.4%
5.53	5.00	3.15	-37.1%
5.55	5.00	2.91	-41.7%
5.57	5.00	2.69	-46.2%
5.59	5.00	2.47	-50.7%
5.61	5.00	2.26	-54.8%
5.63	5.00	2.07	-58.5%
5.65	5.00	1.90	-62.0%

WATERLINE AT ZERO

AREA ERROR = 5.400

STREAM NAME: Disappointment Creek
 XS LOCATION: BLM-Private boundary near old gage
 XS NUMBER: 3

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	2.70	32.60	2.43	3.35	79.13	34.33	100.0%	2.31	482.13	6.09
	4.40	27.78	1.00	1.65	27.80	28.42	82.8%	0.98	95.67	3.44
	4.45	27.64	0.96	1.60	26.42	28.25	82.3%	0.94	88.22	3.34
	4.50	27.50	0.91	1.55	25.04	28.07	81.8%	0.89	81.01	3.24
	4.55	27.17	0.87	1.50	23.67	27.72	80.8%	0.85	74.39	3.14
	4.60	26.58	0.84	1.45	22.33	27.10	79.0%	0.82	68.50	3.07
	4.65	25.98	0.81	1.40	21.01	26.49	77.2%	0.79	62.87	2.99
	4.70	25.38	0.78	1.35	19.73	25.87	75.4%	0.76	57.50	2.91
	4.75	24.76	0.75	1.30	18.48	25.24	73.5%	0.73	52.40	2.84
	4.80	24.14	0.71	1.25	17.25	24.60	71.7%	0.70	47.55	2.76
	4.85	23.52	0.68	1.20	16.06	23.96	69.8%	0.67	42.95	2.67
	4.90	22.90	0.65	1.15	14.90	23.33	68.0%	0.64	38.59	2.59
	4.95	22.28	0.62	1.10	13.77	22.69	66.1%	0.61	34.47	2.50
	5.00	21.66	0.59	1.05	12.67	22.05	64.2%	0.57	30.58	2.41
	5.05	21.04	0.55	1.00	11.60	21.42	62.4%	0.54	26.93	2.32
	5.10	20.42	0.52	0.95	10.57	20.78	60.5%	0.51	23.51	2.22
	5.15	19.80	0.48	0.90	9.56	20.15	58.7%	0.47	20.32	2.12
	5.20	19.18	0.45	0.85	8.59	19.51	56.8%	0.44	17.35	2.02
	5.25	18.56	0.41	0.80	7.64	18.87	55.0%	0.41	14.61	1.91
	5.30	17.94	0.38	0.75	6.73	18.24	53.1%	0.37	12.09	1.80
	5.35	17.32	0.34	0.70	5.85	17.60	51.3%	0.33	9.80	1.68
WL	5.40	16.70	0.30	0.65	5.00	16.97	49.4%	0.29	7.73	1.55
	5.45	14.15	0.30	0.60	4.18	14.41	42.0%	0.29	6.39	1.53
	5.50	12.00	0.29	0.55	3.50	12.25	35.7%	0.29	5.30	1.51
	5.55	11.43	0.25	0.50	2.91	11.66	34.0%	0.25	4.04	1.39
	5.60	9.86	0.24	0.45	2.36	10.07	29.3%	0.23	3.13	1.33
	5.65	8.44	0.23	0.40	1.90	8.61	25.1%	0.22	2.42	1.27
	5.70	7.01	0.22	0.35	1.51	7.16	20.8%	0.21	1.88	1.24
	5.75	6.84	0.17	0.30	1.17	6.96	20.3%	0.17	1.24	1.06
	5.80	6.67	0.12	0.25	0.83	6.76	19.7%	0.12	0.71	0.86
	5.85	4.50	0.11	0.20	0.51	4.55	13.3%	0.11	0.42	0.81
	5.90	3.33	0.09	0.15	0.32	3.36	9.8%	0.09	0.23	0.72
	5.95	2.92	0.05	0.10	0.16	2.93	8.5%	0.05	0.08	0.50
	6.00	1.00	0.02	0.05	0.02	1.00	2.9%	0.02	0.01	0.30

STREAM NAME: Disappointment Creek
XS LOCATION: BLM-Private boundary near old gage
XS NUMBER: 3

SUMMARY SHEET

MEASURED FLOW (Qm)=	7.73 cfs
CALCULATED FLOW (Qc)=	7.73 cfs
(Qm-Qc)/Qm * 100 =	0.0 %
MEASURED WATERLINE (WLm)=	5.40 ft
CALCULATED WATERLINE (WLc)=	5.40 ft
(WLm-WLc)/WLm * 100 =	0.0 %
MAX MEASURED DEPTH (Dm)=	0.65 ft
MAX CALCULATED DEPTH (Dc)=	0.65 ft
(Dm-Dc)/Dm * 100	0.0 %
MEAN VELOCITY=	1.55 ft/sec
MANNING'S N=	0.031
SLOPE=	0.0054 ft/ft
.4 * Qm =	3.1 cfs
2.5 * Qm=	19.3 cfs

