United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215-7093
www.blm.gov/co

TAKE PRIDE IN AMERICA

In Reply Refer To:
7250 (CO-932)

DEC 1 1 2009

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 Tabeguache Creek, located in Water Division 4.

Location and Land Status: Tabeguache Creek is tributary to the San Miguel River near the historic town site of Uravan, approximately 11 miles northwest of Naturita. The entire creek and its watershed are located within Montrose County. This recommendation covers two stream reaches. The first reach begins at the confluence with Fortyseven Creek and extends downstream to the headgate of the Templeton Ditch, a distance of approximately 4.5 miles. The second reach begins at the headgate of the Templeton Ditch and extends to the confluence with the San Miguel River; a distance of approximately 7.2 miles. Within these reaches, the BLM manages all the land along the creek, with the exception of three privately-owned parcels that total approximately 3 stream miles.

Biological Summary: Most of the upper reach is a moderate gradient stream within a confined canyon that allows for some channel movement during high flow events. The substrate consists mostly of cobbles that are regularly moved during high flow events. The narrowleaf cottonwood-sandbar willow-skunkbrush sumac riparian community is vigorous, and shows evidence of new riparian recruitment on sand bars that are formed during high flow events. The upper reach supports a beaver community, and beaver ponds on side channels are common. Fishery surveys indicate that this part of reach provides habitat for a self-sustaining rainbow trout and speckled dace populations.

The reach below the headgate of the Templeton Ditch is characterized by a slightly wider stream valley, and larger substrate. The stream channel is larger because of high-volume, short-duration snowmelt runoff flows from Shavano, Campbell, and Spring creeks. The creek supports a narrowleaf cottonwood-sandbar willow-skunkbrush sumac-chokecherry riparian community. Fishery surveys indicate that the lower part of the reach is important for sensitive species habitat.

Stream samples during spring spawning season have documented flannelmouth sucker and roundtail chub. In addition, surveys have documented the presence of red shiner and speckled dace. It is likely that both the sensitive and non-sensitive species move into the creek from the San Miguel River to spawn, most likely when they are cued by rising stream temperatures.

R2Cross Analysis: The BLM's data analysis, coordinated with the Colorado Division of Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

Upper Reach – Confluence with Fortyseven Creek to Headgate of Templeton Ditch

4.75 cubic feet per second (cfs) is recommended for the snowmelt runoff period from April 1 to June 30. This recommendation is driven by the average depth and average velocity criteria. Maintenance of adequate depth and velocities is important for insuring that spawning fishes have full access to habitat throughout the stream channel.

1.9 cfs is recommended for the late summer through early fall, from July 1 through November 30. This recommendation is driven by the wetted perimeter criterion and by water availability. Tabeguache Creek has a large channel due to large snowmelt runoff flows. Keeping at least 50 percent of this channel wetted is important during the fall, when fish are still feeding in preparation for overwintering.

1.6 cfs is recommended for the winter period from December 1 to March 14. This flow rate is driven by water availability, but still comes close to meeting the wetted perimeter and depth criteria in many of the cross sections that were analyzed as part of this recommendation. This flow rate should provide adequate overwintering habitat.

Lower Reach – Headgate of Templeton Ditch to Confluence with San Miguel River

4.75 cfs is recommended for the snowmelt runoff period from March 15 to June 30. This recommendation is designed to provide adequate habitat for sensitive fish species during the typical spawning period each year. This recommendation is driven by the average depth and average velocity criteria. These flows should allow passage over obstacles that are common in the creek, such as large boulders and woody debris.

Water Availability: No long-term, reliable gage data is available for Tabeguache Creek. As an alternative, the BLM recommends using long-term gage data available from the San Miguel River, and conducting a basin apportionment to reflect the smaller size of the Tabeguache Creek watershed.

Numerous water rights are located on tributaries to Tabeguache Creek and a handful of water rights are located on the main stem of Tabeguache Creek. The following list of water rights is organized by geographic location. Many of these water rights have been in non-use status, so a careful check of diversion histories with the local water commissioner is warranted. In addition,

many of these diversions are limited to the snowmelt runoff period, when small tributaries to Tabeguache Creek flow for a brief duration of time.

Spring Creek-tributary to Tabeguache Creek approximately one mile upstream from mouth

- Crabtree Ditch – 6 cfs
- Burrow Creek Ditch – 0.87 cfs

Campbell Creek-tributary to Tabeguache Creek approximately three miles upstream from mouth

- West Campbell Ditch – 2 cfs
- Merrifield Ditch – 2 cfs

Shavano Creek-tributary to Tabeguache Creek approximately five miles upstream from mouth

- East Shavano Ditch and Pipeline – 0.18 cfs
- East Shavano Meadow Ditch – 1 cfs

Fortyseven Creek-tributary to Tabeguache Creek at upper terminus of proposed ISF reach

- Meadow Ditch – 4 cfs
- Fortyseven Creek Ditch – 4 cfs
- Bennett Ditch – 1.5 cfs

Main Stem Tabeguache Creek

- Glencoe Ditch – 17 cfs – located near headwaters upstream from proposed ISF reach
- Skees Ditch – 1.92 cfs – located approximately 2.5 miles below upper terminus of proposed ISF reach
- Templeton Ditch – 5.5 cfs – located approximately 4.5 miles below upper terminus of proposed ISF reach

The BLM has confirmed, through conversations with the ditch owners, that Tabeguache Creek has reliable flows to the headgate of the Templeton Ditch. Depending upon hydrologic conditions, the Templeton Ditch can sweep the creek during the later part of the irrigation season, from July 1 through October 31.

Relationship to Management Plans: This recommendation is important to the BLM management objectives because the upper portion of the reach is located within the legislatively-protected "Tabeguache Special Management Area." The area was protected because of its wilderness qualities, but the legislation provided no protection for water resources. In addition, the lower portion of the reach is important because the BLM is a signatory to a multi-state conservation agreement for the preservation of flannelmouth sucker, bluehead sucker, and roundtail chub. Under this agreement, appropriation of instream flows is considered to be a

proactive protective action that can assist in preventing these species from becoming listed under the Endangered Species Act.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section to support this recommendation were provided with BLM's draft recommendation in February 2008. We thank both the Division of Wildlife and the 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,

Linda Anania

Linda Anania
Deputy State Director, Resources and Fire

cc: Dennis Murphy, Uncompahgre Field Office
Barb Sharrow, Uncompahgre Field Office
Tom Fresques, Glenwood Spring Field Office

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TAKE PRIDE IN AMERICA

RECEIVED
JAN 05 2009
Colorado Water Conservation Board

In Reply Refer To:
7250 (CO-932)

DEC 30 2008

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

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Location and Land Status: Tabeguache Creek is tributary to the San Miguel River near the historic town site of Uravan, approximately 11 miles northwest of Naturita. The entire creek and its watershed are located within Montrose County. This recommendation covers two stream reaches. The first reach begins at the confluence with Fortyseven Creek and extends downstream to the headgate of the Templeton Ditch, a distance of approximately 4.5 miles. The second reach begins at the headgate of the Templeton Ditch and extends to the confluence with the San Miguel River; a distance of approximately 7.2 miles. Within these reaches, the BLM manages all the land along the creek, with the exception of three privately-owned parcels that total approximately 3 stream miles.

Biological Summary: Most of the upper reach is a moderate gradient stream within a confined canyon that allows for some channel movement during high flow events. The substrate consists mostly of cobbles that are regularly moved during high flow events. The narrowleaf cottonwood-sandbar willow-skunkbrush sumac riparian community is vigorous, and shows evidence of new riparian recruitment on sand bars that are formed during high flow events. The upper reach supports a beaver community, and beaver ponds on side channels are common. Fishery surveys indicate that this part of reach provides habitat for a self-sustaining rainbow trout and speckled dace populations.

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Stream samples during spring spawning season have documented flannelmouth sucker and roundtail chub. In addition, surveys have documented the presence of red shiner and speckled dace. It is likely that both the sensitive and non-sensitive species move into the creek from the San Miguel River to spawn, most likely when they are cued by rising stream temperatures.

R2Cross Analysis: The BLM's data analysis, coordinated with the Division of Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree.

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- 4.75 cubic feet per second (cfs) is recommended for the snowmelt runoff period from March 15 to June 30. This recommendation is driven by the average depth and average velocity criteria. Maintenance of adequate depth and velocities is important for insuring that spawning fishes have full access to habitat throughout the stream channel.

- 1.9 cfs is recommended for the late summer through early fall, from July 1 through November 30. This recommendation is driven by the wetted perimeter criterion and by water availability. Tabeguache Creek has a large channel due to large snowmelt runoff flows. Keeping at least 50 percent of this channel wetted is important during the winter so that the fish population has adequate overwintering habitat.

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Lower Reach – Headgate of Templeton Ditch to Confluence With San Miguel River

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Water Availability: No long-term, reliable gage data is available for Tabeguache Creek. As an alternative, we recommend using the synthetic hydrograph methodology developed by the BLM for the Uncompahgre Plateau to obtain an estimate of water availability. This methodology has been used numerous times by the CWCB for BLM recommendations on the Uncompahgre Plateau, where there is a lack of reliable gage data

Numerous water rights are located on tributaries to Tabeguache Creek and a handful of water rights are located on the main stem of Tabeguache Creek. The following list of water rights is

organized by geographic location. Many of these water rights have been in non-use status, so a careful check of diversion histories with the local water commissioner is warranted. In addition, many of these diversions are limited to the snowmelt runoff period, when small tributaries to Tabeguache Creek flow for a brief duration of time.

Spring Creek-tributary to Tabeguache Creek approximately one mile upstream from mouth

- Crabtree Ditch – 6 cfs
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Campbell Creek-tributary to Tabeguache Creek approximately three miles upstream from mouth

- West Campbell Ditch – 2 cfs
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Main Stem Tabeguache Creek

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The BLM has confirmed, through conversations with the ditch owners, that Tabeguache Creek has reliable flows to the headgate of the Templeton Ditch. Depending upon hydrologic conditions, the Templeton Ditch can sweep the creek during the later part of the irrigation season, from July 1 through October 31.

Relationship to Management Plans: This recommendation is important to BLM management objectives because the upper portion of the reach is located within the legislatively-protected "Tabeguache Special Management Area." The area was protected because of its wilderness qualities, but the legislation provided no protection for water resources. In addition, the lower

portion of the reach is important because the BLM is a signatory to a multi-state conservation agreement for the preservation of flannelmouth sucker, bluehead sucker, and roundtail chub. Under this agreement, appropriation of instream flows is considered to be a proactive protective action that can assist in preventing these species from becoming listed under the Endangered Species Act.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section to support this recommendation were provided with BLM's draft recommendation in February 2008. We thank both the Division of Wildlife and the 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,

for Linda Anania
Deputy State Director, Resources and Fire

cc:
Dennis Murphy, Uncompahgre Field Office
Barb Sharrow, Uncompahgre Field Office
Tom Fresques, Glenwood Spring Field Office

DRAFT INSTREAM FLOW RECOMMENDATION – TABEGUACHE CREEK, WD 4

Feb. 13, 2008

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 Tabeguache Creek, located in Water Division 4.

Location and Land Status. Tabeguache Creek is tributary to the San Miguel River near the historic town site of Uravan, approximately 11 miles northwest of Naturita. The entire creek and its watershed are located within Montrose County. This recommendation covers a reach beginning at the confluence with Fortyseven Creek and extends downstream to the confluence with the San Miguel River, a distance of approximately 11.7 miles. Within this reach, BLM manages all the land, with the exception of three privately-owned parcels that total approximately 3 stream miles.

Biological Summary. Most of the upper part of the reach is a moderate gradient stream within a confined canyon that allows for some channel movement during high flow events. The substrate consists mostly of cobbles that are regularly moved during high flow events. The narrowleaf cottonwood-sandbar willow-skunkbrush sumac riparian community is vigorous, and shows evidence of new riparian recruitment on sand bars that are formed during high flow events. The upper reach supports a beaver community, and beaver ponds on side channels are common. Fishery surveys indicate that this part of reach provides habitat for a self-sustaining rainbow trout and speckled dace populations.

