Stream: Cottonwood Creek

Executive Summary

Water Division: 4
Water District: 40
CDOW#: 39699
CWCB ID#: 06/04/A-003

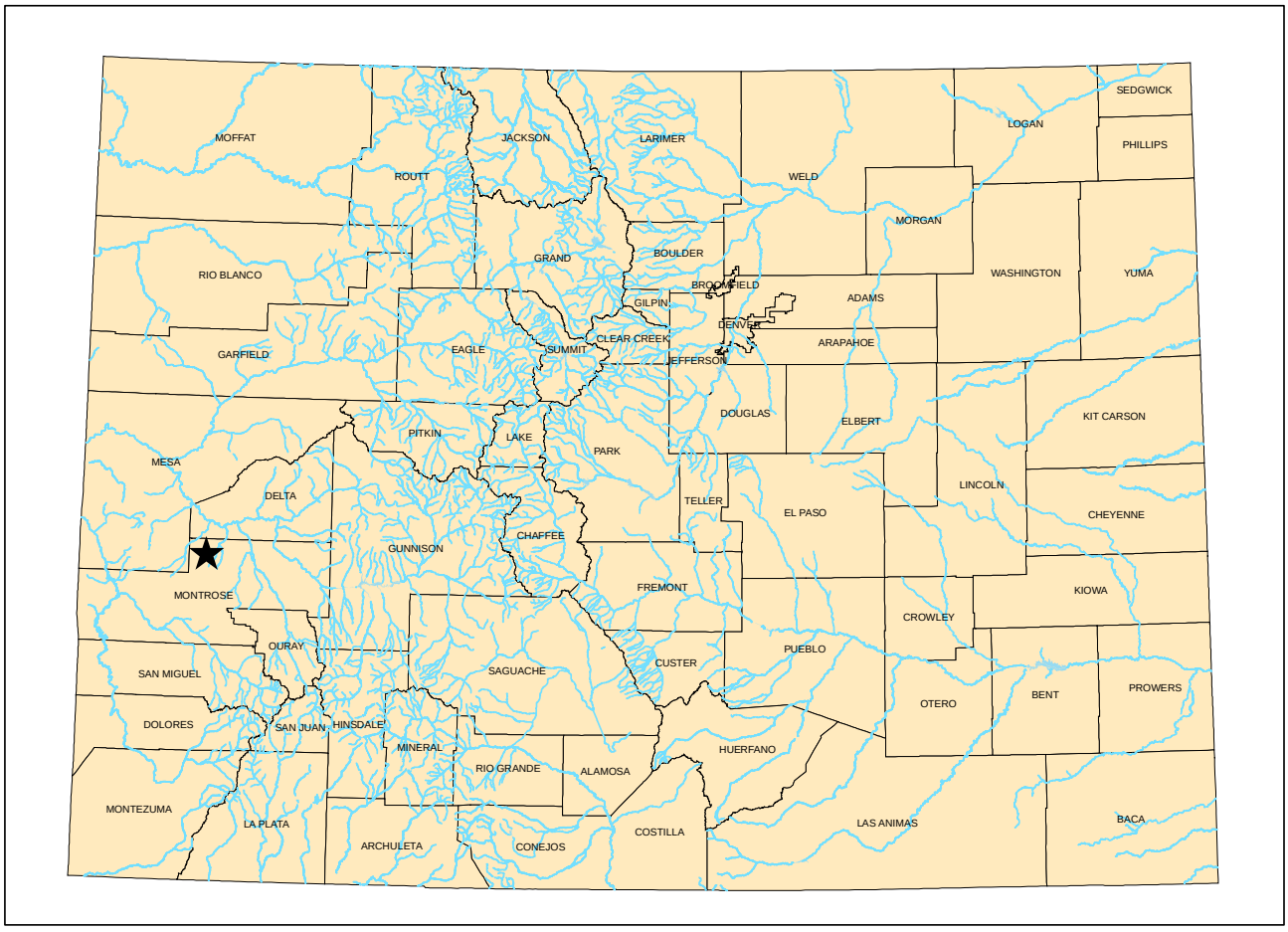
Segment: Headgate of Hawkins Ditch to Confluence with Roubideau Creek

Upper Terminus: Hawkins Ditch
Latitude: 38d30'40.56"N Longitude: 108d21'41.71"W
UTM North: 4267901.292 UTM East: 206884.483
SW1/4, NE1/4, Sctn18, T49N, R13W
2360 ft, W of the E Section Line, 2327 ft, S of the N Section Line

Lower Terminus: Roubideau Creek
Latitude: 38d42'53.3"N Longitude: 108d09'04.29"W
UTM North: 4289844.212 UTM East: 226010.492
NW1/4, SW1/4, Sctn34, T50N, R13W
1268 ft, E of the W Section Line, 1638 ft, N of the S Section Line

Counties: Montrose and Delta
Length: 20.62 miles
USGS Quad(s): Roubideau, Camel Back, Cottonwood Basin
ISF Appropriation: 3.6 cfs (April 1 – June 15)

Cottonwood Creek



Summary

The information contained in this report and the associated instream flow file folder forms the basis for staff's instream flow recommendation to be considered by the Board. It is staff's opinion that the information contained in this report is sufficient to support the findings required in Rule 5i.

