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

Dear Ms. Bassi:

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

Location and Land Status. Rock Creek originates on the south flank of Slide Mountain, approximately nine miles northeast of Kremmling. Rock Creek flows into the Colorado River approximately eight miles east of Kremmling. This recommendation addresses the portion of Rock Creek that starts at the headwaters and extends downstream to the confluence with the Colorado River, a distance of approximately 5.6 miles. The BLM manages 0.85 miles of this reach, while approximately 4.75 miles are in private ownership.

Biological Summary. Rock Creek is a cold water, moderate gradient stream. The reach that is the subject of this recommendation flows through a valley that ranges from ¼ to one mile in width. The reach begins on forested lands, and then flows through agricultural lands primarily used for hay meadows and hobby ranching.

Substrate is generally small in size, ranging from sands to cobbles. Water quality is within an acceptable range for supporting cold water species, but at times the stream may experience stream temperatures and conductivity that are at the upper end of the acceptable range of water quality. The stream is comprised primarily of deep run habitat and good undercut banks for fish cover, but with limited riffle habitat.

Fish surveys have documented a self-supporting population of brook trout, but the population is not high density. Spot surveys have documented populations of mayfly and caddisfly. The riparian community is comprised primarily of willows, sedges and grasses.

R2Cross Analysis. The BLM collected the following R2Cross data from Rock Creek:

Cross Section Date	Discharge Rate	Top Width	Winter Flow Recommendation (meets 2 of 3 hydraulic criteria)	Summer Flow Recommendation (meets 3 of 3 hydraulic criteria)
07/14/2020 #1	1.49 cfs	4.60 feet	0.74 cfs	1.04 cfs
07/14/2020 #2	1.51 cfs	5.50 feet	0.68 cfs	1.70 cfs
		Averages:	0.71 cfs	1.37 cfs

BLM's analysis of this data indicates that the following flows are needed to protect the natural environment to a reasonable degree.

> 1.35 cubic feet per second is recommended during the snowmelt runoff period and summer, from May 1 through August 31. This recommendation is driven by

the average velocity criteria. Rock Creek has limited riffle habitat, so protecting this flow rate will ensure that the limited habitat can be fully utilized during the spring and summer period, when fish are spawning and moving actively between pools.

0.70 cubic feet per second is recommended during late summer and fall from September 1 through November 30. This recommendation is driven by the average depth criteria. This flow rate should provide adequate physical habitat for the fish population to complete important parts of its life cycle before cold temperatures arrive.

0.5 cubic feet per second is recommended during the cold weather period from December 1 through April 30. This recommendation is driven by naturally limited water availability. This flow should prevent pools from completely icing and will allow the fish population to successfully overwinter.

Water Availability. The BLM recommends using a variety of data sources to confirm water availability, because BLM is not aware of any historical gage data on this creek. Use of Streamstats can provide an estimate of natural hydrology. One nearby gage may provide an estimate of the seasonality of flows, because it is located on a watershed with similar characteristics. USGS Gage 09040000, on East Troublesome Creek, is located on a larger watershed but appears to be relatively unaffected by diversion and storage operations. Analysis of diversion records for the Williams No. 1 and No. 2 Ditches would also provide some documentation of flows available in Rock Creek.

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

Williams No. 1 Ditch – 0.625 cfs, 1917 priority
Williams No. 2 Ditch – 0.875 cfs, 1917 priority
Rock Creek Ditch – 2.125 cfs, 1914 priority
Grom Ditch – 3.0 cfs, 1909 priority

BLM is aware that a significant percentage of the base flow of the creek is provided by a large spring located on private lands. During the irrigation season, base flows are supplemented by water imported by Musgrave Ditch, which diverts from Corral Creek to the east.

Relationship to Land Management Plans. The BLM's management plan calls for actions to maintain and enhance habitat that supports fish species. In addition, the BLM plan calls for making instream flow recommendations to the Colorado Water Conservation Board to meet minimum instream flow requirements to maintain fisheries. Finally, the plan calls for maintaining and improving the function of riparian areas to achieve advanced ecological stage for the riparian community, and it also calls for protecting riparian and wetland systems from activities that could degrade those habitats. Establishing an instream flow water right would assist in meeting these objectives.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section

were included with BLM's draft recommendation in February 2021. BLM thanks both Colorado Parks and Wildlife and the Colorado Water Conservation Board for their cooperation in this effort.