Below the headgate of the Templeton Ditch, the reach is characterized by a slightly wider stream valley, and larger substrate. The stream channel is larger because of high-volume, short-duration snowmelt runoff flows from Shavano, Campbell, and Spring creeks. The creek supports a narrowleaf cottonwood-sandbar willow-skunkbrush sumac-chokecherry riparian community. (DENNIS – do we have information about whether Tabeguache supports any rare riparian communities or species down here?) Fishery surveys indicate that the lower part of the reach is important for sensitive species habitat. Stream samples during spring spawning season have documented flannelmouth sucker and roundtail chub. In addition, surveys have documented the presence of red shiner and speckled dace. It is likely that both the sensitive and non-sensitive species move into the creek from the San Miguel River to spawn, most likely when they are cued by rising stream temperatures.

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>
> 1.6 cfs is recommended for the winter period from December 1 to March 14. This flow rate is driven by water availability, but still comes close to meeting the wetted perimeter and depth criteria in many of the cross sections that were analyzed as part of this recommendation.

BLM notes that the operation of the Templeton Ditch, discussed in the section below, may cause water availability issues from July 1 through the end of the irrigation season in October. If this is confirmed, BLM will recommend that the portion of the reach below the Templeton Ditch headgate be a seasonal recommendation, covering only the period from December 1 through June 30.

Water Availability. No long-term, reliable gage data is available for Tabeguache Creek. As an alternative, we recommend using the synthetic hydrograph methodology developed by BLM for the Uncompahgre Plateau to obtain an estimate of water availability. This methodology has been used numerous time by the CWCB for BLM recommendations on the Uncompahgre Plateau, where there is a lack of reliable gage data. A summary of this methodology, along with a spreadsheet containing monthly mean flow calculations, is provided as an attachment to this letter.

Numerous water rights are located on tributaries to Tabeguache Creek and a handful of water rights are located on the main stem of Tabeguache Creek. The following list of water rights is organized by geographic location. Many of these water rights have been in non-use status, so a careful check of diversion histories with the local water commissioner is warranted. In addition, diversions by many of these diversions is limited to the snowmelt runoff period, when small tributaries to Tabeguache Creek flow for a brief duration of time.

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Main Stem Tabeguache Creek

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BLM has observed that Tabeguache Creek has reliable flows to the headgate of the Templeton Ditch from December 1 through June 30. Depending upon hydrologic conditions, the Templeton Ditch may sweep the creek during the later part of the irrigation season, from July 1 through October 31.

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Data sheets, R2Cross output, fishery survey information, and photographs of the cross section are enclosed to support this recommendation. We thank both the Division of Wildlife and the 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,

Linda Anania
Deputy State Director
Resources and Fire

4 Enclosures

cc: Dennis Murphy, Uncompahgre Field Office
Barb Sharrow, Uncompahgre Field Office

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Tabeguache Creek - lower					CROSS-SECTION NO.: 1
CROSS-SECTION LOCATION: Approx 0.2 miles upstream from confluence with San Miguel River					
DATE: 6-19-03	OBSERVERS: J. Skinner, R. Smith, D. Murphy				
LEGAL DESCRIPTION	¼ SECTION: NE	SECTION: 2	TOWNSHIP: 47 (N)/S	RANGE: 17 E/(W)	PM: N.M.
COUNTY: Montrose	WATERSHED: San Miguel		WATER DIVISION: 4	DOW WATER CODE: 43480	
MAP(S):	USGS: Uravan				
	USFS:				

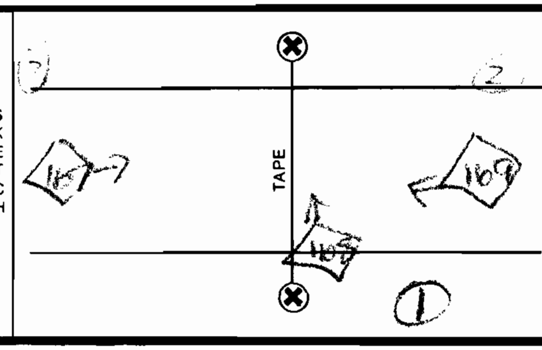
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES)/NO	METER TYPE: Marsh - McBirney			
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: surveyed lbs/foot	TAPE TENSION: surveyed lbs
CHANNEL BED MATERIAL SIZE RANGE: 6" cobbles to 3-foot boulders		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	6.43 / 6.44
(2) WS Upstream	20	6.31
(3) WS Downstream	—	—
SLOPE	0.12' / 20.0' =	0.006

SKETCH



LEGEND:

Stake ⊗

Station (1)

Photo ◇→

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
see attached																	
survey																	

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

Chironomids, black fly

COMMENTS

GPS Z 12S 0700477 4247770

PH 8.4 Cond 440 16°C

YOY FISH OBSERVED, EGGS ALSO OBSERVED

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:	CROSS-SECTION NO.:	DATE:	SHEET OF
[illegible]	1	6-19-03	1 OF 1

BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: 0.6 ft	TIME: 1305

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)
S	1		4.5								
	5		5.35								
	7		5.75								
WL	9		6.05						Ø		
	11		6.30	0.2					0.51		
	12			0.1					0.54		
	13		6.75	0.35					0.80		
	13.5		6.95	0.55					0.09		
	14		7.05	0.65					0.14		
	14.5		7.05	0.5					1.15		
	15		7.05	0.6					Ø		0
	15.5		6.90	0.5					0.39		
	16		6.75	0.2					0.16		
	16.5		6.60	0.25					0.70		
	17		6.60	0.35					0.52		
	17.5		6.65	0.30					0.49		
	18		6.90	0.40					0.64		
	18.5		7.15	0.70					0.32		
	19		7.15	0.80					0.28		
	19.5		7.20	0.75					0.64		
	20		7.05	0.10					0.98		
	20.5		7.30	0.45					0.16		
	21		6.75	0.30					0.30		
	21.5		7.10	0.40					0.64		
E	22		6.80	0.90					0.51		
	22.5			0					Ø		
	23		7.05	0.25					0.23		
	23.5		7.35	0.50					0.17		
	24		7.10	0.30					Ø		0
	24.5		7.15	0.05					Ø		0
WL	26.42		4.42	Ø					Ø		
	30		5.20								
EL	35		4.45								
TOTALS:											

End of Measurement	Time: 1320	Gage Rea[illegible] 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: Tabeguache Creek - lower						CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: Approx. 0.3 miles upstream from confluence with San Miguel River							
DATE: 6-19-03	OBSERVERS: J. Skinner, R. Smith, D Murphy						
LEGAL DESCRIPTION	¼ SECTION: NE	SECTION: 2	TOWNSHIP: 47 (N)/S	RANGE: 17 E (W)	PM: N.M.		
COUNTY: Montrose	WATERSHED: San Miguel	WATER DIVISION: 4	DOW WATER CODE: 43480				
MAP(S): USGS: Uravan	GPS 12S 0700477						
USFS:	4247770						

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES) NO	METER TYPE: Marsh-McBirney			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: 6" cobbles to 3 foot boulders	PHOTOGRAPHS TAKEN: YES/NO	NUMBER OF PHOTOGRAPHS:		

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STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
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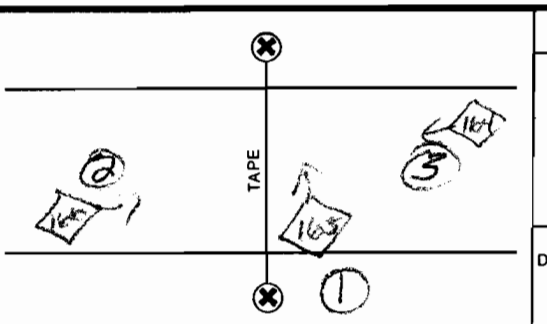
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	5.98 / 6.02
② WS Upstream	20.0	5.89
③ WS Downstream	—	—
SLOPE	0.11' / 20.0' =	0.0055

SKETCH



LEGEND:
Stake ⊗
Station ①
Photo ◇
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
see attached survey																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:
Chironomids, Black Fly,

COMMENTS

pH = 8.4 Cond = 440 Stream Temp = 16°C
Young-of-year fish observed; eggs also observed.

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:	CROSS-SECTION NO.:	DATE:	SHEET ___ OF ___
	2		

BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: 0.4 ft	TIME: 1325

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)
	0										
	12.0										
									0		
									0		
	15.5								0		
									0		
				0.2							
									0		
	19										
	19			0.3							
	20										
	21										
	22										
	23			0.5					0.12		
				0.4					0.15		
	24.5								0.05		
				0.4							
	25								0.28		
	26.5										
	27			0.5					1.02		
	28								0.41		
				0.5							
				0.2					0.0		

TOTALS:											

End of Measurement	Time:	Gage Reading: 0.4 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: [illegible] Creek						CROSS-SECTION NO.: 1
CROSS-SECTION LOCATION: 300 yds. upstream from Templeton Ditch headgate						
UTM: [illegible] 4248652 [illegible] 56?1						
DATE: 6/2/86	OBSERVERS: R. [illegible], D. Morgan					
LEGAL DESCRIPTION	¼ SECTION: NW NE	SECTION: 1	TOWNSHIP: 47 N/S	RANGE: 16 E/W	PM: N.M.	
COUNTY: Montrose	WATERSHED: San Miguel	WATER DIVISION: 4	DOW WATER CODE: 43480			
MAP(S): USGS: Uravan & Nucla 7.5'						
USFS:						

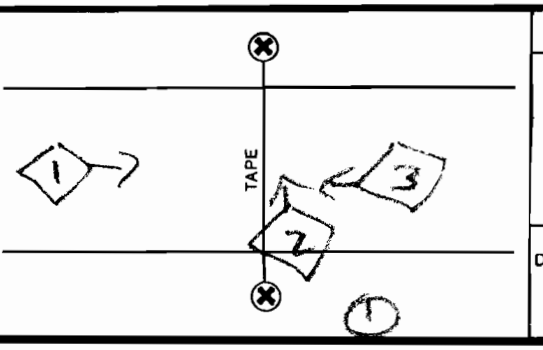
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES/NO	METER TYPE: [illegible]			
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: surveyed _____ lbs/foot	TAPE TENSION: surveyed _____ lbs
CHANNEL BED MATERIAL SIZE RANGE: [illegible]	PHOTOGRAPHS TAKEN: YES/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	[illegible]
⊗ Tape @ Stake RB	0.0	[illegible]
① WS @ Tape LB/RB	0.0	[illegible]
② WS Upstream	[illegible]	[illegible]
③ WS Downstream	24'	[illegible]
SLOPE	0.64/48' = 0.0133	

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:

caddisfly, mayfly, diptera, ephemoroptera, tricoptera

COMMENTS

Ph = 7.8 TDS = 280 Temp = 62° F

FORM #ISF FD 1-85

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:

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)
S	2.20		2.06								
G			3.18								
	4.00		3.71								
			4.14	ϕ					ϕ		
	6.00		4.39	0.20					0.00		
	7.00		4.44						0.58		
			4.38								
			4.56	0.40					1.73		
			4.79	0.60					2.24		
			4.66	0.50					2.21		
	11.00		4.57	0.40					1.58		
	11.50		4.68						1.76		
			4.63								
			4.63						2.47		
			4.74	0.55							
	13.50		4.71	0.50					2.43		
	14.00		4.67						1.73		
			4.57								
			4.51								
			4.52								
			4.39								
	17.00		4.38								
			4.33						0.65		
	21.00		4.57								
W				ϕ					ϕ		
			3.74								
G											
S											
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:					CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: 300 yds. upstream from Templeton Ditch headgate						
DATE: 6-2-06	OBSERVERS: R. Smith, D. Murphy					
LEGAL DESCRIPTION	¼ SECTION: NW NE	SECTION: 1	TOWNSHIP: 47 (N)/S	RANGE: 16 E(W)	PM: N.M.	
COUNTY: Montrose	WATERSHED: San Miguel	WATER DIVISION: 4	DOW WATER CODE: 43480			
MAP(S):	USGS: Uravan & Nucla 7.5'					
	USFS:					

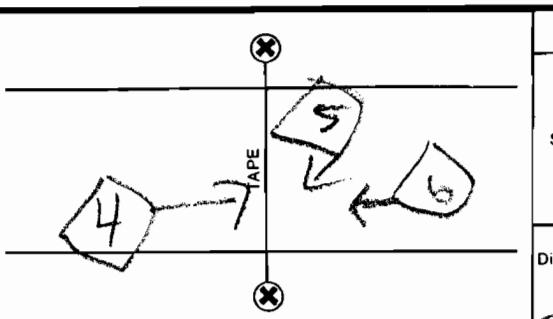
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES)/NO	METER TYPE: Marsh-McBirney			
METER NUMBER:	DATE RATED:	CALIB/SPIN: _____ sec	TAPE WEIGHT: surveyed _____ lbs/foot	TAPE TENSION: surveyed _____ lbs
CHANNEL BED MATERIAL SIZE RANGE: cobble	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	
② WS Upstream		
③ WS Downstream		
SLOPE	0.36/54.0' = 0.0066	

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:

caddis, mayfly, diptera, ephemeroptera, trichoptera.