Colorado's Instream Flow Program was created in 1973 when the Colorado State Legislature recognized "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3) C.R.S.). The statute vests the CWCB with the exclusive authority to appropriate and acquire instream flow and natural lake level water rights. In order to encourage other entities to participate in Colorado's Instream Flow Program, the statute directs the CWCB to request instream flow recommendations from other state and federal agencies. The Bureau of Land Management recommended these segments of Cottonwood Creek to the CWCB for inclusion into the Instream Flow Program. Cottonwood Creek is being considered for inclusion into the Instream Flow Program because it has a natural environment that can be preserved to a reasonable degree with an instream flow water right. The BLM is very interested in protecting stream flows because the lower portions of Cottonwood Creek provide important spring spawning habitat for sensitive species.

Cottonwood Creek Creek provides habitat for sensitive fish species that live in cool-water and warm-water habitats. These species are among three species (flannelmouth sucker, bluehead sucker, and roundtail chub) that are the focus of a multi-state, coordinated conservation effort. State wildlife agencies for all states located within the Colorado River basin have signed a range-wide conservation strategy with

the objective of preventing a listing of these species under the federal Endangered Species Act. Under this comprehensive strategy, each state will develop an individual conservation plan that contains specific, on-the-ground conservation objectives, including protection of flow through stream reaches that support the species. The Bureau of Land Management is a cooperating agency in this effort throughout the Colorado River basin. BLM Colorado intends to be a signatory to the Colorado plan that is under development by the Colorado Division of Wildlife.

Cottonwood Creek is 29.2 miles long. It begins at its headwaters on the northeastern flank of the Uncompahgre Plateau at an elevation of approximately 9,195 feet. It terminates at the confluence with Roubideau Creek at an elevation of approximately 4,955 feet. Approximately 93% of the 20.62-mile segment addressed by this report is located on BLM lands. Cottonwood Creek is located within Montrose and Delta Counties. The total drainage area of the creek is approximately 46.91 square miles. Cottonwood Creek generally flows in a northeasterly direction.

The segment addressed by this report begins at the Hawkins Ditch and extends downstream to the confluence with Roubideau Creek. The proposed segment is located west of the Town of Olathe. The staff has received one recommendation for this segment, from the BLM, which is discussed below.

Instream Flow Recommendation(s)

BLM recommended 3.6 cfs (April 1 to June 14) based on data collection efforts on March 25, 2004, and June 3, 1998. The modeling results from these survey efforts are within the confidence interval produced by the R2Cross model.

Land Status Review

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Hawkins Ditch	Confluence with Roubideau Creek	20.62	7%	93%

Biological Data

The BLM has conducted field surveys of the fishery resources on this stream and have found a natural environment that can be preserved. As reported in the letter from BLM to the CWCB "Cottonwood Creek Creek is a moderate to high gradient stream that changes from a cold water fishery to a cool-water fishery as it traverses BLM lands. In the upper reach, water supplies, water quality, food supplies and substrate are excellent for salmonids. In the lower reach, snowmelt runoff flows provide suitable spawning habitat for sensitive species that migrate up into the creek from the Gunnison River. Fishery surveys indicate that the upper reach supports a self-sustaining population of Colorado River Cutthroat trout with untested genetic purity. The lower reach provides spawning habitat for bluehead sucker and flannelmouth sucker, as well as providing habitat for speckled dace. (See BLM Fish Survey in Appendix B).

Field Survey Data

BLM staff used the R2Cross methodology to quantify the amount of water required to preserve the natural environment to a reasonable degree. The R2Cross method requires that stream discharge and channel profile data be collected in a riffle stream habitat type. Riffles are most easily visualized, as the stream habitat types that would dry up first should stream flow cease. This type of hydraulic data

collection consists of setting up a transect, surveying the stream channel geometry, and measuring the stream discharge. Appendix B contains copies of field data collected for this proposed segment.