RECOMMENDED INSTREAM FLOW:
=====

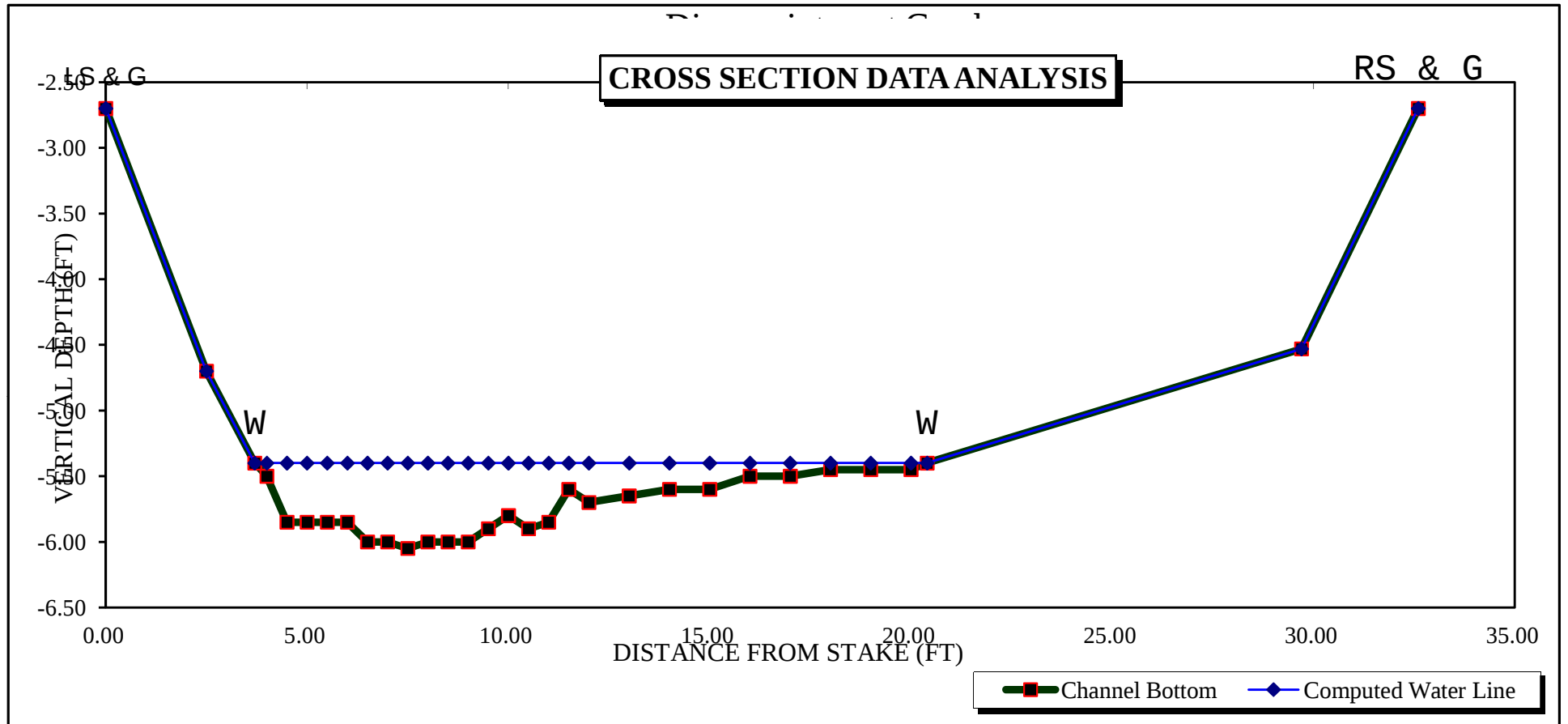
FLOW (CFS)	PERIOD
=====	=====

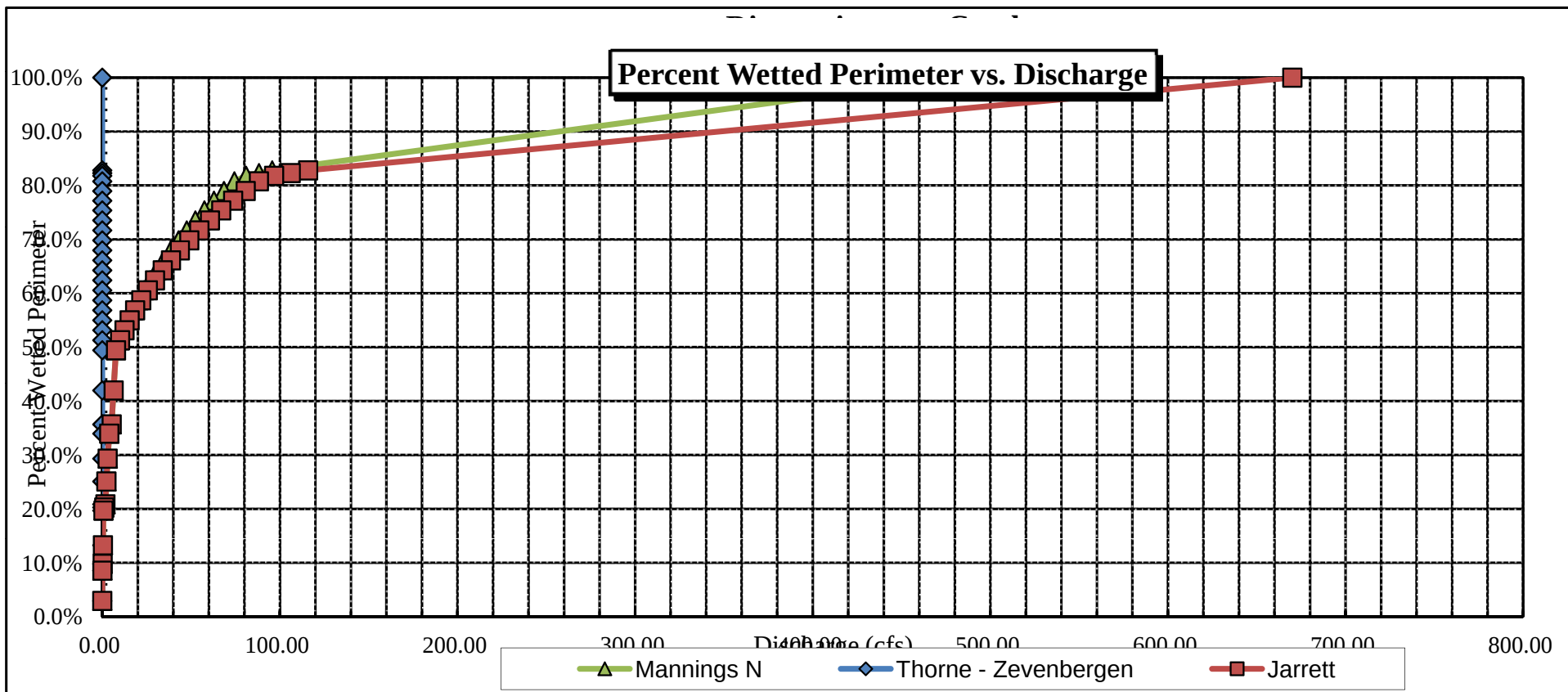
RATIONALE FOR RECOMMENDATION:
=====

[illegible]

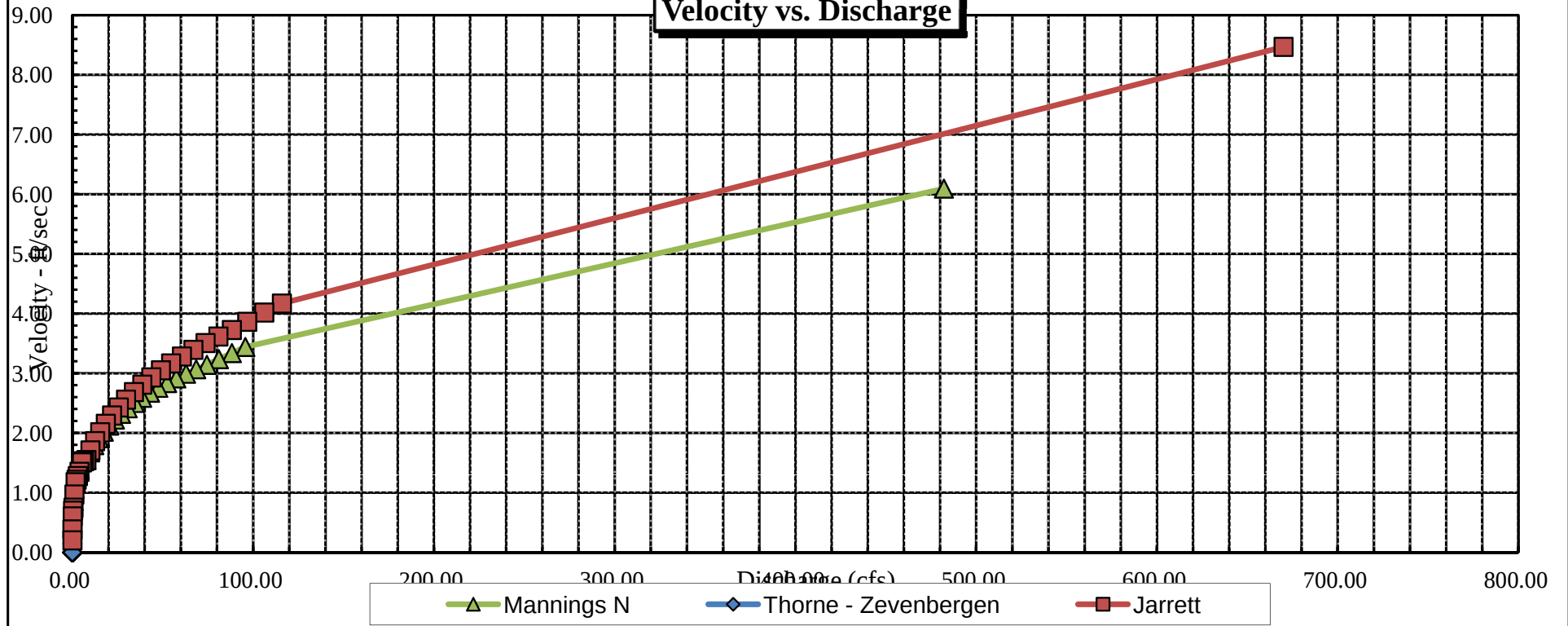
RECOMMENDATION BY: AGENCY..... DATE:.....

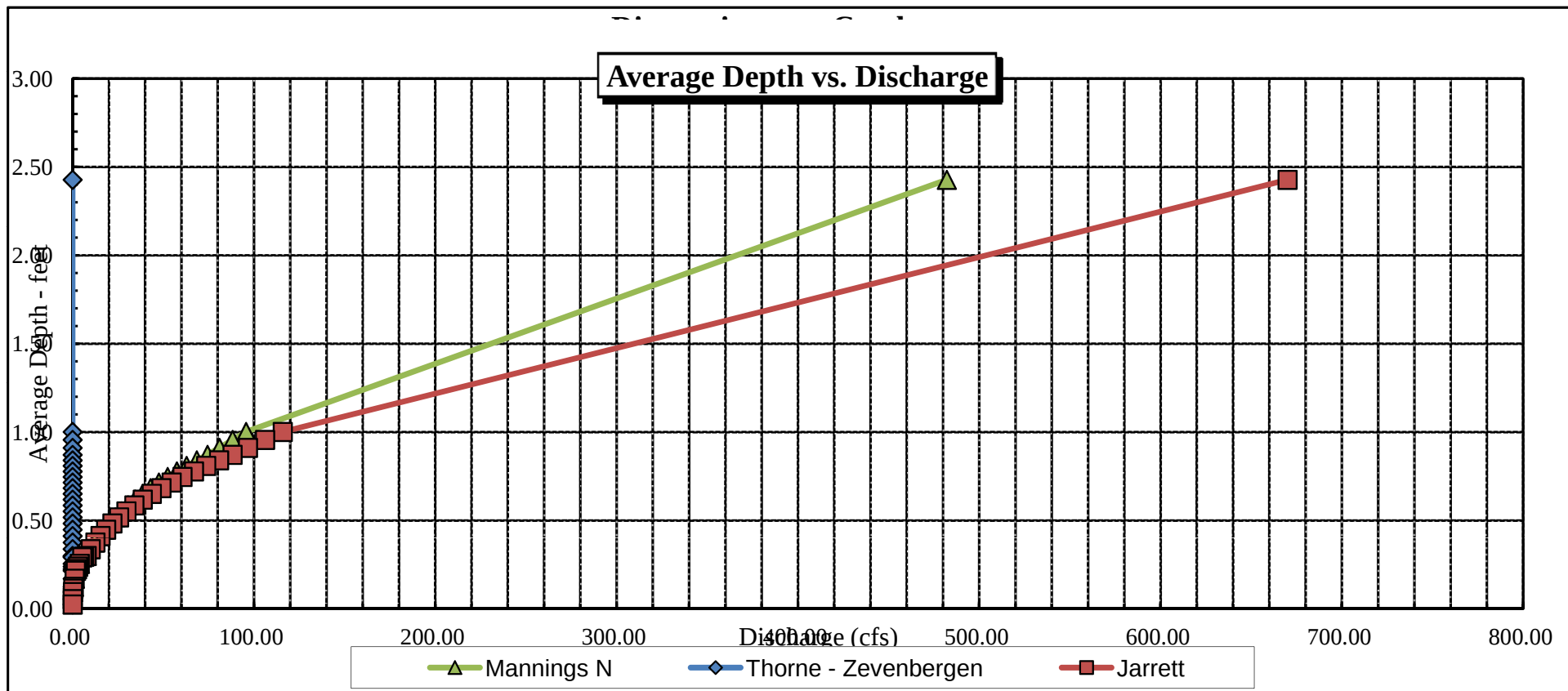
CWCB REVIEW BY: DATE:



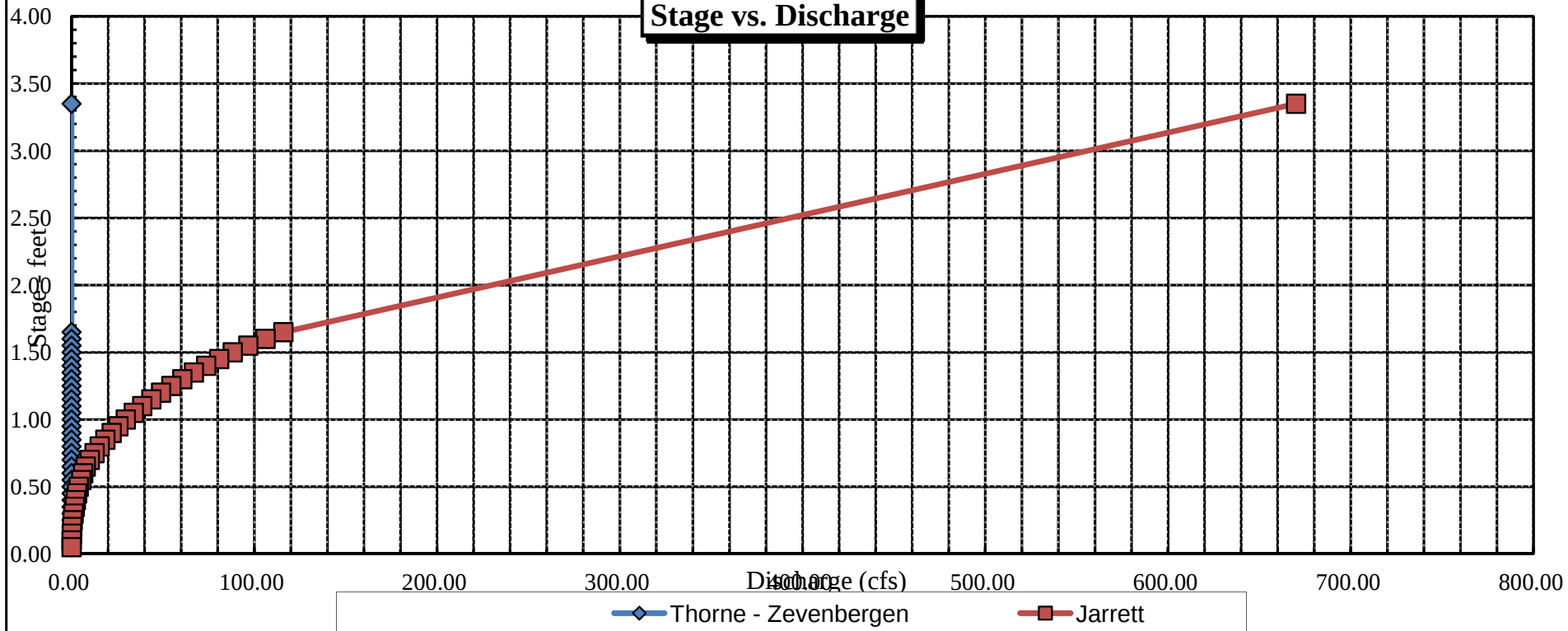


Velocity vs. Discharge





Stage vs. Discharge



Data Input & Proofing

STREAM NAME: Disappointment Creek
 XS LOCATION: 300' upst from county road bridge
 XS NUMBER: 2
 DATE: 6/29/2016
 OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SW
 SECTION: 2
 TWP: 43N
 RANGE: 18W
 PM: New Mexico