COMMENTS

PH = 7.8 TDS = 280 Temp = 62°

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Tabeguache Creek	CROSS-SECTION NO.: 2	DATE: 6-2-06	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ___ ft	TIME: 10:45

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 (ft²)	Discharge (cfs)
S	0.00		[illegible]								
G	3.50		4.01								
W	4.50		[illegible]	∅					∅		
	5.00		5.10	0.55					0.09		
	6.00		5.14	0.30					1.21		
	7.00		5.13	0.33					1.06		
	8.00		5.27	0.50					1.30		
	9.00		5.40	0.65					0.79		
	10.00		5.19	[illegible]					1.57		
	10.50		5.34	0.60					1.57		
	11.00		5.42	[illegible]					[illegible]		
	11.50		5.46	0.70					1.27		
	12.00		5.32	[illegible]					[illegible]		
	[illegible]		5.15	0.40					[illegible]		
	14.00		5.40	[illegible]					[illegible]		
	[illegible]		5.39	[illegible]					[illegible]		
	15.00		5.22	0.45					1.61		
	16.00		5.21	[illegible]					[illegible]		
	[illegible]		5.06	[illegible]					[illegible]		
	18.00		5.09	0.30					[illegible]		
	19.00		5.20	[illegible]					0.92		
	20.00		5.20	0.40					0.51		
[illegible]	[illegible]		[illegible]	∅					∅		
[illegible]	22.00		[illegible]								
[illegible]	[illegible]		[illegible]								
TOTALS:											

End of Measurement	Time: 11:20	Gage Reading: ___ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

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

LOCATION INFORMATION

STREAM NAME:	Tabeguache Creek
XS LOCATION:	approximately 0.2 miles upstream from confluence with San Miguel
XS NUMBER:	1
DATE:	6/19/03
OBSERVERS:	Skinner, Smith and Murphy
1/4 SEC:	NE
SECTION:	2
TWP:	47N
RANGE:	17W
PM:	N.M.
COUNTY:	Montrose
WATERSHED:	San Miguel
DIVISION:	4
DOW CODE:	43480
USGS MAP:	Uravan 7.5" quad
USFS MAP:	

SUPPLEMENTAL DATA

TAPE WT:	0.0001	*** NOTE *** Leave TAPE WT and TENSION at defaults for data collected with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.006

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

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

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.2 miles upstream from confluence with San Miguel
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	2.51 cfs
CALCULATED FLOW (Qc)=	2.53 cfs
(Qm-Qc)/Qm * 100 =	-0.9 %
MEASURED WATERLINE (WLm)=	6.45 ft
CALCULATED WATERLINE (WLc)=	6.44 ft
(WLm-WLc)/WLm * 100 =	0.2 %
MAX MEASURED DEPTH (Dm)=	0.75 ft
MAX CALCULATED DEPTH (Dc)=	0.76 ft
(Dm-Dc)/Dm * 100	-1.9 %
MEAN VELOCITY=	0.41 ft/sec
MANNING'S N=	0.141
SLOPE=	0.006 ft/ft
.4 * Qm =	1 cfs
2.5 * Qm=	6.3 cfs

RECOMMENDED INSTREAM FLOW:

FLOW (CFS)	PERIOD
2.86	winter

RATIONALE FOR RECOMMENDATION:

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

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

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.2 miles upstream from confluence with San Miguel
XS NUMBER: 1

GL = lowest Grassline elevation corrected for sag
WL = Waterline corrected for variations in field measured water surface elevations and sag

STAGING TABLE

	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)
	4.55	33.6	1.57	2.65	52.8	35.39	100.00%	1.49	56.25	1.07
	5.44	25.41	1.05	1.76	26.57	27.01	76.30%	0.98	21.45	0.81
	5.49	24.84	1.02	1.71	25.31	26.42	74.70%	0.96	20.07	0.79
GL	5.54	24.26	0.99	1.66	24.09	25.84	73.00%	0.93	18.76	0.78
	5.59	23.69	0.97	1.61	22.89	25.25	71.40%	0.91	17.49	0.76
	5.64	23.11	0.94	1.56	21.72	24.67	69.70%	0.88	16.28	0.75
	5.69	22.54	0.91	1.51	20.58	24.09	68.10%	0.85	15.12	0.73
	5.74	21.93	0.89	1.46	19.46	23.47	66.30%	0.83	14.02	0.72
	5.79	21.45	0.86	1.41	18.38	22.98	64.90%	0.8	12.92	0.7
	5.84	21.04	0.82	1.36	17.32	22.56	63.70%	0.77	11.85	0.68
	5.89	20.63	0.79	1.31	16.28	22.13	62.50%	0.74	10.82	0.66
	5.94	20.22	0.75	1.26	15.26	21.71	61.30%	0.7	9.84	0.64
	5.99	19.81	0.72	1.21	14.26	21.29	60.10%	0.67	8.9	0.62
	6.04	19.39	0.68	1.16	13.28	20.86	58.90%	0.64	8.01	0.6
	6.09	18.98	0.65	1.11	12.32	20.44	57.70%	0.6	7.17	0.58
	6.14	18.57	0.61	1.06	11.38	20.01	56.50%	0.57	6.37	0.56
	6.19	18.16	0.58	1.01	10.46	19.59	55.40%	0.53	5.62	0.54
	6.24	17.75	0.54	0.96	9.56	19.16	54.20%	0.5	4.91	0.51
	6.29	17.34	0.5	0.91	8.68	18.74	53.00%	0.46	4.24	0.49
	6.34	16.92	0.46	0.86	7.83	18.32	51.80%	0.43	3.62	0.46
	6.39	16.51	0.42	0.81	6.99	17.89	50.60%	0.39	3.05	0.44
	6.44	15.97	0.39	0.76	6.18	17.34	49.00%	0.36	2.53	0.41
	6.49	15.31	0.35	0.71	5.4	16.64	47.00%	0.32	2.08	0.39
	6.54	14.64	0.32	0.66	4.65	15.89	44.90%	0.29	1.67	0.36
WL	6.59	13.95	0.28	0.61	3.93	15.11	42.70%	0.26	1.31	0.33
	6.64	12.42	0.26	0.56	3.28	13.47	38.10%	0.24	1.04	0.32
	6.69	11.58	0.23	0.51	2.68	12.5	35.30%	0.21	0.78	0.29
	6.74	10.6	0.2	0.46	2.12	11.41	32.20%	0.19	0.56	0.27
	6.79	8.65	0.19	0.41	1.63	9.32	26.30%	0.18	0.42	0.26
	6.84	6.98	0.18	0.36	1.26	7.52	21.20%	0.17	0.31	0.25
	6.89	6.26	0.15	0.31	0.93	6.67	18.80%	0.14	0.2	0.22
	6.94	5.53	0.11	0.26	0.63	5.82	16.40%	0.11	0.12	0.19
	6.99	3.86	0.11	0.21	0.41	4.04	11.40%	0.1	0.07	0.18
	7.04	3.31	0.07	0.16	0.23	3.43	9.70%	0.07	0.03	0.13
	7.09	1.88	0.05	0.11	0.1	1.95	5.50%	0.05	0.01	0.11
	7.14	1.19	0.02	0.06	0.03	1.22	3.50%	0.02	0	0.07
	7.19	0.15	0.01	0.01	0	0.16	0.40%	0.01	0	0.03

Criteria

Range: 1 – 6.3 cfs

1) $0.24 \cdot \bar{d}$ = 0.87 cfs

2) 50% WP = 2.86 cfs

3) 1 ft/sec $\bar{V}$ = 46.88 cfs

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.2 miles upstream from confluence with San Miguel
XS NUMBER: 1

INPUT DATA # DATA POINTS= 34 VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
S & G	1	4.55	0	0	0	0	0	0	0.00%
	5	5.35	0	0	0	0	0	0	0.00%
	8	5.75	0	0	0	0	0	0	0.00%
W	10.2	6.43	0	0	0	0	0	0	0.00%
	11	6.7	0.2	0.03	0.84	0.2	0.18	0.01	0.20%
	12	6.8	0.4	0.54	1	0.4	0.3	0.16	6.50%
	12.5	6.75	0.35	0.8	0.5	0.35	0.18	0.14	5.60%
	13	6.95	0.55	0.08	0.54	0.55	0.28	0.02	0.90%
	13.5	7.05	0.65	0.14	0.51	0.65	0.33	0.05	1.80%
	14	7.1	0.65	0.63	0.5	0.65	0.33	0.2	8.20%
	14.5	7.05	0.5	1.15	0.5	0.5	0.25	0.29	11.40%
R	15	7.05	0.6	0	0.5	0.6	0.3	0	0.00%
	15.5	6.9	0.5	0.27	0.52	0.5	0.25	0.07	2.70%
	16	6.75	0.2	0.58	0.52	0.2	0.1	0.06	2.30%
	16.5	6.6	0.25	0.7	0.52	0.25	0.13	0.09	3.50%
	17	6.6	0.25	0.52	0.5	0.25	0.13	0.07	2.60%
	17.5	6.65	0.3	0.58	0.5	0.3	0.15	0.09	3.50%
	18	7.1	0.7	0.64	0.67	0.7	0.35	0.22	8.90%
	18.5	7.15	0.7	0.32	0.5	0.7	0.35	0.11	4.50%
	19	7.15	0.7	0.28	0.5	0.7	0.35	0.1	3.90%
	19.5	7.2	0.75	0.64	0.5	0.75	0.38	0.24	9.60%
	20	6.5	0.1	0.98	0.86	0.1	0.05	0.05	2.00%
	20.5	7	0.55	0.46	0.71	0.55	0.28	0.13	5.00%
	21	6.75	0.3	0.36	0.56	0.3	0.15	0.05	2.20%
	21.5	6.8	0.4	0.64	0.5	0.4	0.2	0.13	5.10%
R	22	6.8	0.4	0.51	0.5	0.4	0.2	0.1	4.10%
	22.5	6.45	0	0	0.61	0	0	0	0.00%
	23	6.95	0.35	0.23	0.71	0.35	0.26	0.06	2.40%
	24	6.95	0.5	0.17	1	0.5	0.5	0.09	3.40%
	25	6.6	0.2	0	1.06	0.2	0.2	0	0.00%
	26	6.45	0.05	0	1.01	0.05	0.03	0	0.00%
W	26.4	6.42	0	0	0.4	0	0	0	0.00%
	30	5.7	0	0	0	0	0	0	0.00%
S & G	35	4.45	0	0	0	0	0	0	0.00%
TOTALS ----------					17.57	0.75 (Max.)	6.18	2.51	100.00%