Biological Flow Recommendation

The CWCB staff relied upon the biological expertise of the cooperating agencies to interpret output from the R2Cross data collected to develop the initial, biologic instream flow recommendation. This initial recommendation is designed to address the unique biologic requirements of each stream without regard to water availability. Three instream flow hydraulic parameters, average depth, percent wetted perimeter, and average velocity are used to develop biologic instream flow recommendations. The CDOW has determined that maintaining these three hydraulic parameters at adequate levels across riffle habitat types, aquatic habitat in pools and runs will also be maintained for most life stages of fish and aquatic invertebrates (Nehring 1979; Espegren 1996).

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

Table 1: Data for Lower Segment – Headgate of Hawkins Ditch to confluence with Roubideau Creek

Party	Date	Q	250%-40%	Summer (3/3)	Winter (2/3)
BLM	03/25/2004	1.18	2.9 – 0.5	(1)	1.9
BLM	06/03/1998	4.87	12.2 – 3.9	3.6	(1)

BLM = Bureau of Land Management DOW = Division of Wildlife
(1) Predicted flow outside of the accuracy range of Manning's Equation. ? = Criteria never met in R2CROSS Staging Table.

Biologic Flow Recommendation

The flow recommendation for the snowmelt runoff period is 3.6 cfs from April 1 to June 15. This recommendation meets 3 of 3 criteria and is within the accuracy range of the R2Cross model. It is our belief that recommendations that fall outside of the accuracy range of the model, over 250% of the measured discharge or under 40% of the measured discharge may not give an accurate estimate of the necessary instream flow required.