COUNTY: San Miguel
 WATERSHED: Dolores River
 DIVISION: 7
 DOW CODE: 39758
 USGS MAP:
 USFS MAP:

TAPE WT: 0.0106 Level and Rod Survey lbs / ft
 TENSION: 99999 lbs

SLOPE: 0.0045 ft / ft

CHECKED BY:.....DATE.....

ASSIGNED TO:DATE.....

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
Total Data Points = 28								
1	LS & G	0.00	7.57			0.00	0.00	0.00
		1.60	9.30			0.00	0.00	0.00
	W	2.30	10.10	0.00	0.00	0.00	0.00	0.00
		3.00	10.60	0.50	0.45	0.43	0.19	10.10
		4.00	10.65	0.55	1.69	0.41	0.70	10.10
		4.50	10.60	0.50	1.66	0.25	0.42	10.10
		5.00	10.60	0.50	2.44	0.38	0.92	10.10
		6.00	10.50	0.40	1.84	0.40	0.74	10.10
		7.00	10.50	0.40	2.20	0.40	0.88	10.10
		8.00	10.65	0.55	2.73	0.55	1.50	10.10
		9.00	10.70	0.60	2.28	0.45	1.03	10.10
		9.50	10.70	0.60	2.16	0.30	0.65	10.10
		10.00	10.60	0.50	2.72	0.38	1.02	10.10
		11.00	10.60	0.50	2.38	0.50	1.19	10.10
		12.00	10.60	0.50	2.28	0.50	1.14	10.10
		13.00	10.65	0.55	1.78	0.55	0.98	10.10
		14.00	10.65	0.55	1.59	0.55	0.87	10.10
		15.00	10.60	0.50	2.02	0.50	1.01	10.10
		16.00	10.50	0.40	1.87	0.40	0.75	10.10
		17.00	10.40	0.30	0.57	0.30	0.17	10.10
		18.00	10.30	0.20	1.49	0.20	0.30	10.10
		19.00	10.30	0.20	1.23	0.20	0.25	10.10
		20.00	10.35	0.25	0.95	0.25	0.24	10.10
		21.00	10.30	0.20	0.20	0.20	0.04	10.10
		22.00	10.20	0.10	0.00	0.09	0.00	10.10
	W	22.80	10.10	0.00	0.00	0.00	0.00	0.00
		24.80	9.25			0.00	0.00	0.00
1	RS & G	26.30	7.52			0.00	0.00	0.00

Totals	8.18	14.96
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COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Disappointment Creek
XS LOCATION: 300' upst from county road bridge
XS NUMBER: 2

DATE: 29-Jun-16
OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SW
SECTION: 2
TWP: 43N
RANGE: 18W
PM: New Mexico

COUNTY: San Miguel
WATERSHED: Dolores River
DIVISION: 7
DOW CODE: 39758

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: 0.0045

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Disappointment Creek
 XS LOCATION: 300' upst from county road bridge
 XS NUMBER: 2

DATA POINTS= 28

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
1 LS & G	0.00	7.57		
	1.60	9.30		
W	2.30	10.10	0.00	0.00
	3.00	10.60	0.50	0.45
	4.00	10.65	0.55	1.69
	4.50	10.60	0.50	1.66
	5.00	10.60	0.50	2.44
	6.00	10.50	0.40	1.84
	7.00	10.50	0.40	2.20
	8.00	10.65	0.55	2.73
	9.00	10.70	0.60	2.28
	9.50	10.70	0.60	2.16
	10.00	10.60	0.50	2.72
	11.00	10.60	0.50	2.38
	12.00	10.60	0.50	2.28
	13.00	10.65	0.55	1.78
	14.00	10.65	0.55	1.59
	15.00	10.60	0.50	2.02
	16.00	10.50	0.40	1.87
	17.00	10.40	0.30	0.57
	18.00	10.30	0.20	1.49
	19.00	10.30	0.20	1.23
	20.00	10.35	0.25	0.95
	21.00	10.30	0.20	0.20
	22.00	10.20	0.10	0.00
W	22.80	10.10	0.00	0.00
	24.80	9.25		
1 RS & G	26.30	7.52		

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%
0.86	0.50	0.43	0.19	1.3%
1.00	0.55	0.41	0.70	4.7%
0.50	0.50	0.25	0.42	2.8%
0.50	0.50	0.38	0.92	6.1%
1.00	0.40	0.40	0.74	4.9%
1.00	0.40	0.40	0.88	5.9%
1.01	0.55	0.55	1.50	10.0%
1.00	0.60	0.45	1.03	6.9%
0.50	0.60	0.30	0.65	4.3%
0.51	0.50	0.38	1.02	6.8%
1.00	0.50	0.50	1.19	8.0%
1.00	0.50	0.50	1.14	7.6%
1.00	0.55	0.55	0.98	6.5%
1.00	0.55	0.55	0.87	5.8%
1.00	0.50	0.50	1.01	6.7%
1.00	0.40	0.40	0.75	5.0%
1.00	0.30	0.30	0.17	1.1%
1.00	0.20	0.20	0.30	2.0%
1.00	0.20	0.20	0.25	1.6%
1.00	0.25	0.25	0.24	1.6%
1.00	0.20	0.20	0.04	0.3%
1.00	0.10	0.09	0.00	0.0%
0.81		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

TOTALS -----

20.72	0.6	8.18	14.96	100.0%
(Max.)				
Manning's n =		0.0293		
Hydraulic Radius=		0.39461986		

STREAM NAME: Disappointment Creek
 XS LOCATION: 300' upst from county road bridge
 XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	8.18	8.18	0.0%
9.85	8.18	13.40	63.9%
9.87	8.18	12.98	58.7%
9.89	8.18	12.55	53.5%
9.91	8.18	12.13	48.3%
9.93	8.18	11.71	43.2%
9.95	8.18	11.29	38.0%
9.97	8.18	10.87	32.9%
9.99	8.18	10.45	27.8%
10.01	8.18	10.04	22.7%
10.03	8.18	9.62	17.6%
10.05	8.18	9.21	12.6%
10.06	8.18	9.00	10.1%
10.07	8.18	8.79	7.5%
10.08	8.18	8.59	5.0%
10.09	8.18	8.38	2.5%
10.10	8.18	8.18	0.0%
10.11	8.18	7.97	-2.5%
10.12	8.18	7.77	-5.0%
10.13	8.18	7.57	-7.5%
10.14	8.18	7.37	-9.9%
10.15	8.18	7.16	-12.4%
10.17	8.18	6.77	-17.3%
10.19	8.18	6.37	-22.1%
10.21	8.18	5.98	-26.9%
10.23	8.18	5.59	-31.6%
10.25	8.18	5.21	-36.3%
10.27	8.18	4.83	-40.9%
10.29	8.18	4.46	-45.5%
10.31	8.18	4.10	-49.8%
10.33	8.18	3.78	-53.8%
10.35	8.18	3.47	-57.6%

WATERLINE AT ZERO

AREA ERROR = 10.100

STREAM NAME: Disappointment Creek
 XS LOCATION: 300' upst from county road bridge
 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	7.57	26.26	2.60	3.13	68.35	28.54	100.0%	2.40	416.18	6.09
	9.10	23.52	1.29	1.60	30.28	24.43	85.6%	1.24	118.81	3.92
	9.15	23.43	1.24	1.55	29.10	24.30	85.1%	1.20	111.65	3.84
	9.20	23.34	1.20	1.50	27.93	24.16	84.7%	1.16	104.66	3.75
	9.25	23.25	1.15	1.45	26.77	24.03	84.2%	1.11	97.85	3.66
	9.30	23.08	1.11	1.40	25.61	23.83	83.5%	1.07	91.39	3.57
	9.35	22.92	1.07	1.35	24.46	23.64	82.8%	1.03	85.12	3.48
	9.40	22.76	1.02	1.30	23.32	23.44	82.1%	0.99	79.03	3.39
	9.45	22.60	0.98	1.25	22.18	23.25	81.5%	0.95	73.14	3.30
	9.50	22.44	0.94	1.20	21.06	23.05	80.8%	0.91	67.43	3.20
	9.55	22.28	0.90	1.15	19.94	22.86	80.1%	0.87	61.92	3.11
	9.60	22.11	0.85	1.10	18.83	22.67	79.4%	0.83	56.61	3.01
	9.65	21.95	0.81	1.05	17.73	22.47	78.7%	0.79	51.49	2.90
	9.70	21.79	0.76	1.00	16.64	22.28	78.1%	0.75	46.57	2.80
	9.75	21.63	0.72	0.95	15.55	22.08	77.4%	0.70	41.86	2.69
	9.80	21.47	0.67	0.90	14.47	21.89	76.7%	0.66	37.36	2.58
	9.85	21.31	0.63	0.85	13.40	21.69	76.0%	0.62	33.07	2.47
	9.90	21.15	0.58	0.80	12.34	21.50	75.3%	0.57	29.00	2.35
	9.95	20.98	0.54	0.75	11.29	21.31	74.7%	0.53	25.14	2.23
	10.00	20.82	0.49	0.70	10.24	21.11	74.0%	0.49	21.51	2.10
	10.05	20.66	0.45	0.65	9.21	20.92	73.3%	0.44	18.12	1.97
WL	10.10	20.50	0.40	0.60	8.18	20.72	72.6%	0.39	14.96	1.83
	10.15	20.03	0.36	0.55	7.16	20.23	70.9%	0.35	12.20	1.70
	10.20	19.56	0.32	0.50	6.17	19.74	69.2%	0.31	9.68	1.57
	10.25	18.99	0.27	0.45	5.21	19.16	67.1%	0.27	7.44	1.43
	10.30	17.42	0.25	0.40	4.28	17.57	61.6%	0.24	5.67	1.33
	10.35	14.85	0.23	0.35	3.47	14.98	52.5%	0.23	4.45	1.28
	10.40	14.28	0.19	0.30	2.74	14.39	50.4%	0.19	3.09	1.13
	10.45	13.71	0.15	0.25	2.04	13.80	48.4%	0.15	1.94	0.95
	10.50	12.14	0.11	0.20	1.37	12.21	42.8%	0.11	1.08	0.79
	10.55	10.74	0.07	0.15	0.80	10.78	37.8%	0.07	0.48	0.60
	10.60	6.83	0.04	0.10	0.30	6.85	24.0%	0.04	0.12	0.42
	10.65	1.75	0.03	0.05	0.06	1.76	6.2%	0.03	0.02	0.34
	10.70	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!