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

Sincerely,

Deputy State Director
Resources

Cc: Bill Mills, Kremmling FO
Paula Belcher, Kremmling Field Office
Northwest District Manager

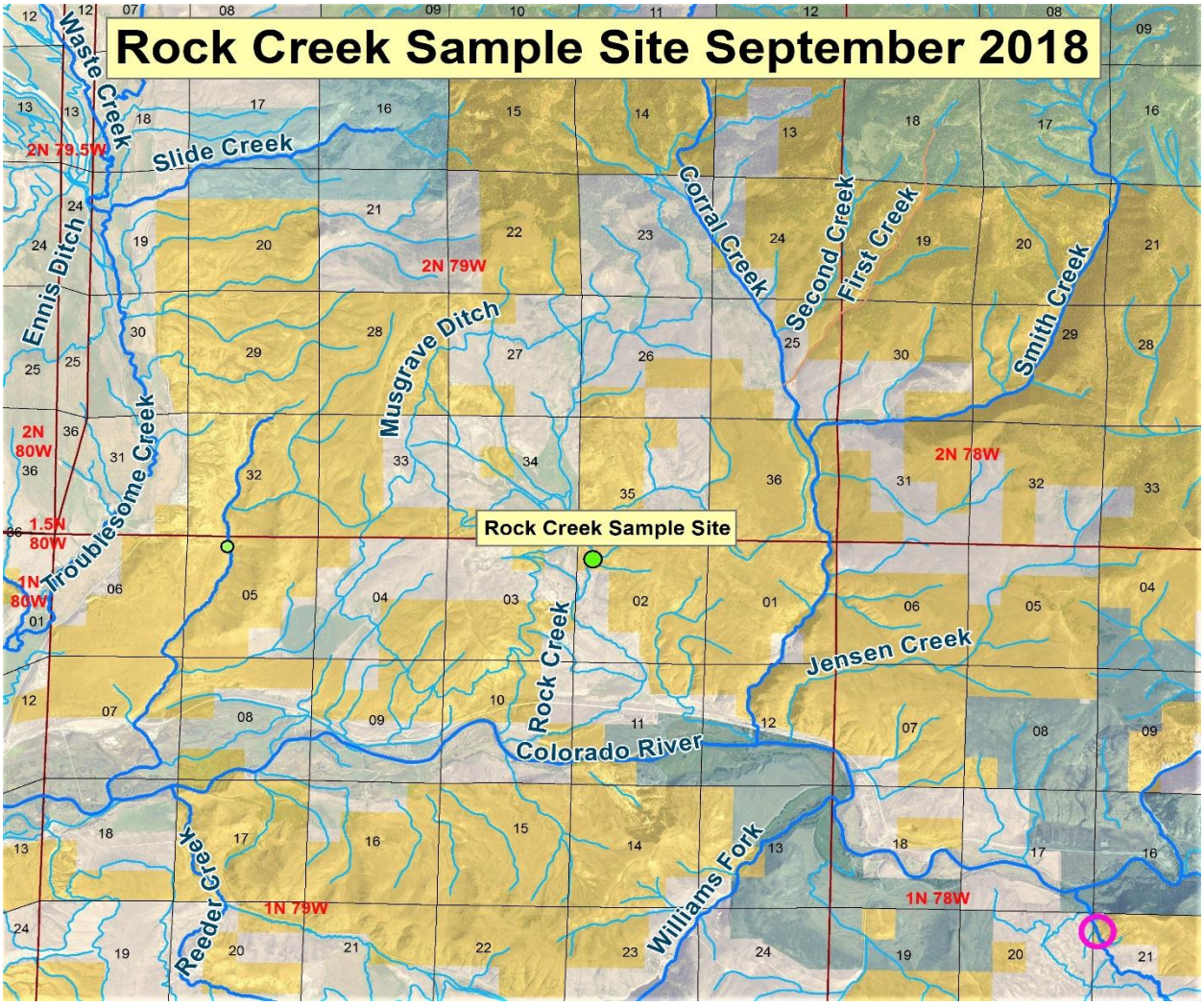
Kremmling Field Office

Stream Surveys September 2018

Rock Creek – Water Code: 23705

Introduction:

Rock Creek, located northeast of Kremmling, Colorado on public lands managed by the Kremmling Field Office, was visited on September 21, 2019. The intended purpose of this site visit was to survey the stream for fish, and if present, assess species composition and obtain a population estimate. The stream had not been previously surveyed at the location and there were no historic records. A single backpack electrofishing unit was used to complete a two-pass removal effort over a reach length of 306 feet. The survey location is just below the confluence with Dry Gulch. Personnel present for the survey were Tom Fresques, BLM NWD Fish Biologist and Ross McNearney, BLM Fish Technician.



Discussion:
Brook Trout were the only species collected or seen during the survey. A total of 19 fish were captured all on the first pass. No fish were seen or collected on the second pass. **The population estimate at the site is 19 adult fish (≥150 mm total length) + or – 1 fish, and 328 adult fish (≥150 mm total length) + or – 9 fish per stream mile.** The sample had limited size class diversity, but at least 3 age classes were noted with the majority of fish being adults.

The stream was small and narrow but was deep with excellent undercut banks and good sedge cover. Riparian vegetation was comprised primarily of sedges, willows, grasses, and a few alders. Stream habitat was primarily deep run habitat with a few nice pools associated with a couple of meander bends. Limited riffle habitat was present. Substrate was primarily comprised of gravels and cobbles.

Recommendations:

- Consider sampling other BLM portions of the stream to determine Brook Trout distribution in the stream
- Add this stream to the NWD Fish Bearing Stream GIS Layer

Adult Brook Trout captured during the survey

Representative stream habitat within the sample reach

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Rock Creek						CROSS-SECTION NO.: 1
CROSS-SECTION LOCATION: 1.4 miles up County Rd. 21						
DATE: 7-14-20	OBSERVERS: R. Smith, A. Williams					
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 2	TOWNSHIP: 1 (N)/S	RANGE: 79E/(W)	PM: 6th	
COUNTY: Grand	WATERSHED: Colorado R.	WATER DIVISION: 5	DOW WATER CODE: 23705			
MAP(S): USGS: Toko. 13 396278 40.084 W						
MAP(S): USFS: 4437867						

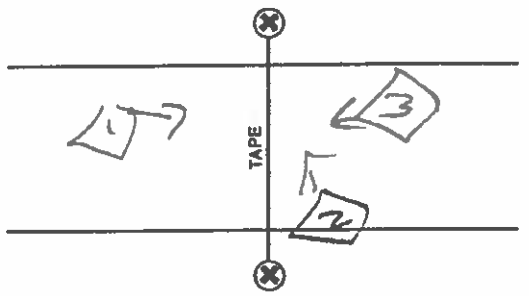
SUPPLEMENTAL DATA

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

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	6.05/6.05
② WS Upstream	12.8	5.99
③ WS Downstream	8.2	6.06
SLOPE	0.07 / 21.0 =	0.0033

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

Willow - Narrowleaf Cottonwood Riparian
pH = 7.01 Cond = 416
Temp = 16.7°C Salinity = 0.2

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Rock Creek	CROSS-SECTION NO.: 1	DATE: 5-14-2	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: _____ ft	TIME: 1:15