Manning's n = 0.1411

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.2 miles upstream from confluence with San Miguel
XS NUMBER: 1

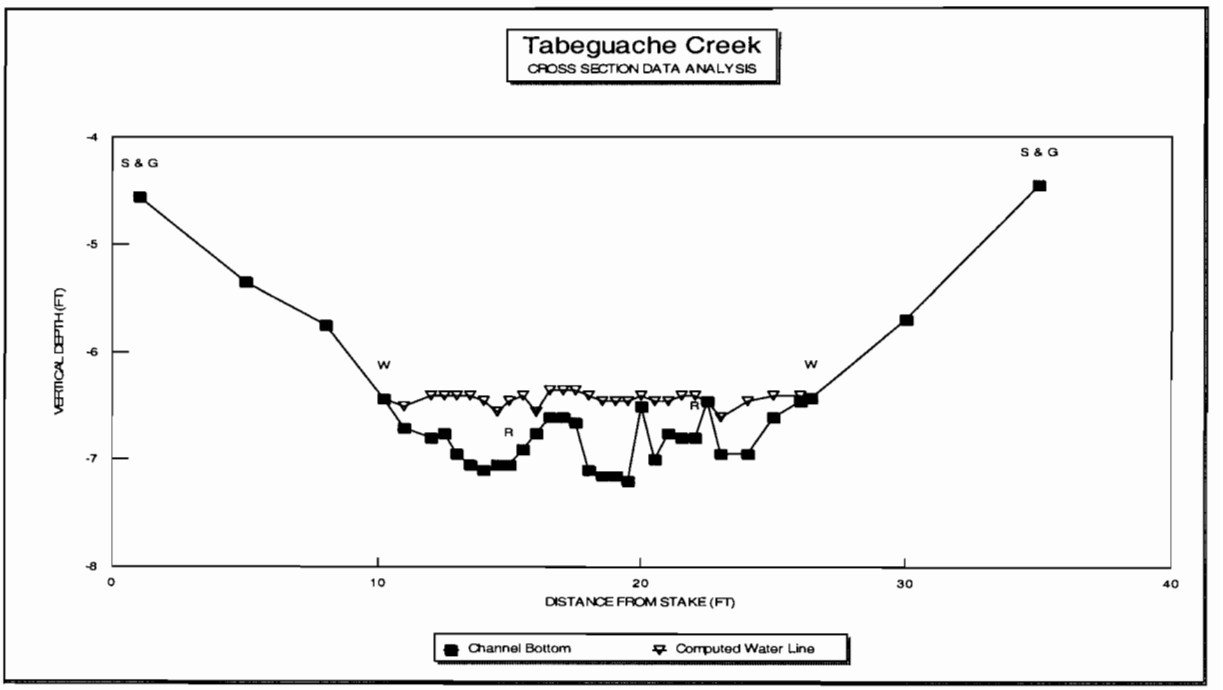
PROOF SHEET

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
6.2	6.18	10.21	65.20%
6.22	6.18	9.85	59.40%
6.24	6.18	9.49	53.60%
6.26	6.18	9.14	47.90%
6.28	6.18	8.79	42.30%
6.3	6.18	8.44	36.70%
6.32	6.18	8.1	31.10%
6.34	6.18	7.76	25.60%
6.36	6.18	7.42	20.20%
6.38	6.18	7.09	14.80%
6.4	6.18	6.76	9.40%
6.41	6.18	6.6	6.80%
6.42	6.18	6.43	4.20%
6.43	6.18	6.27	1.50%
6.44	6.18	6.11	-1.00%
6.45	6.18	5.96	-3.60%
6.46	6.18	5.8	-6.10%
6.47	6.18	5.64	-8.70%
6.48	6.18	5.49	-11.20%
6.49	6.18	5.34	-13.60%
6.5	6.18	5.18	-16.10%
6.52	6.18	4.88	-21.00%
6.54	6.18	4.59	-25.70%
6.56	6.18	4.3	-30.40%
6.58	6.18	4.02	-35.00%
6.6	6.18	3.74	-39.50%
6.62	6.18	3.48	-43.70%
6.64	6.18	3.23	-47.80%
6.66	6.18	2.98	-51.70%
6.68	6.18	2.75	-55.50%
6.7	6.18	2.52	-59.20%
	WATERLINE AT ZERO		
	AREA ERROR =		6.436

INPUT DATA # DATA POINTS= 34

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
S & G	1	4.55	0	0	0	0	0
	5	5.35	0	0	0	0	0
	8	5.75	0	0	0	0	0
W	10.2	6.43	0	0	0	0	0
	11	6.7	0.2	0.03	0.18	0.01	6.5
	12	6.8	0.4	0.54	0.3	0.16	6.4
	12.5	6.75	0.35	0.8	0.18	0.14	6.4
	13	6.95	0.55	0.08	0.28	0.02	6.4
	13.5	7.05	0.65	0.14	0.33	0.05	6.4
	14	7.1	0.65	0.63	0.33	0.2	6.45
	14.5	7.05	0.5	1.15	0.25	0.29	6.55
R	15	7.05	0.6	0	0.3	0	6.45
	15.5	6.9	0.5	0.27	0.25	0.07	6.4
	16	6.75	0.2	0.58	0.1	0.06	6.55
	16.5	6.6	0.25	0.7	0.13	0.09	6.35
	17	6.6	0.25	0.52	0.13	0.07	6.35
	17.5	6.65	0.3	0.58	0.15	0.09	6.35
	18	7.1	0.7	0.64	0.35	0.22	6.4
	18.5	7.15	0.7	0.32	0.35	0.11	6.45
	19	7.15	0.7	0.28	0.35	0.1	6.45
	19.5	7.2	0.75	0.64	0.38	0.24	6.45
	20	6.5	0.1	0.98	0.05	0.05	6.4
	20.5	7	0.55	0.46	0.28	0.13	6.45
	21	6.75	0.3	0.36	0.15	0.05	6.45
	21.5	6.8	0.4	0.64	0.2	0.13	6.4
R	22	6.8	0.4	0.51	0.2	0.1	6.4
	22.5	6.45	0	0	0	0	0
	23	6.95	0.35	0.23	0.26	0.06	6.6
	24	6.95	0.5	0.17	0.5	0.09	6.45
	25	6.6	0.2	0	0.2	0	6.4
	26	6.45	0.05	0	0.03	0	6.4
W	26.4	6.42	0	0	0	0	0
	30	5.7	0	0	0	0	0
S & G	35	4.45	0	0	0	0	0
				TOTALS	6.18	2.51	


Tabeguache Creek
CROSS SECTION DATA ANALYSIS
S & G
S & G
W
W
R
R
VERTICAL DEPTH (FT)
-4
-5
-6
-7
-8
0
10
20
30
40
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

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

LOCATION INFORMATION

STREAM NAME:	Tabeguache Creek
XS LOCATION:	approximately 0.3 miles upstream from confluence with San Miguel
XS NUMBER:	2
DATE:	6/19/03
OBSERVERS:	Skinner, Smith and Murphy
1/4 SEC:	NE
SECTION:	2
TWP:	47N
RANGE:	17W
PM:	N.M.
COUNTY:	Montrose
WATERSHED:	San Miguel
DIVISION:	4
DOW CODE:	43480
USGS MAP:	Uravan 7.5"quad
USFS MAP:	

SUPPLEMENTAL DATA

TAPE WT:	0.0001	*** NOTE *** Leave TAPE WT and TENSION at defaults for data collected with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.0055

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

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

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.3 miles upstream from confluence with San Miguel
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	2.13 cfs
CALCULATED FLOW (Qc)=	2.15 cfs
(Qm-Qc)/Qm * 100 =	-1 %
MEASURED WATERLINE (WLm)=	5.89 ft
CALCULATED WATERLINE (WLc)=	5.95 ft
(WLm-WLc)/WLm * 100 =	-1.2 %
MAX MEASURED DEPTH (Dm)=	0.55 ft
MAX CALCULATED DEPTH (Dc)=	0.6 ft
(Dm-Dc)/Dm * 100	-8.4 %
MEAN VELOCITY=	0.38 ft/sec
MANNING'S N=	0.134
SLOPE=	0.0055 ft/ft
.4 * Qm =	0.9 cfs
2.5 * Qm=	5.3 cfs

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

FLOW (CFS)	PERIOD
1.8	winter

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

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

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

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.3 miles upstream from confluence with San Miguel
XS NUMBER: 2

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	4.5	30.25	1.33	2.05	40.13	31.86	100.00%	1.26	38.52	0.96
	4.95	25.93	1.06	1.6	27.38	27.42	86.10%	1	22.52	0.82
	5	25.45	1.03	1.55	26.09	26.93	84.50%	0.97	21.04	0.81
	5.05	24.98	0.99	1.5	24.83	26.44	83.00%	0.94	19.61	0.79
	5.1	24.5	0.96	1.45	23.6	25.95	81.40%	0.91	18.23	0.77
	5.15	24.03	0.93	1.4	22.38	25.46	79.90%	0.88	16.91	0.76
	5.2	23.55	0.9	1.35	21.19	24.97	78.40%	0.85	15.64	0.74
	5.25	23.08	0.87	1.3	20.03	24.48	76.80%	0.82	14.42	0.72
	5.3	22.6	0.84	1.25	18.89	23.99	75.30%	0.79	13.26	0.7
	5.35	22.13	0.8	1.2	17.77	23.5	73.80%	0.76	12.14	0.68
	5.4	21.67	0.77	1.15	16.67	23.03	72.30%	0.72	11.07	0.66
	5.45	21.44	0.73	1.1	15.6	22.78	71.50%	0.68	9.97	0.64
	5.5	21.2	0.69	1.05	14.53	22.52	70.70%	0.65	8.93	0.61
	5.55	20.97	0.64	1	13.48	22.27	69.90%	0.61	7.94	0.59
	5.6	20.74	0.6	0.95	12.43	22.02	69.10%	0.56	6.99	0.56
	5.65	20.51	0.56	0.9	11.4	21.76	68.30%	0.52	6.1	0.53
	5.7	20.27	0.51	0.85	10.38	21.51	67.50%	0.48	5.26	0.51
	5.75	20.01	0.47	0.8	9.37	21.22	66.60%	0.44	4.48	0.48
	5.8	19.39	0.43	0.75	8.39	20.57	64.50%	0.41	3.8	0.45
	5.85	18.26	0.41	0.7	7.44	19.41	60.90%	0.38	3.23	0.43
	5.9	17.66	0.37	0.65	6.54	18.77	58.90%	0.35	2.67	0.41
WL	5.95	17.05	0.33	0.6	5.67	18.13	56.90%	0.31	2.15	0.38
	6	16.57	0.29	0.55	4.83	17.62	55.30%	0.27	1.68	0.35
	6.05	15.23	0.26	0.5	4.03	16.23	50.90%	0.25	1.31	0.33
	6.1	13.79	0.24	0.45	3.3	14.72	46.20%	0.22	1	0.3
	6.15	12.93	0.2	0.4	2.63	13.78	43.20%	0.19	0.72	0.27
	6.2	12.35	0.16	0.35	2	13.1	41.10%	0.15	0.47	0.24
	6.25	10.72	0.13	0.3	1.42	11.37	35.70%	0.13	0.29	0.21
	6.3	8.7	0.11	0.25	0.93	9.22	28.90%	0.1	0.17	0.18
	6.35	6.8	0.08	0.2	0.54	7.16	22.50%	0.08	0.08	0.15
	6.4	4.42	0.06	0.15	0.25	4.63	14.50%	0.05	0.03	0.12
	6.45	2.29	0.03	0.1	0.07	2.39	7.50%	0.03	0.01	0.08
	6.5	0.13	0.02	0.05	0	0.16	0.50%	0.02	0	0.06