STREAM NAME: Disappointment Creek
XS LOCATION: 300' upst from county road bridge
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	14.96 cfs
CALCULATED FLOW (Qc)=	14.96 cfs
(Qm-Qc)/Qm * 100 =	0.0 %
MEASURED WATERLINE (WLm)=	10.10 ft
CALCULATED WATERLINE (WLc)=	10.10 ft
(WLm-WLc)/WLm * 100 =	0.0 %
MAX MEASURED DEPTH (Dm)=	0.60 ft
MAX CALCULATED DEPTH (Dc)=	0.60 ft
(Dm-Dc)/Dm * 100	0.0 %
MEAN VELOCITY=	1.83 ft/sec
MANNING'S N=	0.029
SLOPE=	0.0045 ft/ft
.4 * Qm =	6.0 cfs
2.5 * Qm=	37.4 cfs

RECOMMENDED INSTREAM FLOW:

FLOW (CFS)

PERIOD

RATIONALE FOR RECOMMENDATION:

=====

[illegible]

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

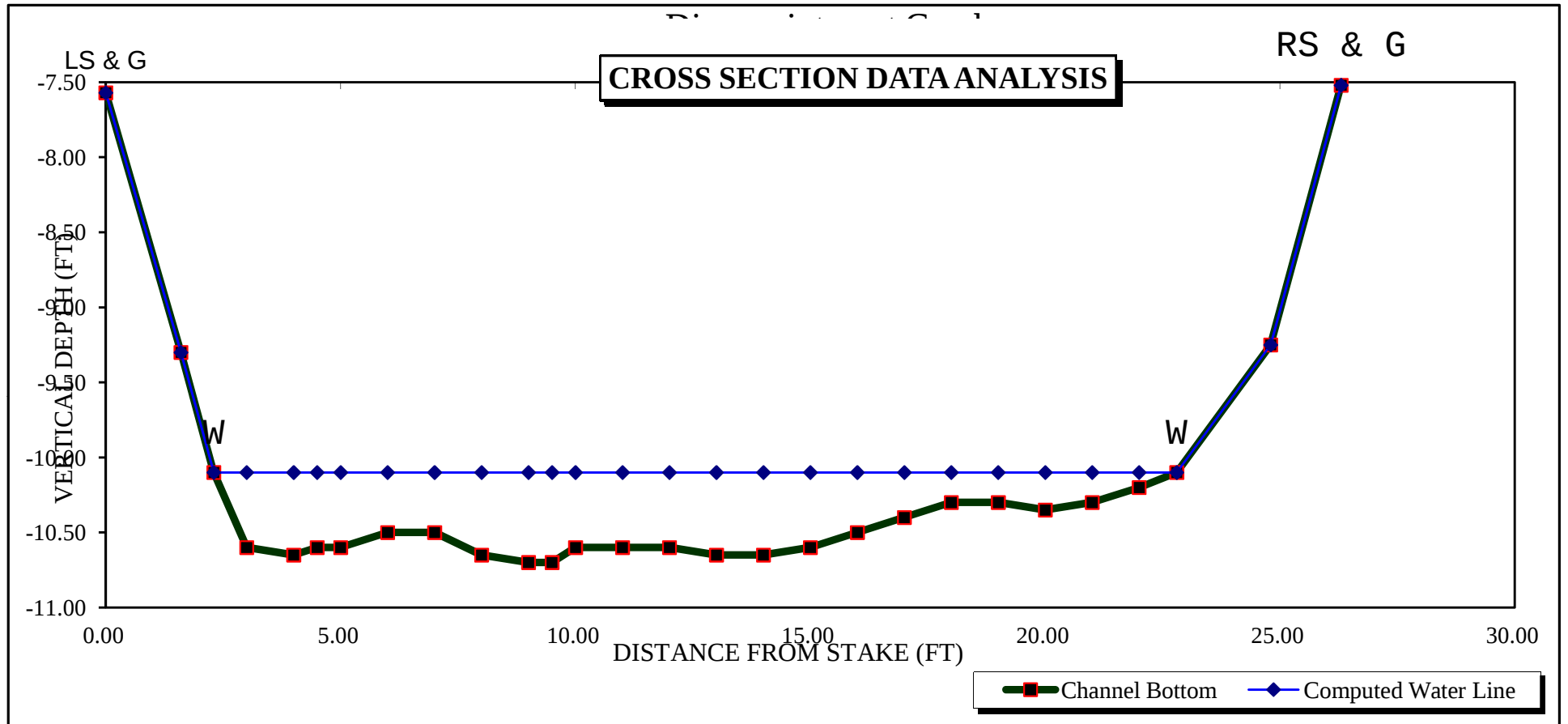
CWCB REVIEW BY: DATE:.....

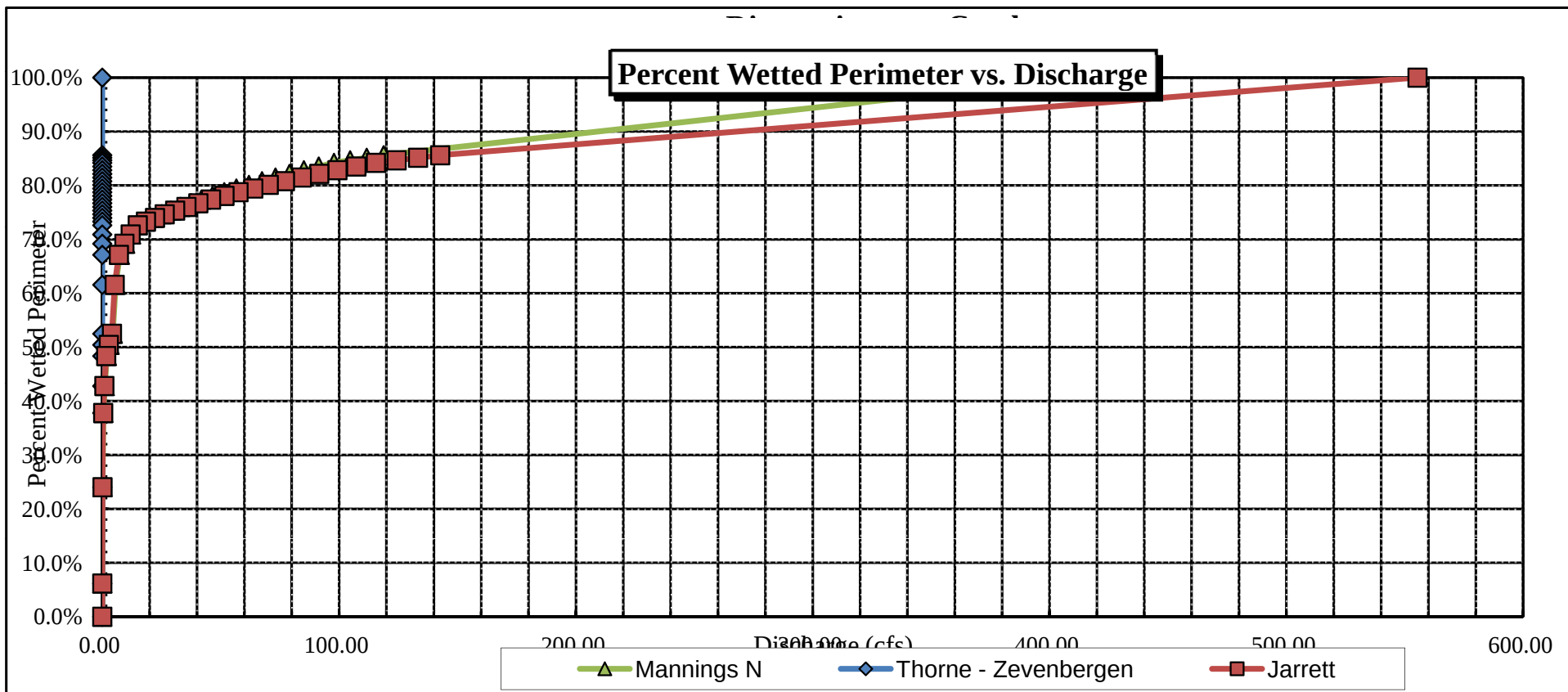
STREAM NAME: Disappointment Creek
 XS LOCATION: 300' upst from county road bridge
 XS NUMBER: 2 Jarrett Variable Manning's n Correction Applied