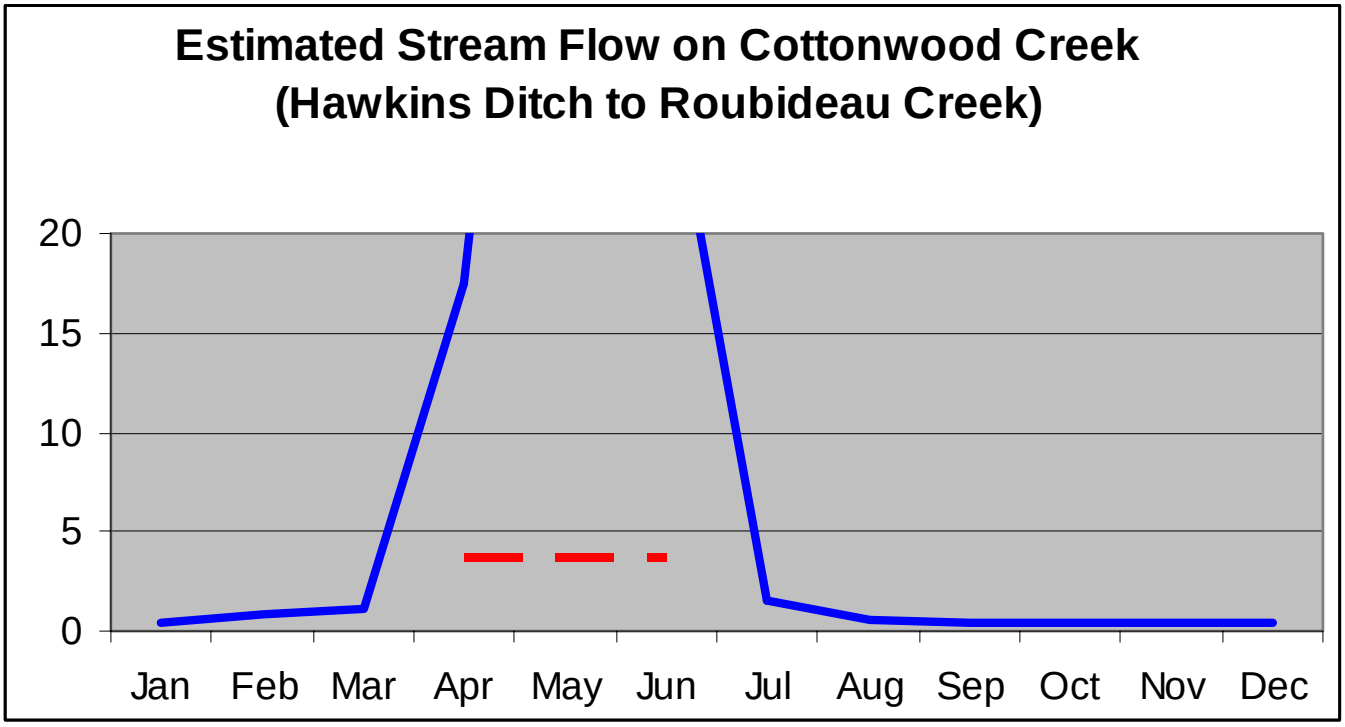
Hydrologic Data

After receiving the cooperating agency's biologic recommendation, the CWCB and BLM staff, conducted an evaluation of the stream hydrology to determine if water was physically available for an instream flow appropriation. Although there is a substantial amount of streamflow gage data available for the Uncompahgre Plateau and Glade Park, most of this data is severely impacted by diversions and irrigation use. This situation makes it difficult to estimate the natural flow regime for the watersheds on the Plateau. Without specific gage data to evaluate, the next best approach is a regional equation that estimates annual flow characteristics. The USGS has developed regional equations (Estimation of Natural Streamflow Characteristics in Western Colorado, Water Resources Investigations Report 85-4086, 1985) that apply to the Uncompahgre Plateau and Glade Park based on basin drainage area, mean annual precipitation, mean basin elevation and mean basin slope. The report "Uncompahgre Plateau and Glade Park Annual Hydrograph Estimation" in Appendix C, explains staff's water availability analysis in more detail. Table 2 below displays the estimated stream flow of Cottonwood Creek.

For the recommended reach, the synthetic hydrograph shows that the summer flow recommendation of 3.6 cfs (April 1 to June 14) is available. Analysis of water availability shows that the winter recommendation of 1.9 cfs is not available.

Table 2: Estimated Stream Flow on Cottonwood Creek (lower reach):

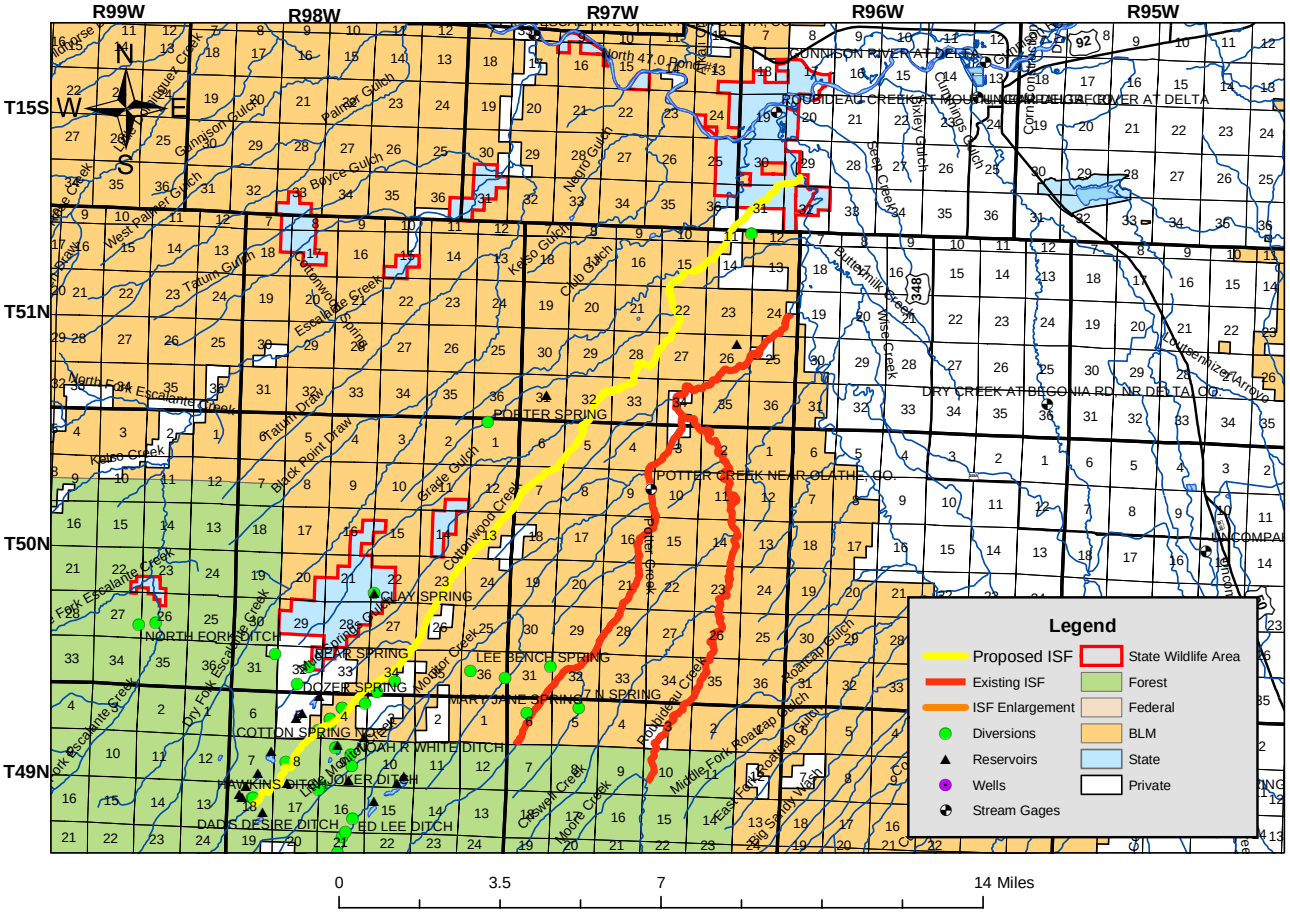
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(cfs)	0.37	0.80	1.15	17.46	63.68	29.22	1.49	0.57	0.48	0.45	0.44	0.40