Range: 0.9 – 5.3 cfs

1) $0.3' \bar{d}$ = 1.8 cfs

2) 50% WP = 1.25 cfs

3) 1 ft/sec = 38.52 cfs

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.3 miles upstream from confluence with San Miguel
XS NUMBER: 2

INPUT DATA # DATA POINTS= 35 VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
S & G	5	4.3	0	0	0	0	0	0	0.00%
	13	5.4	0	0	0	0	0	0	0.00%
W	14.4	5.98	0	0	0	0	0	0	0.00%
R	15	5.85	0	0	0	0	0	0	0.00%
R	15.5	5.85	0	0	0	0	0	0	0.00%
R	16	5.75	0	0	0	0	0	0	0.00%
	17	6.1	0.2	0.04	1.06	0.2	0.2	0.01	0.40%
	18	6.05	0.05	0	1	0.05	0.05	0	0.00%
	19	6.4	0.35	0.72	1.06	0.35	0.26	0.19	8.90%
	19.5	6.15	0.35	0.59	0.56	0.35	0.18	0.1	4.80%
	20	6.1	0.25	0.69	0.5	0.25	0.13	0.09	4.00%
	20.5	6.55	0.55	1.1	0.67	0.55	0.28	0.3	14.20%
	21	6.25	0.25	0.3	0.58	0.25	0.13	0.04	1.80%
	21.5	6.4	0.45	0.04	0.52	0.45	0.23	0.01	0.40%
	22	6.2	0.4	0.55	0.54	0.4	0.2	0.11	5.20%
	22.5	6.45	0.4	0.45	0.56	0.4	0.2	0.09	4.20%
	23	6.5	0.46	0.43	0.5	0.46	0.23	0.1	4.60%
	23.5	6.45	0.5	0.12	0.5	0.5	0.25	0.03	1.40%
	24	6.3	0.4	0.15	0.52	0.4	0.2	0.03	1.40%
	24.5	6.3	0.55	0.05	0.5	0.55	0.28	0.01	0.60%
	25	6.4	0.4	0.15	0.51	0.4	0.2	0.03	1.40%
	25.5	6.4	0.5	0.23	0.5	0.5	0.25	0.06	2.70%
	26	6.45	0.55	0.35	0.5	0.55	0.28	0.1	4.50%
	26.5	6.45	0.55	0.56	0.5	0.55	0.28	0.15	7.20%
	27	6.05	0.1	0.37	0.64	0.1	0.05	0.02	0.90%
	27.5	6.05	0.1	1.07	0.5	0.1	0.05	0.05	2.50%
	28	6	0.05	0	0.5	0.05	0.03	0	0.00%
	28.5	6.5	0.5	0.41	0.71	0.5	0.25	0.1	4.80%
	29	6.5	0.5	0.53	0.5	0.5	0.38	0.2	9.30%
	30	6.25	0.25	0.61	1.03	0.25	0.25	0.15	7.20%
	31	6.5	0.5	0.19	1.03	0.5	0.5	0.1	4.50%
	32	6.25	0.25	0.26	1.03	0.25	0.25	0.07	3.00%
	33	6.2	0.2	0	1	0.2	0.13	0	0.00%
W	33.3	6.02	0	0	0.35	0	0	0	0.00%
S & G	36.7	4.5	0	0	0	0	0	0	0.00%
TOTALS ----------					18.39	0.55 (Max.)	5.67	2.13	100.00%

Manning's n = 0.1339

STREAM NAME: Tabeguache Creek
XS LOCATION: approximately 0.3 miles upstream from confluence with San Miguel
XS NUMBER: 2

PROOF SHEET

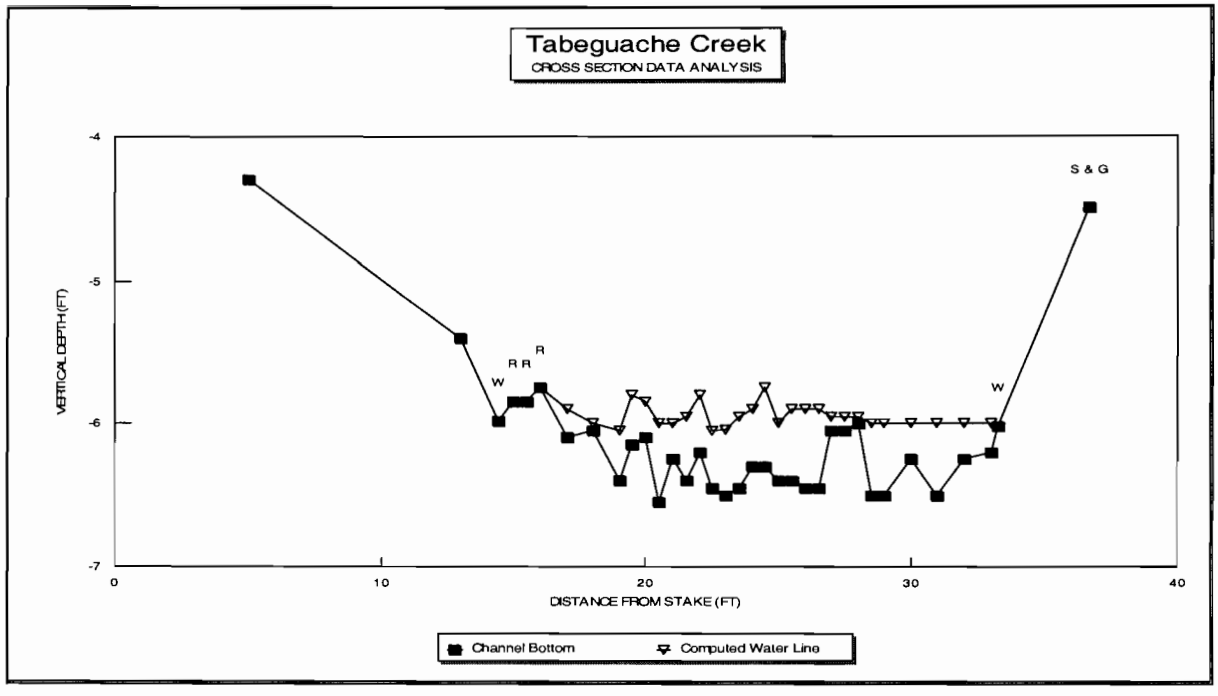
WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
5.64	5.67	11.79	107.80%
5.66	5.67	11.38	100.60%
5.68	5.67	10.97	93.40%
5.7	5.67	10.56	86.20%
5.72	5.67	10.16	79.10%
5.74	5.67	9.75	71.90%
5.76	5.67	9.35	64.90%
5.78	5.67	8.95	57.90%
5.8	5.67	8.56	50.90%
5.82	5.67	8.17	44.10%
5.84	5.67	7.79	37.40%
5.85	5.67	7.6	34.00%
5.86	5.67	7.42	30.80%
5.87	5.67	7.24	27.60%
5.88	5.67	7.06	24.40%
5.89	5.67	6.88	21.20%
5.9	5.67	6.7	18.10%
5.91	5.67	6.52	14.90%
5.92	5.67	6.34	11.80%
5.93	5.67	6.17	8.80%
5.94	5.67	6	5.70%
5.96	5.67	5.65	-0.30%
5.98	5.67	5.32	-6.30%
6	5.67	4.98	-12.20%
6.02	5.67	4.65	-18.00%
6.04	5.67	4.33	-23.70%
6.06	5.67	4.01	-29.30%
6.08	5.67	3.71	-34.60%
6.1	5.67	3.43	-39.60%
6.12	5.67	3.15	-44.50%
6.14	5.67	2.88	-49.20%

WATERLINE AT ZERO
AREA ERROR = 5.954

INPUT DATA # DATA POINTS= 35

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
S & G	5	4.3	0	0	0	0	0
	13	5.4	0	0	0	0	0
W	14.4	5.98	0	0	0	0	0
R	15	5.85	0	0	0	0	0
R	15.5	5.85	0	0	0	0	0
R	16	5.75	0	0	0	0	0
	17	6.1	0.2	0.04	0.2	0.01	5.9
	18	6.05	0.05	0	0.05	0	6
	19	6.4	0.35	0.72	0.26	0.19	6.05
	19.5	6.15	0.35	0.59	0.18	0.1	5.8
	20	6.1	0.25	0.69	0.13	0.09	5.85
	20.5	6.55	0.55	1.1	0.28	0.3	6
	21	6.25	0.25	0.3	0.13	0.04	6
	21.5	6.4	0.45	0.04	0.23	0.01	5.95
	22	6.2	0.4	0.55	0.2	0.11	5.8
	22.5	6.45	0.4	0.45	0.2	0.09	6.05
	23	6.5	0.46	0.43	0.23	0.1	6.04
	23.5	6.45	0.5	0.12	0.25	0.03	5.95
	24	6.3	0.4	0.15	0.2	0.03	5.9
	24.5	6.3	0.55	0.05	0.28	0.01	5.75
	25	6.4	0.4	0.15	0.2	0.03	6
	25.5	6.4	0.5	0.23	0.25	0.06	5.9
	26	6.45	0.55	0.35	0.28	0.1	5.9
	26.5	6.45	0.55	0.56	0.28	0.15	5.9
	27	6.05	0.1	0.37	0.05	0.02	5.95
	27.5	6.05	0.1	1.07	0.05	0.05	5.95
	28	6	0.05	0	0.03	0	5.95
	28.5	6.5	0.5	0.41	0.25	0.1	6
	29	6.5	0.5	0.53	0.38	0.2	6
	30	6.25	0.25	0.61	0.25	0.15	6
	31	6.5	0.5	0.19	0.5	0.1	6
	32	6.25	0.25	0.26	0.25	0.07	6
	33	6.2	0.2	0	0.13	0	6
W	33.3	6.02	0	0	0	0	0
S & G	36.7	4.5	0	0	0	0	0
				TOTALS	5.67	2.13	


Tabeguache Creek
CROSS SECTION DATA ANALYSIS
VERTICAL DEPTH (FT)
-4
-5
-6
-7
0
10
20
30
40
DISTANCE FROM STAKE (FT)
S & G
W
R R
R
W
Channel Bottom
Computed Water Line

Data Input & Proofing

STREAM NAME:	TABEGUACHE CREEK
XS LOCATION:	300 YARDS UPSTREAM FROM TEMPLETON HEA
XS NUMBER:	1
DATE:	6/2/06
OBSERVERS:	R. SMITH, D. MURPHY
1/4 SEC:	NW NE
SECTION:	1
TWP:	47 N
RANGE:	16 W
PM:	N.M.
COUNTY:	MONTROSE
WATERSHED:	SAN MIGUEL
DIVISION:	4
DOW CODE:	43480
USGS MAP:	URAVAN AND NUCLA 7.5
USFS MAP:	
	Level and Rod Survey
TAPE WT:	0.0106 lbs / ft
TENSION:	99999 lbs
SLOPE:	0.01 ft / ft

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

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

Total Data Points = 28

GL=1	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	Tape to Water
	S	0	2.06			0.00	0.00	0.00
1	GL	2	3.18			0.00	0.00	0.00
		4	3.71			0.00	0.00	0.00
	W	5.7	4.18	0.00	0.00	0.00	0.00	0.00
		6	4.39	0.20	0.00	0.13	0.00	4.19
		7	4.44	0.25	0.28	0.25	0.07	4.19
		8	4.38	0.20	0.84	0.20	0.17	4.18
		9	4.56	0.40	1.73	0.40	0.69	4.16
		10	4.79	0.60	2.24	0.45	1.01	4.19
		10.5	4.66	0.50	2.81	0.25	0.70	4.16
		11	4.57	0.40	1.58	0.20	0.32	4.17
		11.5	4.68	0.50	1.76	0.25	0.44	4.18
		12	4.63	0.45	2.34	0.23	0.53	4.18
		12.5	4.63	0.45	2.47	0.23	0.56	4.18
		13	4.74	0.55	2.56	0.28	0.70	4.19
		13.5	4.71	0.50	2.43	0.25	0.61	4.21
		14	4.57	0.40	1.73	0.30	0.52	4.17
		15	4.57	0.40	1.69	0.40	0.68	4.17
		16	4.51	0.35	1.34	0.35	0.47	4.16
		17	4.52	0.35	0.10	0.35	0.04	4.17
		18	4.39	0.20	1.10	0.20	0.22	4.19
		19	4.38	0.20	0.80	0.20	0.16	4.18
		20.00	4.33	0.15	0.65	0.15	0.10	4.18
		21.00	4.57	0.40	0.38	0.34	0.13	4.17
	W	21.70	4.18	0.00	0.00	0.00	0.00	0.00
		23.00	3.74			0.00	0.00	0.00
1	GL	24.00	2.86			0.00	0.00	0.00
	S	26.00	1.56			0.00	0.00	0.00
					Totals	5.40	8.10	