GL = lowest Grassline elevation corrected for sag

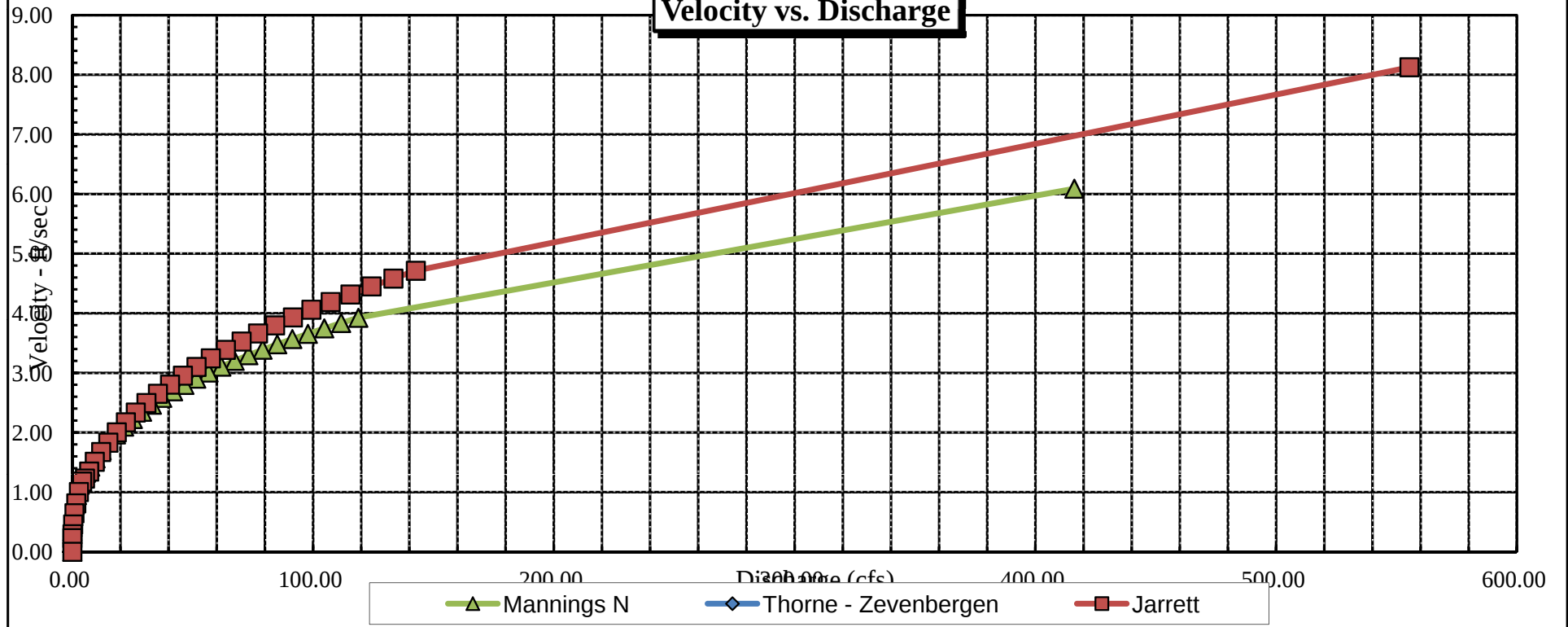
STAGING TABLE *WL* = Waterline corrected for variations in field measured water surface elevations and sag

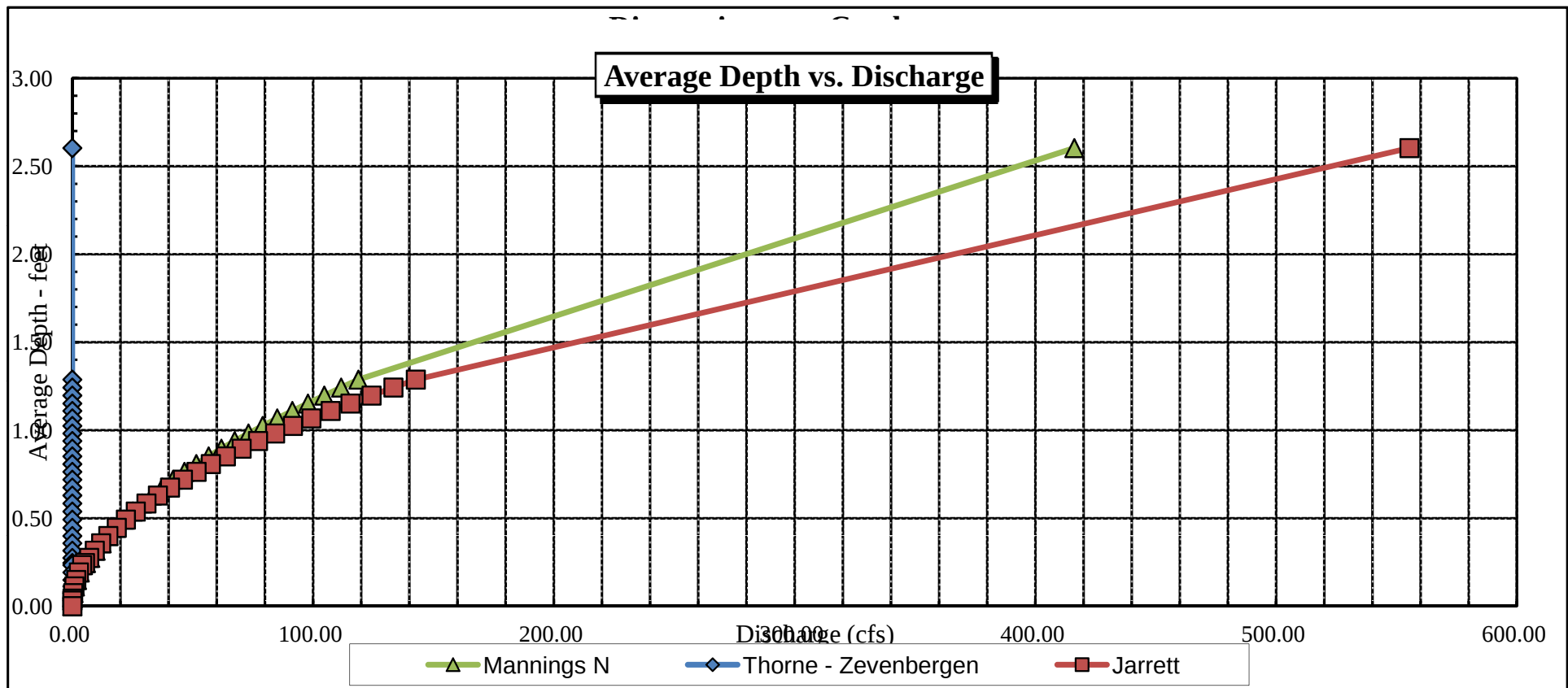
	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	7.57	26.26	2.60	3.13	68.35	28.54	100.0%	2.40	555.38	8.13
	9.10	23.52	1.29	1.60	30.28	24.43	85.6%	1.24	142.69	4.71
	9.15	23.43	1.24	1.55	29.10	24.30	85.1%	1.20	133.35	4.58
	9.20	23.34	1.20	1.50	27.93	24.16	84.7%	1.16	124.30	4.45
	9.25	23.25	1.15	1.45	26.77	24.03	84.2%	1.11	115.53	4.32
	9.30	23.08	1.11	1.40	25.61	23.83	83.5%	1.07	107.28	4.19
	9.35	22.92	1.07	1.35	24.46	23.64	82.8%	1.03	99.32	4.06
	9.40	22.76	1.02	1.30	23.32	23.44	82.1%	0.99	91.63	3.93
	9.45	22.60	0.98	1.25	22.18	23.25	81.5%	0.95	84.24	3.80
	9.50	22.44	0.94	1.20	21.06	23.05	80.8%	0.91	77.12	3.66
	9.55	22.28	0.90	1.15	19.94	22.86	80.1%	0.87	70.30	3.53
	9.60	22.11	0.85	1.10	18.83	22.67	79.4%	0.83	63.77	3.39
	9.65	21.95	0.81	1.05	17.73	22.47	78.7%	0.79	57.53	3.24
	9.70	21.79	0.76	1.00	16.64	22.28	78.1%	0.75	51.58	3.10
	9.75	21.63	0.72	0.95	15.55	22.08	77.4%	0.70	45.93	2.95
	9.80	21.47	0.67	0.90	14.47	21.89	76.7%	0.66	40.58	2.80
	9.85	21.31	0.63	0.85	13.40	21.69	76.0%	0.62	35.53	2.65
	9.90	21.15	0.58	0.80	12.34	21.50	75.3%	0.57	30.79	2.49
	9.95	20.98	0.54	0.75	11.29	21.31	74.7%	0.53	26.36	2.33
	10.00	20.82	0.49	0.70	10.24	21.11	74.0%	0.49	22.24	2.17
	10.05	20.66	0.45	0.65	9.21	20.92	73.3%	0.44	18.44	2.00
WL	10.10	20.50	0.40	0.60	8.18	20.72	72.6%	0.39	14.96	1.83
	10.15	20.03	0.36	0.55	7.16	20.23	70.9%	0.35	11.99	1.67
	10.20	19.56	0.32	0.50	6.17	19.74	69.2%	0.31	9.32	1.51
	10.25	18.99	0.27	0.45	5.21	19.16	67.1%	0.27	7.01	1.35
	10.30	17.42	0.25	0.40	4.28	17.57	61.6%	0.24	5.25	1.23
	10.35	14.85	0.23	0.35	3.47	14.98	52.5%	0.23	4.09	1.18
	10.40	14.28	0.19	0.30	2.74	14.39	50.4%	0.19	2.75	1.00
	10.45	13.71	0.15	0.25	2.04	13.80	48.4%	0.15	1.66	0.81
	10.50	12.14	0.11	0.20	1.37	12.21	42.8%	0.11	0.89	0.65
	10.55	10.74	0.07	0.15	0.80	10.78	37.8%	0.07	0.37	0.46
	10.60	6.83	0.04	0.10	0.30	6.85	24.0%	0.04	0.09	0.29
	10.65	1.75	0.03	0.05	0.06	1.76	6.2%	0.03	0.01	0.23
	10.70	0.00	#DIV/0!	0.00	0.00	0.00	0.0%	#DIV/0!	#DIV/0!	#DIV/0!