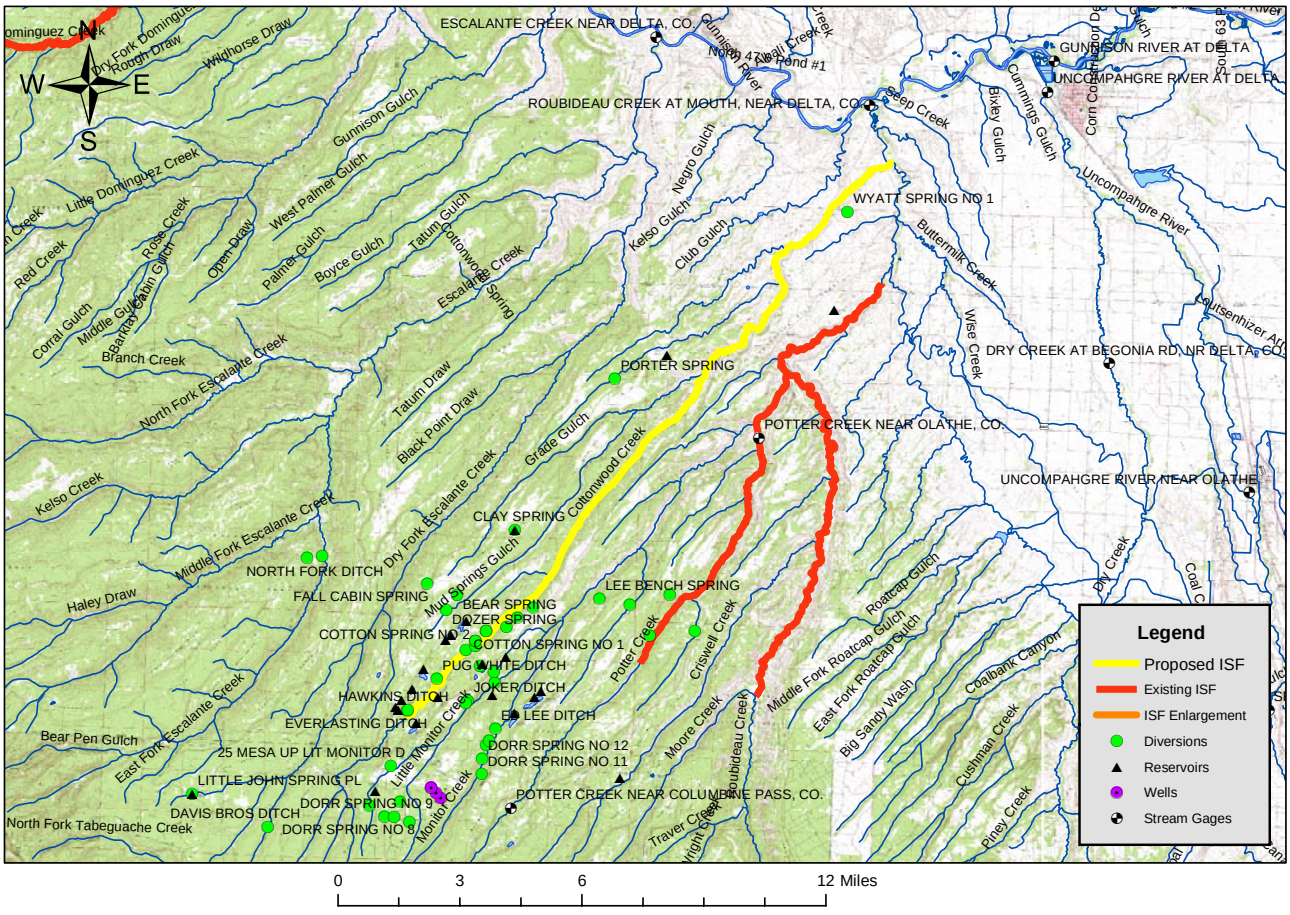
Existing Water Right Information

Staff has analyzed the water rights tabulation and consulted with the Division Engineer Office (DEO) to identify any potential water availability problems. There are three decreed surface diversion within this reach of stream, Hawkins Ditch, Long Park Ditch Headgate No. 1, and Long Park Ditch No. 5. Based on this analysis staff has determined that water is available for appropriation on Cottonwood Creek, from the headgate of the Hawkins Ditch to the confluence of Roubideau Creek, to preserve the natural environment to a reasonable degree without limiting or foreclosing the exercise of valid existing water rights.