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

LOCATION INFORMATION

STREAM NAME:	TABEGUACHE CREEK
XS LOCATION:	300 YARDS UPSTREAM FROM TEMPLETON HEADGATE
XS NUMBER:	1
DATE:	2-Jun-06
OBSERVERS:	R. SMITH, D. MURPHY
1/4 SEC:	NW NE
SECTION:	1
TWP:	47 N
RANGE:	16 W
PM:	N.M.
COUNTY:	MONTROSE
WATERSHED:	SAN MIGUEL
DIVISION:	4
DOW CODE:	43480
USGS MAP:	URAVAN AND NUCLA 7.5
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0106	with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.01

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

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

STREAM NAME: TABEGUACHE CREEK
XS LOCATION: 300 YARDS UPSTREAM FROM TEMPLETON HEADGATE
XS NUMBER: 1

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
	S	0.00	2.06			0.00		0.00	0.00	0.0%
1	GL	2.00	3.18			0.00		0.00	0.00	0.0%
		4.00	3.71			0.00		0.00	0.00	0.0%
	W	5.70	4.18	0.00	0.00	0.00		0.00	0.00	0.0%
		6.00	4.39	0.20	0.00	0.37	0.20	0.13	0.00	0.0%
		7.00	4.44	0.25	0.28	1.00	0.25	0.25	0.07	0.9%
		8.00	4.38	0.20	0.84	1.00	0.20	0.20	0.17	2.1%
		9.00	4.56	0.40	1.73	1.02	0.40	0.40	0.69	8.5%
		10.00	4.79	0.60	2.24	1.03	0.60	0.45	1.01	12.5%
		10.50	4.66	0.50	2.81	0.52	0.50	0.25	0.70	8.7%
		11.00	4.57	0.40	1.58	0.51	0.40	0.20	0.32	3.9%
		11.50	4.68	0.50	1.76	0.51	0.50	0.25	0.44	5.4%
		12.00	4.63	0.45	2.34	0.50	0.45	0.23	0.53	6.5%
		12.50	4.63	0.45	2.47	0.50	0.45	0.23	0.56	6.9%
		13.00	4.74	0.55	2.56	0.51	0.55	0.28	0.70	8.7%
		13.50	4.71	0.50	2.43	0.50	0.50	0.25	0.61	7.5%
		14.00	4.57	0.40	1.73	0.52	0.40	0.30	0.52	6.4%
		15.00	4.57	0.40	1.69	1.00	0.40	0.40	0.68	8.3%
		16.00	4.51	0.35	1.34	1.00	0.35	0.35	0.47	5.8%
		17.00	4.52	0.35	0.10	1.00	0.35	0.35	0.04	0.4%
		18.00	4.39	0.20	1.10	1.01	0.20	0.20	0.22	2.7%
		19.00	4.38	0.20	0.80	1.00	0.20	0.20	0.16	2.0%
		20.00	4.33	0.15	0.65	1.00	0.15	0.15	0.10	1.2%
		21.00	4.57	0.40	0.38	1.03	0.40	0.34	0.13	1.6%
	W	21.70	4.18	0.00	0.00	0.80		0.00	0.00	0.0%
		23.00	3.74			0.00		0.00	0.00	0.0%
1	GL	24.00	2.86			0.00		0.00	0.00	0.0%
	S	26.00	1.56			0.00		0.00	0.00	0.0%
	TOTALS ----------					16.32	0.6 (Max.)	5.40	8.10	100.0%

Manning's n = 0.0473
Hydraulic Radius= 0.330497183

STREAM NAME: TABEGUACHE CREEK
XS LOCATION: 300 YARDS UPSTREAM FROM TEMPLETON HEADGATE
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	5.40	5.36	-0.7%
3.93	5.40	9.56	77.3%
3.95	5.40	9.21	70.7%
3.97	5.40	8.86	64.3%
3.99	5.40	8.52	57.9%
4.01	5.40	8.17	51.5%
4.03	5.40	7.83	45.2%
4.05	5.40	7.49	38.9%
4.07	5.40	7.16	32.7%
4.09	5.40	6.82	26.5%
4.11	5.40	6.49	20.4%
4.13	5.40	6.17	14.3%
4.14	5.40	6.00	11.3%
4.15	5.40	5.84	8.3%
4.16	5.40	5.68	5.3%
4.17	5.40	5.52	2.3%
4.18	5.40	5.36	-0.7%
4.19	5.40	5.20	-3.6%
4.20	5.40	5.04	-6.6%
4.21	5.40	4.88	-9.6%
4.22	5.40	4.72	-12.5%
4.23	5.40	4.56	-15.4%
4.25	5.40	4.25	-21.3%
4.27	5.40	3.93	-27.1%
4.29	5.40	3.62	-32.9%
4.31	5.40	3.31	-38.7%
4.33	5.40	2.99	-44.5%
4.35	5.40	2.69	-50.1%
4.37	5.40	2.40	-55.6%
4.39	5.40	2.12	-60.7%
4.41	5.40	1.87	-65.3%
4.43	5.40	1.65	-69.4%

WATERLINE AT ZERO
AREA ERROR = 4.178

STREAM NAME: TABEGUACHE CREEK
XS LOCATION: 300 YARDS UPSTREAM FROM TEMPLETON HEADGATE
XS NUMBER: 1

Constant Manning's n

GL = lowest Grassline elevation corrected for sag
WL = Waterline corrected for variations in field measured water surface elevations and sag

STAGING TABLE

	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	3.18	21.64	1.13	1.61	24.38	22.38	100.0%	1.09	81.05	3.32
	3.23	21.40	1.09	1.56	23.35	22.12	98.8%	1.06	76.03	3.26
	3.28	21.16	1.05	1.51	22.29	21.85	97.6%	1.02	70.92	3.18
	3.33	20.91	1.02	1.46	21.24	21.58	96.4%	0.98	65.98	3.11
	3.38	20.67	0.98	1.41	20.20	21.31	95.2%	0.95	61.20	3.03
	3.43	20.42	0.94	1.36	19.17	21.03	94.0%	0.91	56.58	2.95
	3.48	20.17	0.90	1.31	18.16	20.76	92.8%	0.87	52.13	2.87
	3.53	19.93	0.86	1.26	17.15	20.49	91.6%	0.84	47.83	2.79
	3.58	19.68	0.82	1.21	16.16	20.22	90.4%	0.80	43.71	2.70
	3.63	19.44	0.78	1.16	15.19	19.95	89.2%	0.76	39.74	2.62
	3.68	19.19	0.74	1.11	14.22	19.68	88.0%	0.72	35.95	2.53
	3.73	18.95	0.70	1.06	13.27	19.41	86.8%	0.68	32.32	2.44
	3.78	18.64	0.66	1.01	12.33	19.09	85.3%	0.65	28.91	2.35
	3.83	18.32	0.62	0.96	11.40	18.74	83.8%	0.61	25.70	2.25
	3.88	17.99	0.58	0.91	10.50	18.40	82.2%	0.57	22.66	2.16
	3.93	17.66	0.54	0.86	9.60	18.06	80.7%	0.53	19.79	2.06
	3.98	17.33	0.50	0.81	8.73	17.71	79.2%	0.49	17.10	1.96
	4.03	17.00	0.46	0.76	7.87	17.37	77.6%	0.45	14.58	1.85
	4.08	16.67	0.42	0.71	7.03	17.03	76.1%	0.41	12.23	1.74
	4.13	16.34	0.38	0.66	6.20	16.68	74.6%	0.37	10.07	1.62
WL	4.18	16.02	0.34	0.61	5.39	16.34	73.0%	0.33	8.09	1.50
	4.23	15.85	0.29	0.56	4.60	16.14	72.1%	0.28	6.25	1.36
	4.28	15.69	0.24	0.51	3.81	15.95	71.3%	0.24	4.60	1.21
	4.33	15.52	0.20	0.46	3.03	15.76	70.4%	0.19	3.17	1.05
	4.38	14.21	0.16	0.41	2.29	14.41	64.4%	0.16	2.10	0.92
	4.43	10.74	0.16	0.36	1.67	10.92	48.8%	0.15	1.50	0.90
	4.48	9.33	0.13	0.31	1.18	9.48	42.4%	0.12	0.92	0.78
	4.53	7.14	0.11	0.26	0.75	7.25	32.4%	0.10	0.52	0.69
	4.58	4.82	0.09	0.21	0.44	4.91	21.9%	0.09	0.27	0.63
	4.63	3.92	0.06	0.16	0.22	3.99	17.8%	0.05	0.10	0.45
	4.68	1.85	0.05	0.11	0.09	1.89	8.5%	0.05	0.03	0.40
	4.73	0.77	0.02	0.06	0.02	0.79	3.5%	0.02	0.00	0.25
	4.78	0.10	0.01	0.01	0.00	0.10	0.5%	0.01	0.00	0.10

3 of 3 : 3.89 cfs

2 of 3 : out of range

STREAM NAME: TABEGUACHE CREEK
XS LOCATION: 300 YARDS UPSTREAM FROM TEMPLETON HEADGATE
XS NUMBER: 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	8.10	cfs
CALCULATED FLOW (Qc)=	8.09	cfs
(Qm-Qc)/Qm * 100 =	0.1	%
MEASURED WATERLINE (WLm)=	4.18	ft
CALCULATED WATERLINE (WLc)=	4.18	ft
(WLm-WLc)/WLm * 100 =	0.1	%
MAX MEASURED DEPTH (Dm)=	0.60	ft
MAX CALCULATED DEPTH (Dc)=	0.61	ft
(Dm-Dc)/Dm * 100	-2.1	%
MEAN VELOCITY=	1.50	ft/sec
MANNING'S N=	0.047	
SLOPE=	0.01	ft/ft
.4 * Qm =	3.2	cfs
2.5 * Qm=	20.2	cfs

RECOMMENDED INSTREAM FLOW:

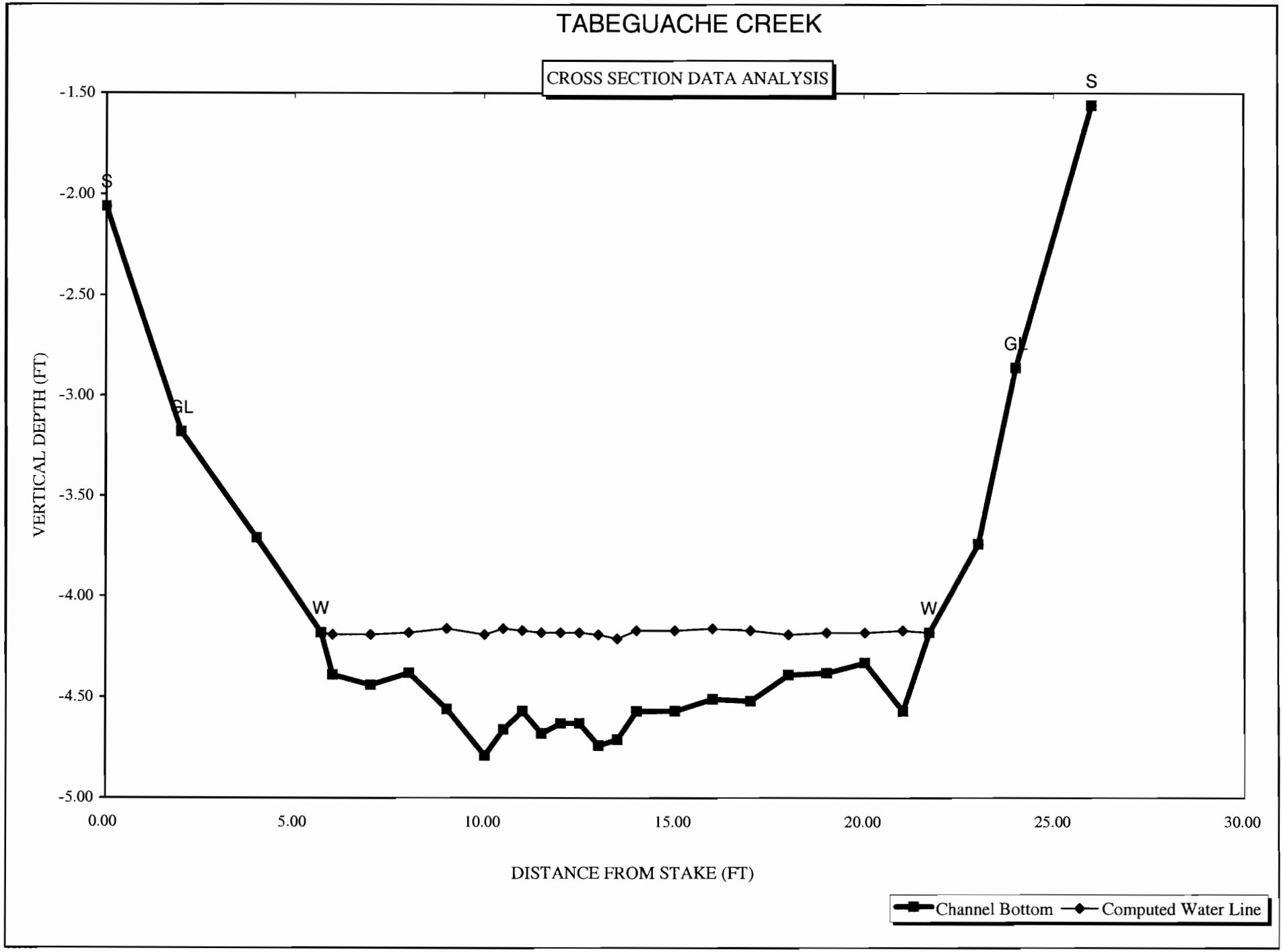
FLOW (CFS)	PERIOD

RATIONALE FOR RECOMMENDATION:

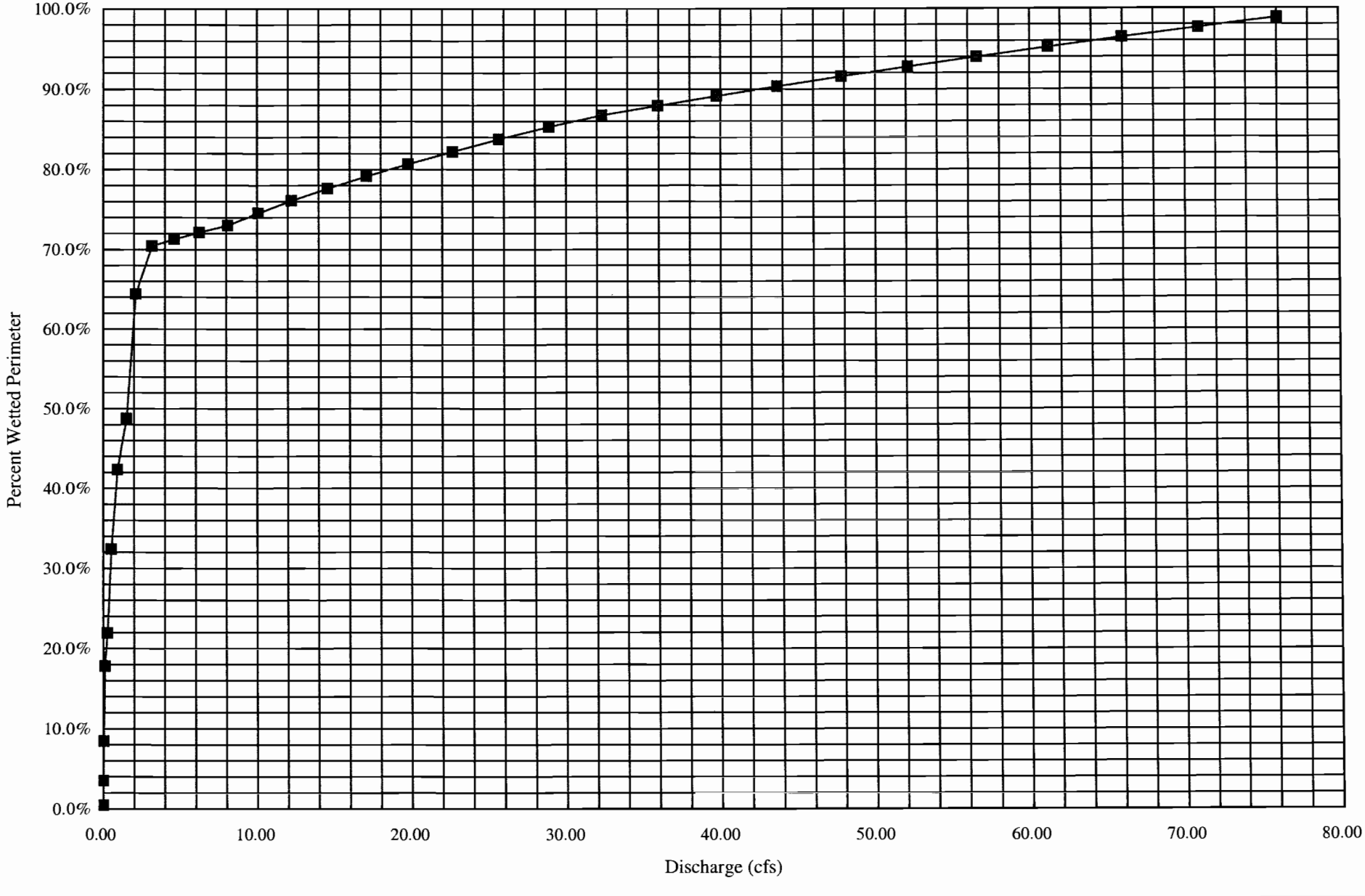
RECOMMENDATION BY: ..... AGENCY..... DATE:.....

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

TABEGUACHE CREEK



Percent Wetted Perimeter vs. Discharge



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

LOCATION INFORMATION

STREAM NAME:	Tabeguache Creek
XS LOCATION:	300 yds upstream from Templeton Ditch
XS NUMBER:	2
DATE:	2-Jun-06
OBSERVERS:	R. Smith, D. Murphy
1/4 SEC:	NE
SECTION:	1
TWP:	47N
RANGE:	16W
PM:	New Mexico
COUNTY:	Montrose
WATERSHED:	San Miguel
DIVISION:	4
DOW CODE:	43480
USGS MAP:	Uravan and Nucla 7.5
USFS MAP:	0

SUPPLEMENTAL DATA

		*** NOTE ***
		Leave TAPE WT and TENSION
		at defaults for data collected
TAPE WT:	0.0106	with a survey level and rod
TENSION:	99999	

CHANNEL PROFILE DATA

SLOPE:	0.00666

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

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

STREAM NAME: Tabeguache Creek
XS LOCATION: 300 yds upstream from Templeton Ditch
XS NUMBER: 2

DATA POINTS= 25

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL
	S	0.00	2.06		
1	G	3.50	4.01		
	W	4.50	4.75	0.00	0.00
		5.00	5.10	0.35	0.09
		6.00	5.14	0.30	1.21
		7.00	5.13	0.30	1.06
		8.00	5.27	0.50	1.30
		9.00	5.40	0.65	0.79
		10.00	5.19	0.45	1.57
		10.50	5.34	0.60	1.57
		11.00	5.42	0.65	1.29
		11.50	5.46	0.70	1.27
		12.00	5.32	0.55	1.90
		13.00	5.15	0.40	0.21
		14.00	5.40	0.65	1.53
		14.50	5.39	0.65	1.78
		15.00	5.22	0.45	1.61
		16.00	5.21	0.45	1.02
		17.00	5.06	0.25	1.22
		18.00	5.09	0.30	1.05
		19.00	5.20	0.40	0.92
		20.00	5.20	0.40	0.51
	W	20.70	4.80	0.00	0.00
1	G	22.00	4.01		
	S	26.00	2.16		

TOTALS ----------

VALUES COMPUTED FROM RAW FIELD DATA

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%
0.61	0.35	0.26	0.02	0.3%
1.00	0.30	0.30	0.36	4.5%
1.00	0.30	0.30	0.32	3.9%
1.01	0.50	0.50	0.65	8.0%
1.01	0.65	0.65	0.51	6.3%
1.02	0.45	0.34	0.53	6.6%
0.52	0.60	0.30	0.47	5.8%
0.51	0.65	0.33	0.42	5.2%
0.50	0.70	0.35	0.44	5.5%
0.52	0.55	0.41	0.78	9.7%
1.01	0.40	0.40	0.08	1.0%
1.03	0.65	0.49	0.75	9.2%
0.50	0.65	0.33	0.58	7.2%
0.53	0.45	0.34	0.54	6.7%
1.00	0.45	0.45	0.46	5.7%
1.01	0.25	0.25	0.31	3.8%
1.00	0.30	0.30	0.32	3.9%
1.01	0.40	0.40	0.37	4.5%
1.00	0.40	0.34	0.17	2.1%
0.81		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
0.00		0.00	0.00	0.0%
16.60	0.7 (Max.)	7.03	8.09	100.0%

Manning's n = 0.0594
Hydraulic Radius= 0.423396477

STREAM NAME: Tabeguache Creek
XS LOCATION: 300 yds upstream from Templeton Ditch
XS NUMBER: 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	7.03	7.06	0.5%
4.53	7.03	11.21	59.5%
4.55	7.03	10.87	54.7%
4.57	7.03	10.53	49.9%
4.59	7.03	10.20	45.1%
4.61	7.03	9.86	40.3%
4.63	7.03	9.53	35.6%
4.65	7.03	9.20	30.8%
4.67	7.03	8.86	26.1%
4.69	7.03	8.53	21.4%
4.71	7.03	8.20	16.8%
4.73	7.03	7.88	12.1%
4.74	7.03	7.71	9.8%
4.75	7.03	7.55	7.4%
4.76	7.03	7.39	5.1%
4.77	7.03	7.23	2.8%
4.78	7.03	7.06	0.5%
4.79	7.03	6.90	-1.8%
4.80	7.03	6.74	-4.1%
4.81	7.03	6.58	-6.4%
4.82	7.03	6.42	-8.7%
4.83	7.03	6.26	-11.0%
4.85	7.03	5.94	-15.5%
4.87	7.03	5.62	-20.1%
4.89	7.03	5.30	-24.6%
4.91	7.03	4.98	-29.1%
4.93	7.03	4.67	-33.6%
4.95	7.03	4.35	-38.0%
4.97	7.03	4.04	-42.5%
4.99	7.03	3.73	-46.9%
5.01	7.03	3.42	-51.3%
5.03	7.03	3.11	-55.7%