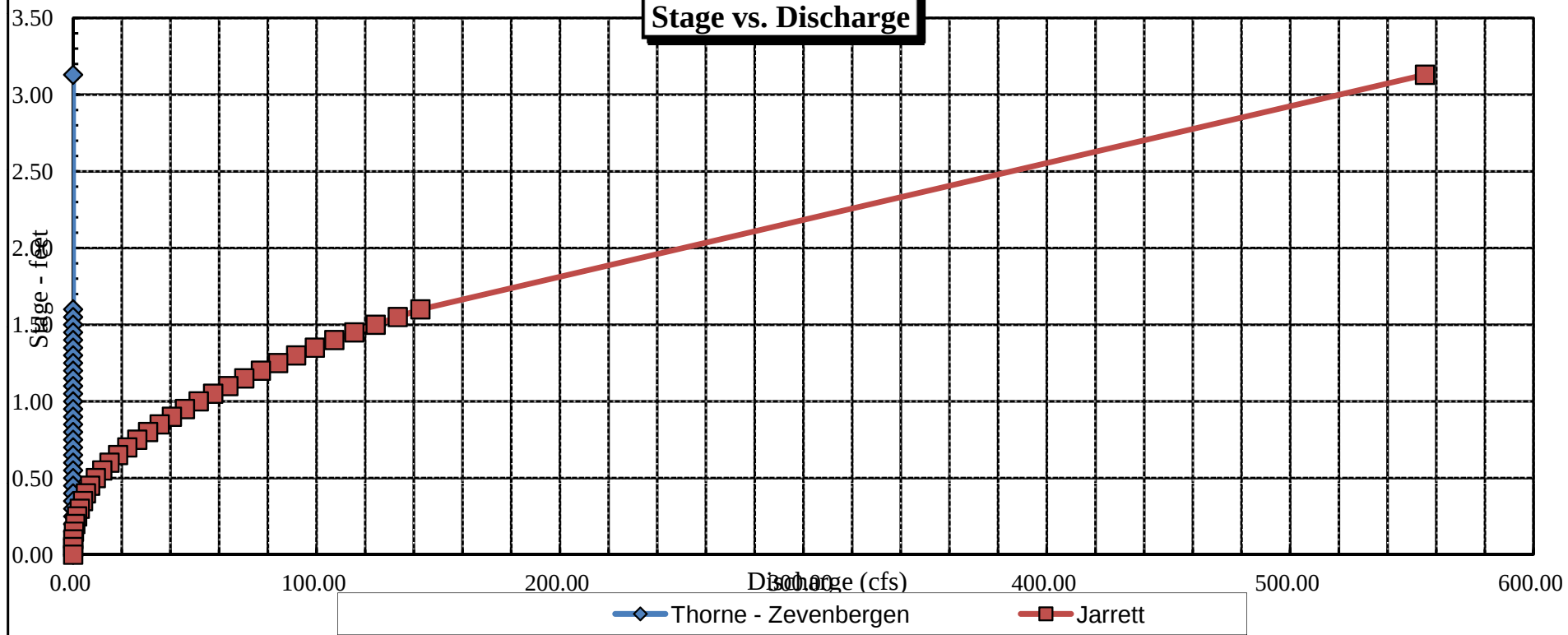


Velocity vs. Discharge





Stage vs. Discharge



Data Input & Proofing

STREAM NAME: Disappointment Creek
 XS LOCATION: 1500 ft. upst from county road bridge
 XS NUMBER: 1
 DATE: 6/29/2016
 OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SW
 SECTION: 2
 TWP: 43N
 RANGE: 18W
 PM: New Mexico

COUNTY: San Miguel
 WATERSHED: Dolores River
 DIVISION: 7
 DOW CODE: 39758
 USGS MAP:
 USFS MAP:

TAPE WT: 0.0106 lbs / ft
 TENSION: 99999 lbs

SLOPE: 0.019 ft / ft

CHECKED BY:.....DATE.....

ASSIGNED TO:DATE.....

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
Total Data Points = 28								
1	LS	0.00	5.52			0.00	0.00	0.00
	G	1.70	5.84			0.00	0.00	0.00
		3.00	7.05			0.00	0.00	0.00
	W	4.10	7.85	0.00	0.00	0.00	0.00	0.00
		5.00	8.15	0.30	0.79	0.29	0.23	7.85
		6.00	8.35	0.50	2.33	0.50	1.17	7.85
		7.00	8.40	0.55	2.36	0.55	1.30	7.85
		8.00	8.50	0.65	2.53	0.65	1.64	7.85
		9.00	8.50	0.65	2.40	0.65	1.56	7.85
		10.00	8.50	0.65	2.30	0.65	1.50	7.85
		11.00	8.45	0.60	1.29	0.60	0.77	7.85
		12.00	8.35	0.50	1.74	0.50	0.87	7.85
		13.00	8.25	0.40	2.32	0.40	0.93	7.85
		14.00	8.25	0.40	2.23	0.40	0.89	7.85
		15.00	8.25	0.40	1.83	0.40	0.73	7.85
		16.00	8.00	0.15	0.56	0.15	0.08	7.85
		17.00	8.15	0.30	1.74	0.30	0.52	7.85
		18.00	8.05	0.20	1.20	0.20	0.24	7.85
		19.00	8.05	0.20	1.21	0.20	0.24	7.85
		20.00	8.20	0.35	1.24	0.35	0.43	7.85
		21.00	8.20	0.35	1.48	0.35	0.52	7.85
		22.00	8.15	0.30	1.82	0.30	0.55	7.85
		23.00	8.15	0.30	0.45	0.30	0.14	7.85
		24.00	8.15	0.30	0.97	0.30	0.29	7.85
		25.00	8.05	0.20	0.44	0.20	0.09	7.85
	W	26.00	7.85	0.00	0.00	0.00	0.00	0.00
		30.70	6.88			0.00	0.00	0.00
	RS & G	39.20	5.52			0.00	0.00	0.00

Totals	8.24	14.68
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COLORADO WATER CONSERVATION BOARD
INSTREAM FLOW / NATURAL LAKE LEVEL PROGRAM
STREAM CROSS-SECTION AND FLOW ANALYSIS

LOCATION INFORMATION

STREAM NAME: Disappointment Creek
XS LOCATION: 1500 ft. upst from county road bridge
XS NUMBER: 1

DATE: 29-Jun-16
OBSERVERS: R. Smith, J. Sondergard

1/4 SEC: SW
SECTION: 2
TWP: 43N
RANGE: 18W
PM: New Mexico

COUNTY: San Miguel
WATERSHED: Dolores River
DIVISION: 7
DOW CODE: 39758

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: 0.019

INPUT DATA CHECKED BY:DATE.....

ASSIGNED TO:DATE.....

STREAM NAME: Disappointment Creek
 XS LOCATION: 1500 ft. upst from county road bridge
 XS NUMBER: 1

DATA POINTS= 28

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
LS	0.00	5.52		
1 G	1.70	5.84		
	3.00	7.05		
W	4.10	7.85	0.00	0.00
	5.00	8.15	0.30	0.79
	6.00	8.35	0.50	2.33
	7.00	8.40	0.55	2.36
	8.00	8.50	0.65	2.53
	9.00	8.50	0.65	2.40
	10.00	8.50	0.65	2.30
	11.00	8.45	0.60	1.29
	12.00	8.35	0.50	1.74
	13.00	8.25	0.40	2.32
	14.00	8.25	0.40	2.23
	15.00	8.25	0.40	1.83
	16.00	8.00	0.15	0.56
	17.00	8.15	0.30	1.74
	18.00	8.05	0.20	1.20
	19.00	8.05	0.20	1.21
	20.00	8.20	0.35	1.24
	21.00	8.20	0.35	1.48
	22.00	8.15	0.30	1.82
	23.00	8.15	0.30	0.45
	24.00	8.15	0.30	0.97
W	25.00	8.05	0.20	0.44
	26.00	7.85	0.00	0.00
	30.70	6.88		
1 RS & G	39.20	5.52		

TOTALS -----

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%
0.95	0.30	0.29	0.23	1.5%
1.02	0.50	0.50	1.17	7.9%
1.00	0.55	0.55	1.30	8.8%
1.00	0.65	0.65	1.64	11.2%
1.00	0.65	0.65	1.56	10.6%
1.00	0.65	0.65	1.50	10.2%
1.00	0.60	0.60	0.77	5.3%
1.00	0.50	0.50	0.87	5.9%
1.00	0.40	0.40	0.93	6.3%
1.00	0.40	0.40	0.89	6.1%
1.00	0.40	0.40	0.73	5.0%
1.03	0.15	0.15	0.08	0.6%
1.01	0.30	0.30	0.52	3.6%
1.00	0.20	0.20	0.24	1.6%
1.00	0.20	0.20	0.24	1.6%
1.01	0.35	0.35	0.43	3.0%
1.00	0.35	0.35	0.52	3.5%
1.00	0.30	0.30	0.55	3.7%
1.00	0.30	0.30	0.14	0.9%
1.00	0.30	0.30	0.29	2.0%
1.00	0.20	0.20	0.09	0.6%
1.02		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%

22.07 0.65 8.24 14.68 100.0%
 (Max.)

Manning's n = 0.0595
 Hydraulic Radius= 0.37312879

STREAM NAME: Disappointment Creek
 XS LOCATION: 1500 ft. upst from county road bridge
 XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	8.24	8.24	0.0%
7.60	8.24	13.90	68.8%
7.62	8.24	13.44	63.2%
7.64	8.24	12.97	57.5%
7.66	8.24	12.51	51.9%
7.68	8.24	12.05	46.3%
7.70	8.24	11.59	40.7%
7.72	8.24	11.13	35.2%
7.74	8.24	10.68	29.7%
7.76	8.24	10.23	24.2%
7.78	8.24	9.78	18.8%
7.80	8.24	9.34	13.4%
7.81	8.24	9.12	10.7%
7.82	8.24	8.89	8.0%
7.83	8.24	8.67	5.3%
7.84	8.24	8.45	2.7%
7.85	8.24	8.24	0.0%
7.86	8.24	8.02	-2.7%
7.87	8.24	7.80	-5.3%
7.88	8.24	7.58	-7.9%
7.89	8.24	7.37	-10.6%
7.90	8.24	7.15	-13.2%
7.92	8.24	6.72	-18.4%
7.94	8.24	6.30	-23.5%
7.96	8.24	5.87	-28.7%
7.98	8.24	5.46	-33.7%
8.00	8.24	5.04	-38.8%
8.02	8.24	4.63	-43.8%
8.04	8.24	4.23	-48.7%
8.06	8.24	3.84	-53.3%
8.08	8.24	3.48	-57.7%
8.10	8.24	3.14	-61.9%