Cottonwood Creek 2



Cottonwood Creek 2



CWCB Staff's Instream Flow Recommendation
Staff recommends the Board form its intent to appropriate on the following stream reach:

Stream: Cottonwood Creek

Segment: Hawkins Ditch to Confluence with Roubideau Creek

Upper Terminus: Hawkins Ditch
Latitude: 38d30'40.56"N Longitude: 108d21'41.71"W
UTM North: 4267901.292 UTM East: 206884.483
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2360 ft, W of the E Section Line, 2327 ft, S of the N Section Line

Lower Terminus: Roubideau Creek
Latitude: 38d42'53.3"N Longitude: 108d09'04.29"W
UTM North: 4289844.212 UTM East: 226010.492
NW1/4, SW1/4, Sctn34, T50N, R13W
1268 ft, E of the W Section Line, 1638 ft, N of the S Section Line

Counties: Montrose and Delta
Length: 20.62 miles
USGS Quad(s): Roubideau, Camel Back, Cottonwood Basin
ISF Appropriation: 3.6 cfs (April 1 – June 15)

APPENDIX – A
ISF Recommendation

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215-7093

www.co.blm.gov

IN REPLY REFER TO:
CO-932
7250

Mr Dan Merriman
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

JAN 0 5 2006

Dear Mr Merriman:

The Bureau of Land Management (BLM) is writing this letter to formally communicate its instream flow recommendation for Cottonwood Creek, located in Water Division 4.

Location and Land Status. Cottonwood Creek is tributary to Roubideau Creek approximately four miles west of the City of Delta. This recommendation covers the portion of the stream that runs from the headgate of the Hawkins Ditch to the confluence with Roubideau Creek. For this 20.62-mile reach, 86% is located on federals lands, 7% is located on state lands, and the remaining 7% is privately owned.

Biological Summary. Cottonwood Creek Creek is a moderate to high gradient stream that changes from a cold water fishery to a cool-water fishery as it traverses BLM lands. In the reach covered by this recommendation, snowmelt runoff flows provide suitable spawning habitat for sensitive species that migrate up into the creek from the Gunnison River. Fishery surveys indicate that this reach provides spawning habitat for bluehead sucker and flannelmouth sucker, as well as providing habitat for speckled dace. Flannelmouth sucker, and bluehead sucker are sensitive species in decline. BLM is working to keep these species off the list of threatened and endangered species by protecting suitable habitat.

R2Cross Analysis. 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.

> 3.60 cubic feet per second is recommended for the snowmelt runoff period from April 1 to June 14. This recommendation is driven by the average velocity criteria. Many portions of this reach are low gradient, and it is important to provide adequate velocity for fish spawning and incubation of eggs. Protecting flows during this time period is also important for recharging the alluvial aquifer, which provides groundwater for the riparian community during the late summer when the stream is dewatered by irrigation diversions.
>
> BLM is not making an instream flow recommendation for the remainder of the year for this reach. Naturally low flows, combined with upstream irrigation diversion, results in extremely low flows or a dry channel during the remainder of the year. Accordingly, BLM recommends that CWCB make an appropriation only for the snowmelt runoff

season, and that CWCB appropriate additional water at other times of the year only if additional flows become available.

Water Availability. There are multiple decreed irrigation diversions located near the upper end of the recommended reach. These ditches include Long Park Ditches 1 through 7 (conditional), the Pug White Ditch, the Hawkins Ditch, and the Everlasting Ditch. It appears that there is sufficient water availability for an instream flow appropriation during the snowmelt runoff period, but this set of ditches dewaters the lower reach after June 14, when snowmelt runoff flows recede. BLM is not aware of any historic gage data for Cottonwood 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 incorporates data from a gage located on lower Escalante Creek, which is the next watershed to north, and the methodology makes adjustments for irrigation diversions.

Relationship to Management Plans. This stream segment is important to BLM for several reasons. First, the reach is clearly a spawning area for sensitive fish that inhabit the Gunnison River. Second, BLM is undertaking efforts to improve riparian conditions on the reach, and riparian improvement will be hastened with protected flows. Finally, BLM plans to embark on a significant planning effort for the Dominguez-Escalante region and the planning effort will incorporate this creek. The plan will address the increasing recreational use in the area and the role that the creeks in these watersheds play in management for sensitive species and recreation uses.