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	0.0		5.05								
VBF	2.9		5.55								
W	3.0		6.05								
	3.2		6.4	0.35				0.11			
	3.4		6.4	0.35				0.45			
	3.6		6.4	0.35				0.77			
	3.8		6.4	0.35				0.93			
	4.0		6.4	0.35				1.20			
	4.2		6.35	[illegible]				1.40			
	4.4		6.35	0.30				1.53			
	4.6		6.35	0.30				1.60			
	4.8		6.35	0.30				1.68			
	5.0		6.35	0.30				1.66			
	5.2		6.35	0.30				1.69			
	5.4		6.35	0.30				1.63			
	5.6		6.35	0.30				1.65			
	5.8		6.4	0.35				1.63			
	6.0		6.4	0.35				1.58			
	6.2		6.45	0.4				1.38			
	6.4		6.45	0.4				1.12			
	6.6		6.35	0.3				0.61			
	6.8		6.3	0.25				0.23			
	7.0		6.25	0.2				0			
	7.2		6.20	0.15				0			
W	7.4		6.05								
BF	7.5	5.54	5.54								
LS	10.3		5.15								
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: Rock Creek					CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: 1.4 miles up County Rd. 21						
DATE: 7-14-20	OBSERVERS: K. Smith, A. Williams					
LEGAL DESCRIPTION	¼ SECTION: NW	SECTION: 2	TOWNSHIP: 1 (N)/S	RANGE: 77 E/(W)	PM: 6th	
COUNTY: Grand	WATERSHED: Colo. River	WATER DIVISION: 5	DOW WATER CODE: 23705			
MAP(S): USGS: Zone 13 396287		40.0847 N -106.2165 W				
USFS: 4437567						

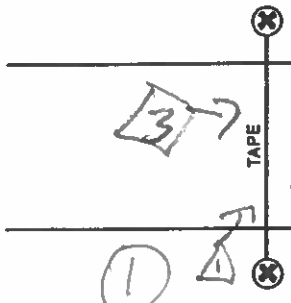
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravels to sand	PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS: 3		

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	6.38 / 6.38
② WS Upstream	12.6	6.26
③ WS Downstream	5.5	6.41
SLOPE	0.15 / 18.1 = .0083	

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

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Rock Creek | CROSS-SECTION NO: 2 | DATE: 7-14-20 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 2:00 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) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
LS	0.0		5.42								
BF	1.5		5.80								
W	1.8		6.10								
	2.0		6.7	0.3				0.50			
	2.2		6.7	0.3				0.91			
	2.4		6.7	0.3				1.17			
	2.6		6.7	0.3				1.22			
	2.8		6.75	0.25				1.14			
	3.0		6.7	0.30				1.31			
	3.2		6.75	0.35				1.41			
	3.4		6.7	0.3				1.38			
	3.6		6.7	0.3				1.48			
	3.8		6.7	0.3				1.12			
	4.0		6.65	0.25				0.84			
	4.2		6.65	0.25				0.72			
	4.4		6.65	0.25				0.65			
	4.6		6.7	0.3				0.93			
	4.8		6.7	0.3				0.80			
	5.0		6.75	0.35				0.70			
	5.2		6.75	0.35				0.97			
	5.4		6.8	0.41				1.16			
	5.6		6.85	0.45				1.04			
	5.8		6.85	0.45				1.04			
	6.0		6.85	0.45				0.78			
	6.2		6.85	0.45				0.65			
	6.4		6.80	0.4				0.46			
W	6.7		6.40								
RBF	7.0		5.80								
LS	9.4		5.36								
TOTALS:											

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

STREAM NAME: Rock Creek
XS LOCATION: UTM Zone 13 396278 4437867
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	1.49	cfs
CALCULATED FLOW (Qc)=	1.49	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	6.05	ft
CALCULATED WATERLINE (WLc)=	6.05	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.40	ft
MAX CALCULATED DEPTH (Dc)=	0.40	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	1.13	ft/sec
MANNING'S N=	0.032	
SLOPE=	0.0033	ft/ft
.4 * Qm =	0.6	cfs
2.5 * Qm=	3.7	cfs