WATERLINE AT ZERO

AREA ERROR = 7.850

STREAM NAME: Disappointment Creek
 XS LOCATION: 1500 ft. upst from county road bridge
 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	5.84	35.50	1.84	2.66	65.36	36.59	100.0%	1.79	331.06	5.07
	6.85	28.10	1.18	1.65	33.24	28.71	78.5%	1.16	126.08	3.79
	6.90	27.76	1.15	1.60	31.84	28.35	77.5%	1.12	118.38	3.72
	6.95	27.47	1.11	1.55	30.46	28.03	76.6%	1.09	110.79	3.64
	7.00	27.17	1.07	1.50	29.10	27.71	75.7%	1.05	103.42	3.55
	7.05	26.88	1.03	1.45	27.75	27.39	74.9%	1.01	96.28	3.47
	7.10	26.57	0.99	1.40	26.41	27.06	73.9%	0.98	89.41	3.39
	7.15	26.25	0.96	1.35	25.09	26.72	73.0%	0.94	82.76	3.30
	7.20	25.94	0.92	1.30	23.78	26.39	72.1%	0.90	76.35	3.21
	7.25	25.63	0.88	1.25	22.49	26.06	71.2%	0.86	70.16	3.12
	7.30	25.32	0.84	1.20	21.22	25.73	70.3%	0.82	64.21	3.03
	7.35	25.01	0.80	1.15	19.96	25.39	69.4%	0.79	58.50	2.93
	7.40	24.70	0.76	1.10	18.72	25.06	68.5%	0.75	53.02	2.83
	7.45	24.39	0.72	1.05	17.49	24.73	67.6%	0.71	47.78	2.73
	7.50	24.08	0.68	1.00	16.28	24.40	66.7%	0.67	42.77	2.63
	7.55	23.77	0.63	0.95	15.08	24.06	65.8%	0.63	38.01	2.52
	7.60	23.46	0.59	0.90	13.90	23.73	64.9%	0.59	33.49	2.41
	7.65	23.14	0.55	0.85	12.74	23.40	64.0%	0.54	29.22	2.29
	7.70	22.83	0.51	0.80	11.59	23.07	63.0%	0.50	25.20	2.17
	7.75	22.52	0.46	0.75	10.46	22.73	62.1%	0.46	21.43	2.05
	7.80	22.21	0.42	0.70	9.34	22.40	61.2%	0.42	17.93	1.92
WL	7.85	21.90	0.38	0.65	8.23	22.07	60.3%	0.37	14.68	1.78
	7.90	21.50	0.33	0.60	7.15	21.66	59.2%	0.33	11.75	1.64
	7.95	21.10	0.29	0.55	6.09	21.24	58.1%	0.29	9.10	1.49
	8.00	20.70	0.24	0.50	5.04	20.83	56.9%	0.24	6.73	1.34
	8.05	18.77	0.21	0.45	4.03	18.87	51.6%	0.21	4.95	1.23
	8.10	16.75	0.19	0.40	3.14	16.83	46.0%	0.19	3.53	1.12
	8.15	12.73	0.18	0.35	2.35	12.79	35.0%	0.18	2.62	1.11
	8.20	9.95	0.18	0.30	1.76	9.99	27.3%	0.18	1.91	1.08
	8.25	7.50	0.17	0.25	1.27	7.53	20.6%	0.17	1.34	1.05
	8.30	6.75	0.14	0.20	0.92	6.77	18.5%	0.14	0.83	0.91
	8.35	6.00	0.10	0.15	0.60	6.01	16.4%	0.10	0.44	0.74
	8.40	4.50	0.07	0.10	0.34	4.51	12.3%	0.07	0.21	0.61
	8.45	3.50	0.04	0.05	0.14	3.50	9.6%	0.04	0.05	0.40

STREAM NAME: Disappointment Creek
XS LOCATION: 1500 ft. upst from county road bridge
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)= 14.68 cfs
CALCULATED FLOW (Qc)= 14.68 cfs
(Qm-Qc)/Qm * 100 = 0.0 %

MEASURED WATERLINE (WLm)= 7.85 ft
CALCULATED WATERLINE (WLc)= 7.85 ft
(WLm-WLc)/WLm * 100 = 0.0 %

MAX MEASURED DEPTH (Dm)= 0.65 ft
MAX CALCULATED DEPTH (Dc)= 0.65 ft
(Dm-Dc)/Dm * 100 = 0.0 %

MEAN VELOCITY= 1.78 ft/sec
MANNING'S N= 0.060
SLOPE= 0.019 ft/ft

.4 * Qm = 5.9 cfs
2.5 * Qm= 36.7 cfs

RECOMMENDED INSTREAM FLOW:
=====

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

RATIONALE FOR RECOMMENDATION:
=====

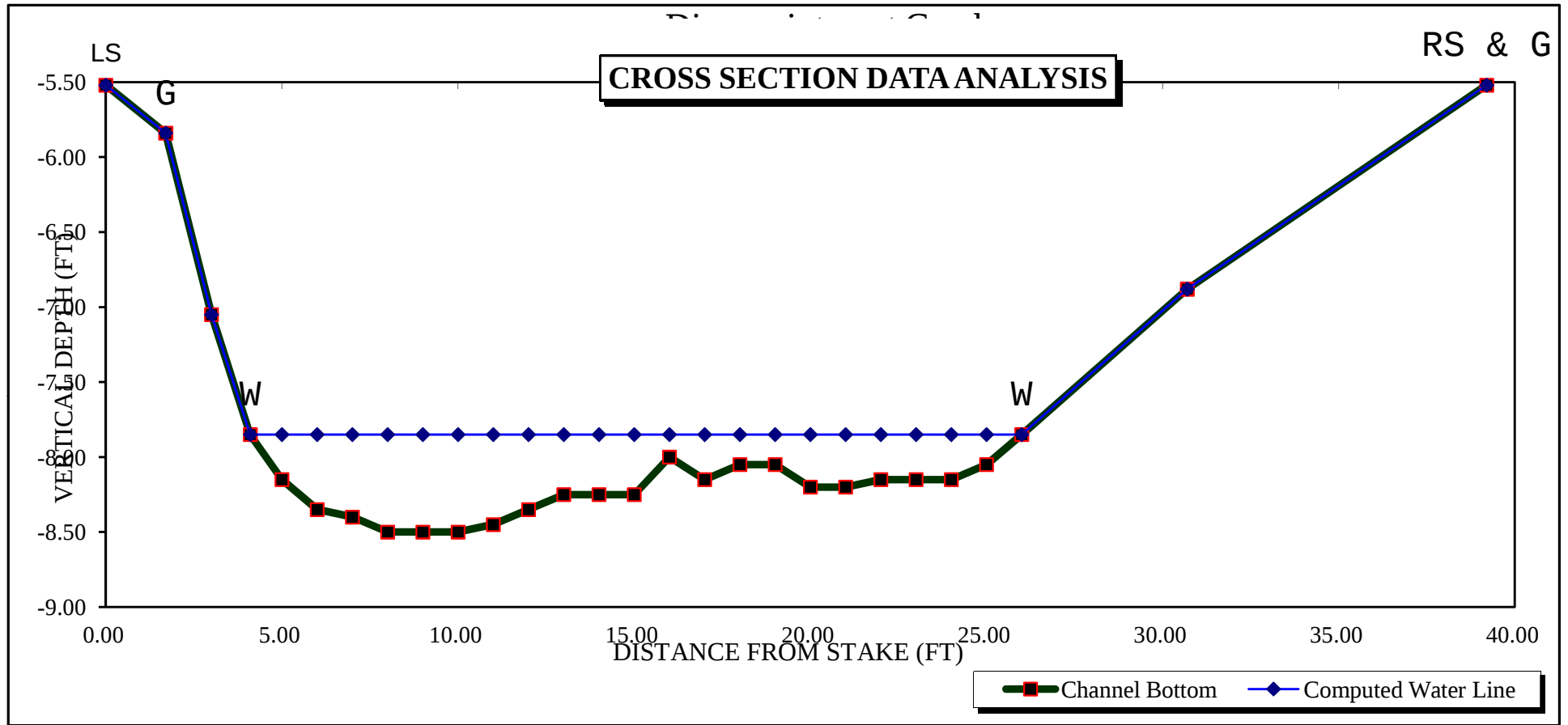
RECOMMENDATION BY: AGENCY..... DATE:.....
CWCB REVIEW BY: DATE:.....

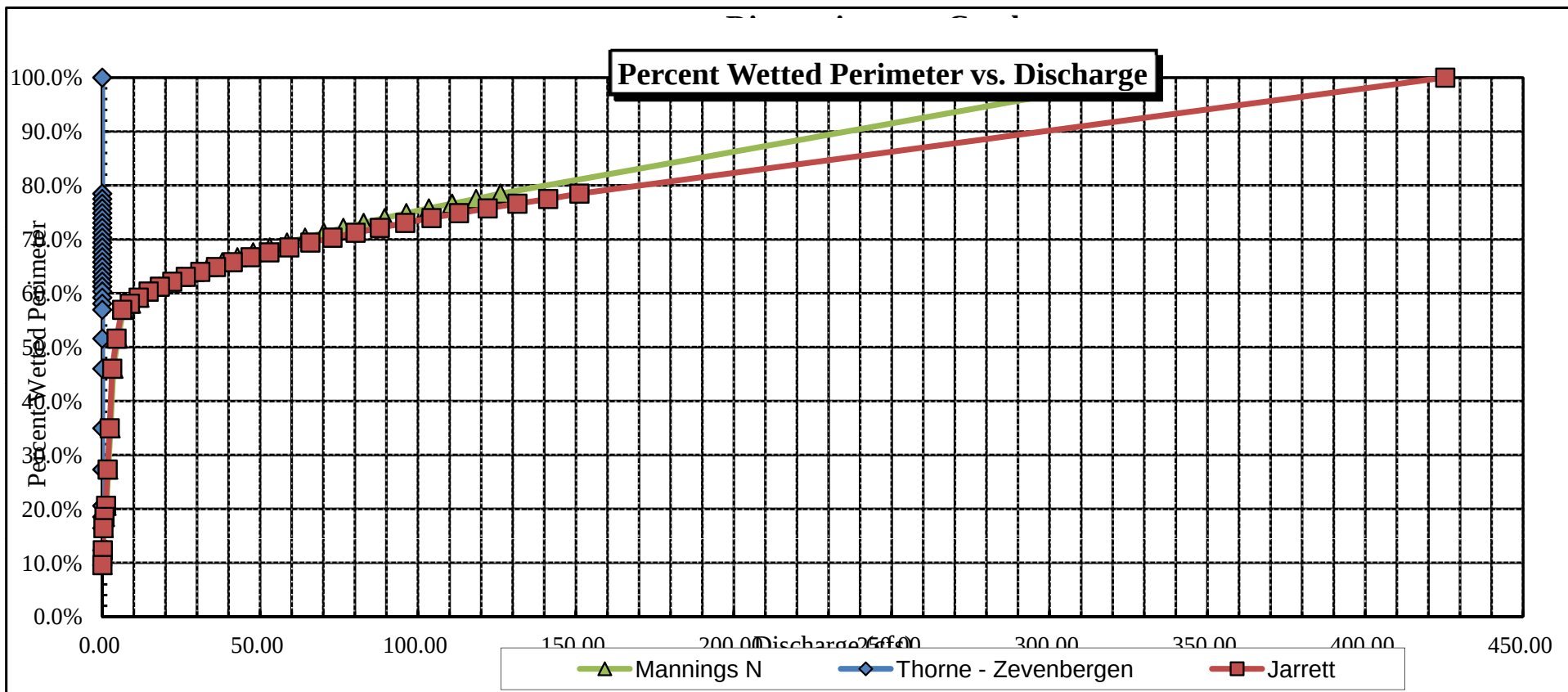
STREAM NAME: Disappointment Creek
 XS LOCATION: 1500 ft. upst from county road bridge
 XS NUMBER: 1 Jarrett Variable Manning's n Correction Applied