The BLM requests that the Board recognize that this recommendation is based only upon the minimum flows necessary to support cool water fishery values. BLM may wish to work with the Board and/or through the Colorado water rights system to appropriate flows to optimally protect fish values and to protect other water-dependent values specified in BLM resource management plans.

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 M. Anania
Deputy State Director
Resources and Fire

4 Enclosures

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

APPENDIX – B
Field Data

COTTNWD2.WK1
COTTNWD2.PIC

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek - upper | CROSS-SECTION NO.: 2

CROSS SECTION LOCATION: near BLM - USFS boundary

DATE: 6-3-98 | OBSERVERS: R. Smith, B. Smith, D. Murphy

LEGAL DESCRIPTION: ¼ SECTION: SE SE | SECTION: 5 | TOWNSHIP: 49 N/S | RANGE: 13 E(W) | PM: N.M.

COUNTY: Delta | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699

MAP(S): USGS: Cottonwood Basin. | USFS:

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES) NO | METER TYPE: Marsh - McBirney

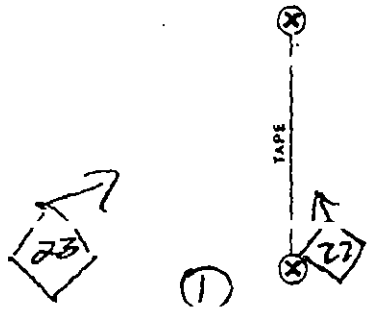
METER NUMBER: | DATE RATED: | CALIB/SPIN: ____ sec | TAPE WEIGHT: surveyed ____ lbs/100' | TAPE TENSION: surveyed ____ lbs

CHANNEL BED MATERIAL SIZE RANGE: gravel to one-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	5.92 / 5.94
② WS Upstream	15.0	5.56
③ WS Downstream	15.0	6.31
SLOPE	0.75'/30.0 =	0.012500

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

Tan PN

COMMENTS

very rocky stream - extremely variable water surface elevations.

flows were well past spring peak - early snowmelt and no precip during previous month.

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Cottonwood Creek | CROSS-SECTION: 2 | DATE: 6-3-98 | SHEET 1 of 1

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading: 0.2 ft | TIME: 3:30 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)
LD	RS+G	19.7		5.30								
	W	17.9	0.5	5.98	0.20				Ø		0.10	0
	R	16.9	1.0	5.91	0.25				2.03		0.25	0.5025
	R	15.9	1.0	5.97	0.20				1.63		0.20	0.3260
	R	14.9	1.0	6.00	0.35				1.58		0.35	0.5530
		13.9	1.0	6.29	0.30				2.21		0.30	0.6630
		12.9	1.0	6.25	0.35				2.30		0.25	0.8050
		11.9	1.0	6.30	0.30				0.44		0.30	0.1320
		10.9	1.0	6.56	0.20				0.50		0.20	0.1000
0	R	9.9	1.0	6.10	0.25				0.78		0.25	0.1950
		8.9	1.0	6.35	0.40				1.00		0.40	0.4000
		7.9	1.0	6.21	0.30				0.97		0.30	0.2910
		6.9	1.0	6.41	0.50				1.89		0.50	0.9450
		5.9	1.0	6.42	0.30				0.88		0.30	0.2640
		4.9	1.0	6.40	0.35				1.85		0.35	0.6475
		3.9	1.0	6.47	0.40				1.22		0.40	0.4880
		2.9	0.7	6.37	0.10				0.15		0.07	0.0105
	W	2.5	0.2	5.92	0				Ø		0	0
		1.5		5.98								
0	G+LS	0		5.25								
1	W											
	TOTALS		15.4								4.62	6.3275

Method of Measurement | Time 4 pm | Gage Reading: 0.2 ft | CALCULATIONS PERFORMED BY | CALCULATIONS CHECKED BY

PROOF SHEET

LOCATION INFORMATION

STREAM NAME	Cottonwood Creek
XS LOCATION	near BLM-USFS boundary
XS NUMBER	2
DATE	06-03-98
OBSERVERS	R Smith, D Smith, D Murphy
1/4 SEC	SE SE
SECTION	5
TWP	49 N
RANGE	13 W
PM:	N M
COUNTY	Delta
WATERSHED	Gunnison
DIVISION:	4
DOW CODE:	39699
USGS MAP	Cottonwood Basin
USFS MAP	