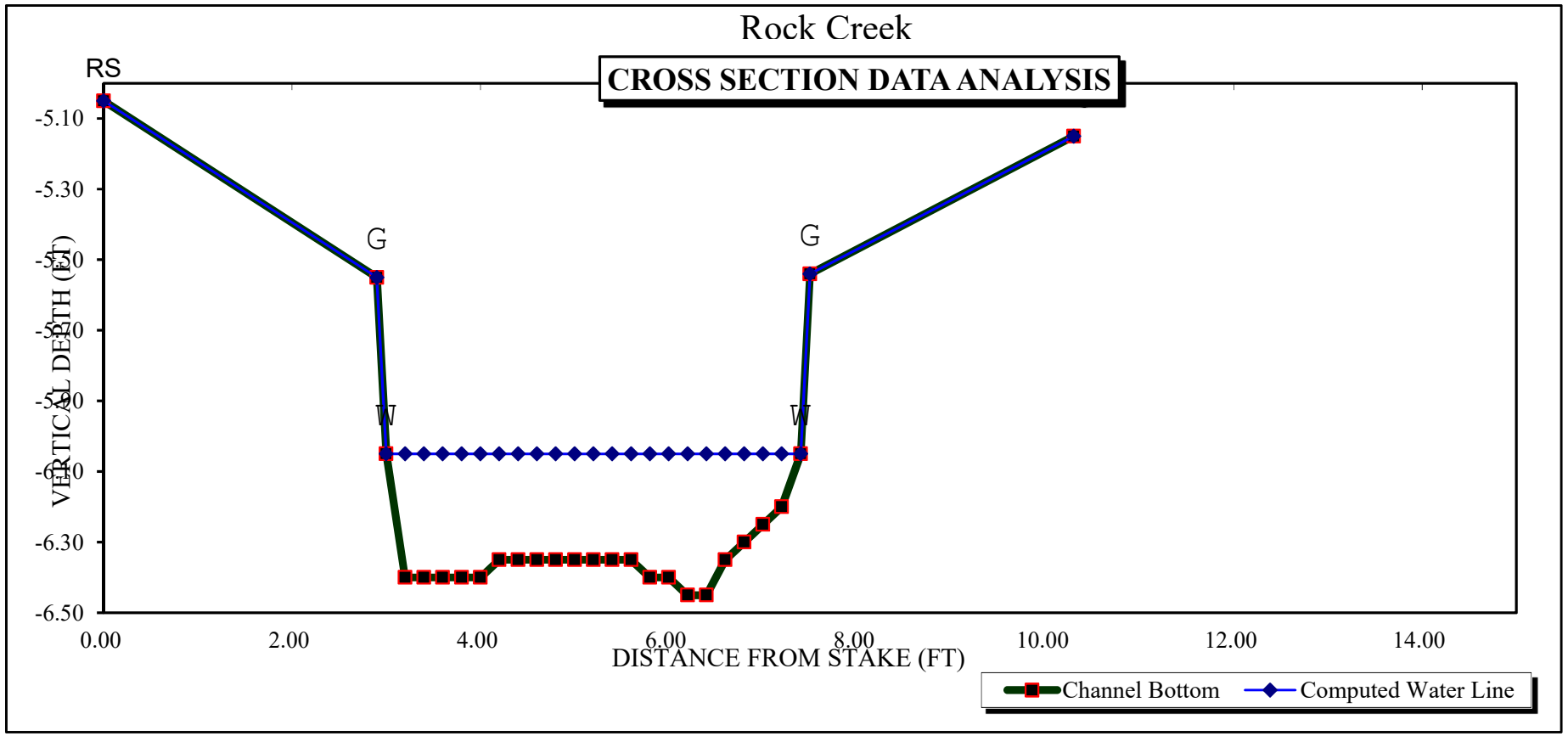
RECOMMENDED INSTREAM FLOW:
==========

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

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

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

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


Rock Creek
CROSS SECTION DATA ANALYSIS
RS
G
G
W
W
-5.10
-5.30
-6.10
-6.30
-6.50
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
VERTICAL DEPTH (FT)
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

STREAM NAME: Rock Creek
XS LOCATION: UTM Zone 13 396287 4437867
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	1.51	cfs
CALCULATED FLOW (Qc)=	1.51	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	6.40	ft
CALCULATED WATERLINE (WLc)=	6.40	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.45	ft
MAX CALCULATED DEPTH (Dc)=	0.45	ft
(Dm-Dc)/Dm * 100	0.0	%
MEAN VELOCITY=	0.96	ft/sec
MANNING'S N=	0.062	
SLOPE=	0.0083	ft/ft
.4 * Qm =	0.6	cfs
2.5 * Qm=	3.8	cfs