GL = lowest Grassline elevation corrected for sag

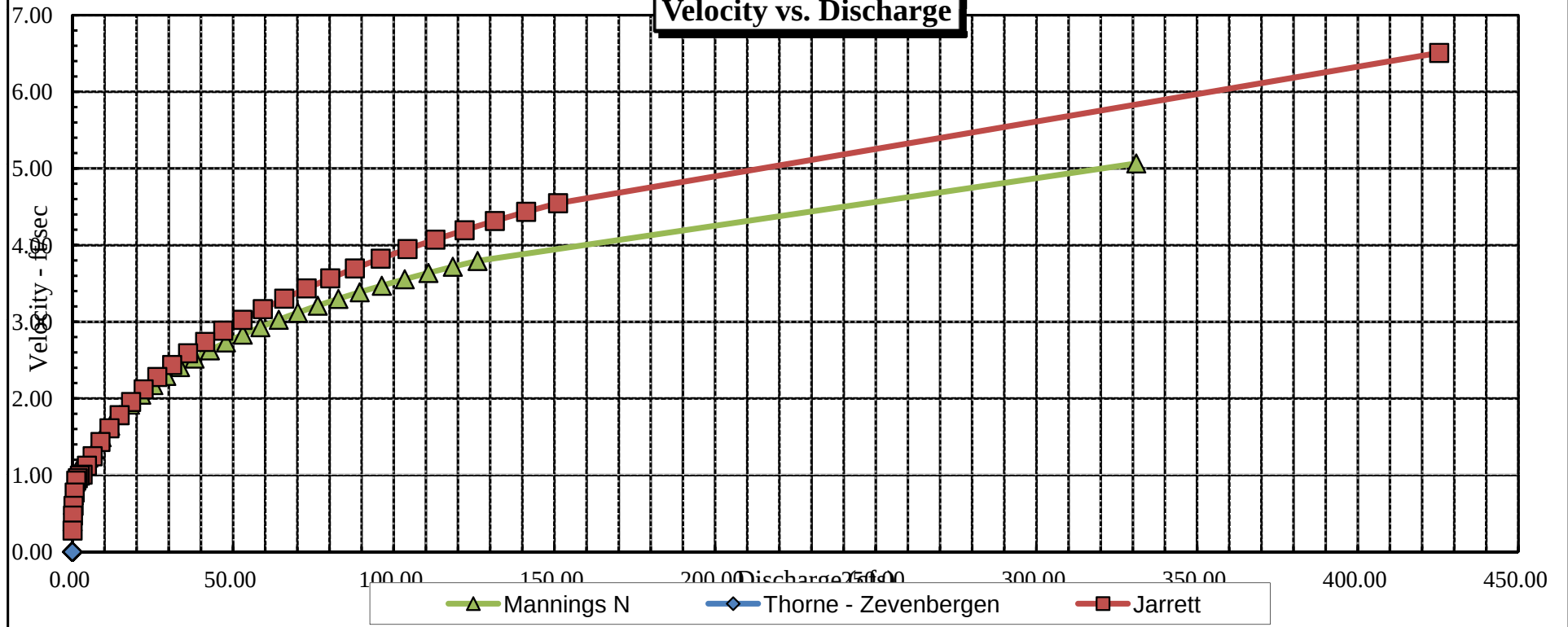
STAGING TABLE *WL* = Waterline corrected for variations in field measured water surface elevations and sag

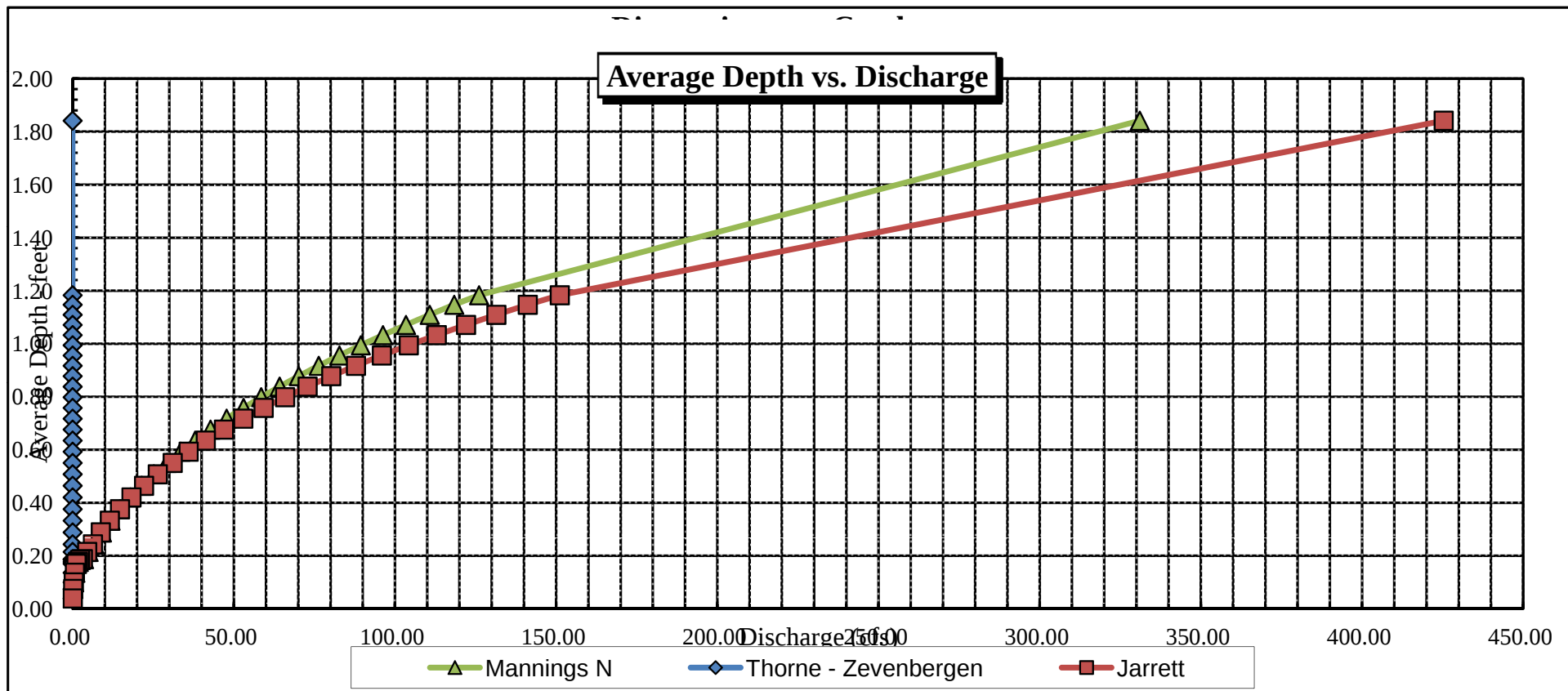
	DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
GL	5.84	35.50	1.84	2.66	65.36	36.59	100.0%	1.79	425.33	6.51
	6.85	28.10	1.18	1.65	33.24	28.71	78.5%	1.16	151.13	4.55
	6.90	27.76	1.15	1.60	31.84	28.35	77.5%	1.12	141.21	4.43
	6.95	27.47	1.11	1.55	30.46	28.03	76.6%	1.09	131.45	4.32
	7.00	27.17	1.07	1.50	29.10	27.71	75.7%	1.05	122.04	4.19
	7.05	26.88	1.03	1.45	27.75	27.39	74.9%	1.01	112.97	4.07
	7.10	26.57	0.99	1.40	26.41	27.06	73.9%	0.98	104.28	3.95
	7.15	26.25	0.96	1.35	25.09	26.72	73.0%	0.94	95.93	3.82
	7.20	25.94	0.92	1.30	23.78	26.39	72.1%	0.90	87.91	3.70
	7.25	25.63	0.88	1.25	22.49	26.06	71.2%	0.86	80.24	3.57
	7.30	25.32	0.84	1.20	21.22	25.73	70.3%	0.82	72.90	3.44
	7.35	25.01	0.80	1.15	19.96	25.39	69.4%	0.79	65.91	3.30
	7.40	24.70	0.76	1.10	18.72	25.06	68.5%	0.75	59.25	3.16
	7.45	24.39	0.72	1.05	17.49	24.73	67.6%	0.71	52.93	3.03
	7.50	24.08	0.68	1.00	16.28	24.40	66.7%	0.67	46.94	2.88
	7.55	23.77	0.63	0.95	15.08	24.06	65.8%	0.63	41.30	2.74
	7.60	23.46	0.59	0.90	13.90	23.73	64.9%	0.59	36.00	2.59
	7.65	23.14	0.55	0.85	12.74	23.40	64.0%	0.54	31.04	2.44
	7.70	22.83	0.51	0.80	11.59	23.07	63.0%	0.50	26.43	2.28
	7.75	22.52	0.46	0.75	10.46	22.73	62.1%	0.46	22.16	2.12
	7.80	22.21	0.42	0.70	9.34	22.40	61.2%	0.42	18.25	1.95
WL	7.85	21.90	0.38	0.65	8.23	22.07	60.3%	0.37	14.68	1.78
	7.90	21.50	0.33	0.60	7.15	21.66	59.2%	0.33	11.52	1.61
	7.95	21.10	0.29	0.55	6.09	21.24	58.1%	0.29	8.72	1.43
	8.00	20.70	0.24	0.50	5.04	20.83	56.9%	0.24	6.28	1.25
	8.05	18.77	0.21	0.45	4.03	18.87	51.6%	0.21	4.53	1.12
	8.10	16.75	0.19	0.40	3.14	16.83	46.0%	0.19	3.16	1.01
	8.15	12.73	0.18	0.35	2.35	12.79	35.0%	0.18	2.34	0.99
	8.20	9.95	0.18	0.30	1.76	9.99	27.3%	0.18	1.69	0.96
	8.25	7.50	0.17	0.25	1.27	7.53	20.6%	0.17	1.18	0.93
	8.30	6.75	0.14	0.20	0.92	6.77	18.5%	0.14	0.71	0.77
	8.35	6.00	0.10	0.15	0.60	6.01	16.4%	0.10	0.36	0.60
	8.40	4.50	0.07	0.10	0.34	4.51	12.3%	0.07	0.16	0.47
	8.45	3.50	0.04	0.05	0.14	3.50	9.6%	0.04	0.04	0.28





Velocity vs. Discharge





Stage vs. Discharge