WATERLINE AT ZERO
AREA ERROR = 4.777

STREAM NAME: Tabeguache Creek
XS LOCATION: 300 yds upstream from Templeton Ditch
XS NUMBER: 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	4.01	18.50	1.10	1.45	20.34	19.36	100.0%	1.05	42.90	2.11
	4.03	18.45	1.09	1.43	20.02	19.30	99.7%	1.04	41.88	2.09
	4.08	18.30	1.04	1.38	19.10	19.12	98.7%	1.00	38.97	2.04
	4.13	18.15	1.00	1.33	18.19	18.94	97.8%	0.96	36.15	1.99
	4.18	18.00	0.96	1.28	17.29	18.76	96.9%	0.92	33.42	1.93
	4.23	17.85	0.92	1.23	16.39	18.58	96.0%	0.88	30.78	1.88
	4.28	17.70	0.88	1.18	15.50	18.40	95.0%	0.84	28.23	1.82
	4.33	17.55	0.83	1.13	14.62	18.22	94.1%	0.80	25.78	1.76
	4.38	17.40	0.79	1.08	13.75	18.04	93.2%	0.76	23.41	1.70
	4.43	17.25	0.75	1.03	12.88	17.86	92.2%	0.72	21.15	1.64
	4.48	17.10	0.70	0.98	12.02	17.68	91.3%	0.68	18.98	1.58
	4.53	16.95	0.66	0.93	11.17	17.50	90.4%	0.64	16.91	1.51
	4.58	16.80	0.61	0.88	10.33	17.32	89.4%	0.60	14.94	1.45
	4.63	16.65	0.57	0.83	9.49	17.14	88.5%	0.55	13.07	1.38
	4.68	16.50	0.52	0.78	8.66	16.96	87.6%	0.51	11.30	1.30
	4.73	16.35	0.48	0.73	7.84	16.78	86.6%	0.47	9.64	1.23
WL	4.78	16.20	0.43	0.68	7.03	16.59	85.7%	0.42	8.09	1.15
	4.83	16.04	0.39	0.63	6.22	16.41	84.7%	0.38	6.65	1.07
	4.88	15.88	0.34	0.58	5.42	16.22	83.8%	0.33	5.33	0.98
	4.93	15.72	0.29	0.53	4.63	16.03	82.8%	0.29	4.13	0.89
	4.98	15.57	0.25	0.48	3.85	15.84	81.8%	0.24	3.06	0.79
	5.03	15.41	0.20	0.43	3.08	15.66	80.9%	0.20	2.12	0.69
	5.08	14.56	0.16	0.38	2.32	14.78	76.3%	0.16	1.37	0.59
	5.13	12.67	0.13	0.33	1.63	12.86	66.4%	0.13	0.84	0.52
	5.18	9.87	0.11	0.28	1.09	10.03	51.8%	0.11	0.51	0.46
	5.23	6.22	0.11	0.23	0.68	6.35	32.8%	0.11	0.31	0.46
	5.28	4.81	0.08	0.18	0.40	4.91	25.3%	0.08	0.16	0.39
	5.33	3.40	0.06	0.13	0.20	3.46	17.9%	0.06	0.06	0.30
	5.38	1.98	0.03	0.08	0.06	2.00	10.3%	0.03	0.01	0.20
	5.43	0.53	0.02	0.03	0.01	0.53	2.8%	0.02	0.00	0.13

2 of 3 = out of range.
3 of 3 = 5.62 cfs

STREAM NAME: Tabeguache Creek
XS LOCATION: 300 yds upstream from Templeton Ditch
XS NUMBER: 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	8.09	cfs
CALCULATED FLOW (Qc)=	8.09	cfs
(Qm-Qc)/Qm * 100 =	0.0	%
MEASURED WATERLINE (WLm)=	4.78	ft
CALCULATED WATERLINE (WLc)=	4.78	ft
(WLm-WLc)/WLm * 100 =	0.0	%
MAX MEASURED DEPTH (Dm)=	0.70	ft
MAX CALCULATED DEPTH (Dc)=	0.68	ft
(Dm-Dc)/Dm * 100	2.5	%
MEAN VELOCITY=	1.15	ft/sec
MANNING'S N=	0.059	
SLOPE=	0.00666	ft/ft
.4 * Qm =	3.2	cfs
2.5 * Qm=	20.2	cfs

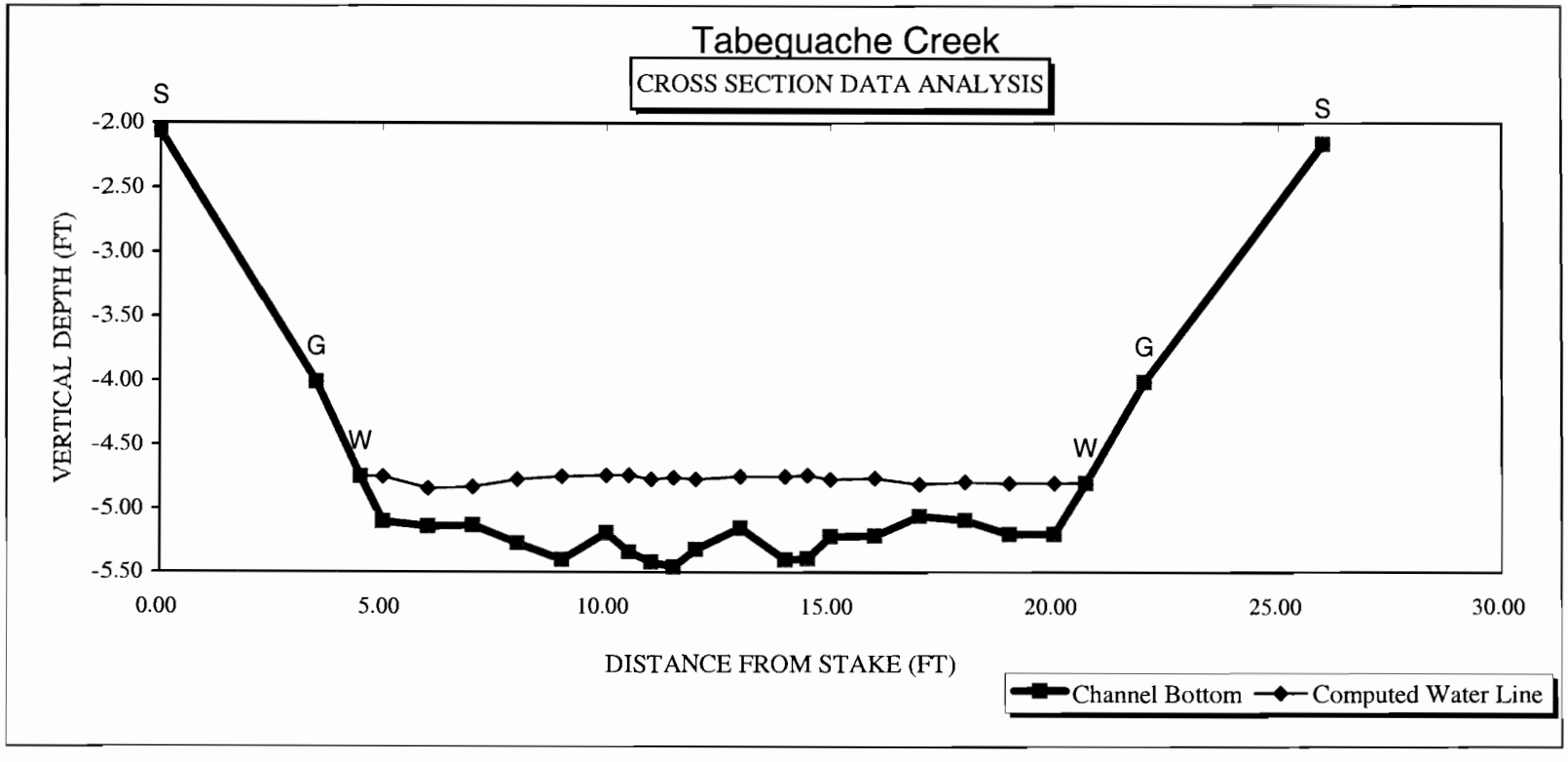
RECOMMENDED INSTREAM FLOW:

FLOW (CFS)	PERIOD

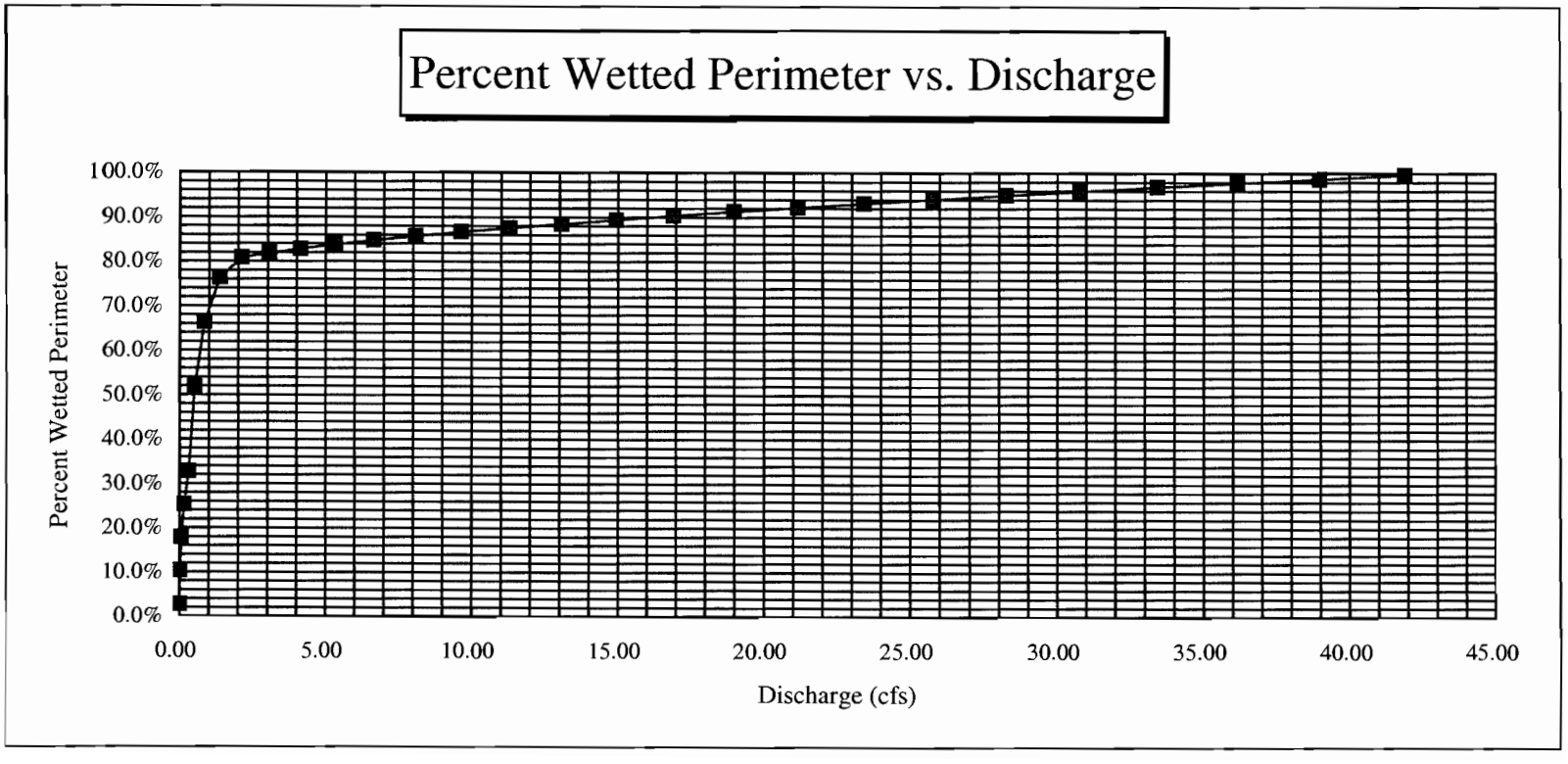
RATIONALE FOR RECOMMENDATION:

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

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



ChartMin	0	ChartMinY	-5.5
ChartMax	30	ChartMaxY	-2


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
30.00
35.00
40.00
45.00
Discharge (cfs)


1. 7. 2001


1.7.2001

1.6.2001