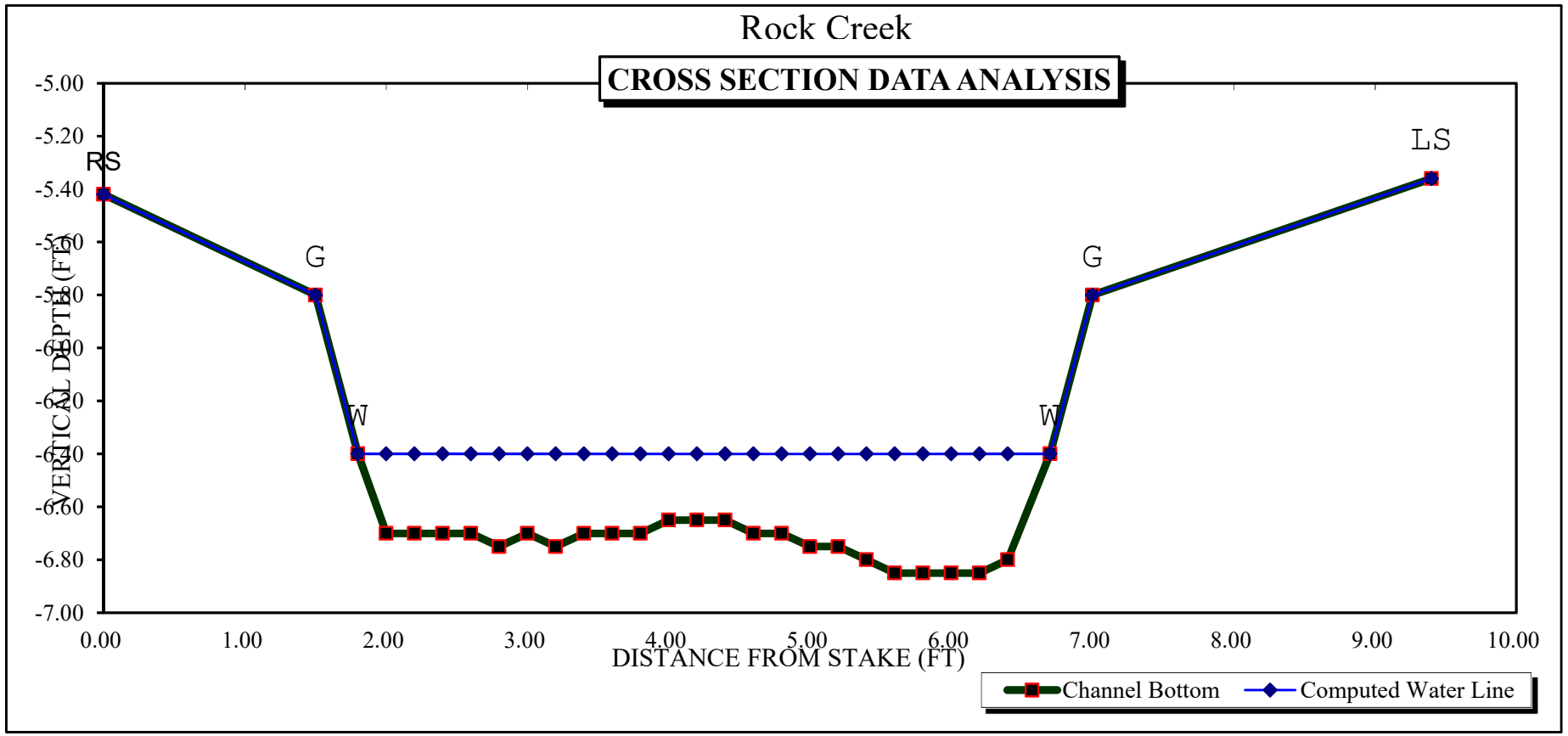
RECOMMENDED INSTREAM FLOW:
==========

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

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

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

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


Rock Creek
CROSS SECTION DATA ANALYSIS
RS
G
W
W
G
LS
-5.00
-5.20
-5.40
-5.60
-5.80
-6.00
-6.20
-6.40
-6.60
-6.80
-7.00
VERTICAL DEPTH (FT)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line