SUPPLEMENTAL DATA

TAPE WT	0.0001
TENSION	99999

CHANNEL PROFILE DATA

SLOPE	0.025

INPUT DATA # DATA POINTS= 20

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
1 G S		0.00	5.28	0.00	0.00	0.00	0.00	0.00
		1.50	5.91	0.00	0.00	0.00	0.00	0.00
	W	2.50	5.92	0.00	0.00	0.00	0.00	0.00
		2.90	6.37	0.46	0.15	0.32	0.05	5.91
		3.90	6.47	0.56	1.22	0.56	0.69	5.91
		4.90	6.40	0.49	1.85	0.49	0.91	5.91
		5.90	6.42	0.51	0.88	0.51	0.45	5.91
		6.30	6.41	0.50	1.89	0.50	0.95	5.91
		7.90	6.11	0.20	0.97	0.20	0.29	5.91
		8.90	6.35	0.44	1.00	0.44	0.44	5.91
	R	9.90	6.10	0.19	0.79	0.19	0.15	5.91
		10.90	6.36	0.45	0.50	0.45	0.23	5.91
		11.90	6.30	0.39	0.44	0.39	0.17	5.91
		12.90	6.25	0.34	2.30	0.34	0.78	5.91
		13.90	6.29	0.38	2.21	0.38	0.84	5.91
	R	14.90	6.00	0.09	1.58	0.09	0.14	5.91
	R	15.90	5.97	0.06	1.63	0.06	0.10	5.91
	W	16.90	5.91	0.00	2.03	0.00	0.00	0.00
		17.90	5.90	0.00	0.00	0.00	0.00	0.00
1 G S		19.70	5.30	0.00	0.00	0.00	0.00	0.00
		TOTALS				5.02	6.17	

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

LOCATION INFORMATION

STREAM NAME Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER 2

DATE 06-03-98
OBSERVERS R Smith, D Smith, D Murphy

1/4 SEC SE SE
SECTION 5
TWP 49 N
RANGE 13 W
PM N M.

COUNTY Delta
WATERSHED Gunnison
DIVISION 4
DOW CODE 39699

USGS MAP Cottonwood Basin
USFS MAP

SUPPLEMENTAL DATA

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

TAPE WT 0 0001
TENSION 99999

CHANNEL PROFILE DATA

SLOPE 0 025

INPUT DATA CHECKED BY DATE

ASSIGNED TO DATE

STREAM NAME Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER 2

INPUT DATA # DATA POINTS= 20

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
1 G S	0.00	5.25	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
	1.50	5.91	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
W	2.50	5.92	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
	3.90	6.37	0.46	0.15	0.60	0.46	0.32	0.05	0.8%
	5.90	6.47	0.56	1.22	1.00	0.56	0.56	0.68	11.1%
	4.90	6.40	0.49	1.85	1.00	0.49	0.49	0.91	14.7%
	5.90	6.42	0.51	0.88	1.00	0.51	0.51	0.45	7.3%
	6.90	6.41	0.50	1.89	1.00	0.50	0.50	0.95	15.3%
	7.90	6.21	0.30	0.97	1.02	0.30	0.30	0.29	4.7%
	8.90	6.35	0.44	1.00	1.01	0.44	0.44	0.44	7.1%
R	9.90	6.10	0.19	0.78	1.03	0.19	0.19	0.15	2.4%
	10.90	6.36	0.45	0.50	1.03	0.45	0.45	0.23	3.6%
	11.90	6.30	0.39	0.44	1.00	0.39	0.39	0.17	2.8%
	12.90	6.25	0.34	2.30	1.00	0.34	0.34	0.78	12.7%
	13.90	6.29	0.38	2.21	1.00	0.38	0.38	0.84	13.6%
R	14.90	6.00	0.09	1.58	1.04	0.09	0.09	0.14	2.3%
R	15.90	5.97	0.06	1.63	1.00	0.06	0.06	0.10	1.6%
W	16.90	5.91	0.00	2.03	1.00	0.00	0.00	0.00	0.0%
	17.90	5.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
1 G S	19.70	5.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
TOTALS					14.75	0.56	5.02	6.17	100.0%
						(Max)			

Manning's n = 0.033

STREAM NAME Cottonwood Cre
XS LOCATION near BLM-USFS
XS NUMBER 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
5.67	5.02	9.19	83.1%
5.69	5.02	8.84	76.0%
5.71	5.02	8.49	69.1%
5.73	5.02	8.14	62.1%
5.75	5.02	7.80	55.3%
5.77	5.02	7.45	48.4%
5.79	5.02	7.11	41.6%
5.81	5.02	6.77	34.8%
5.83	5.02	6.43	28.1%
5.85	5.02	6.10	21.5%
5.87	5.02	5.77	14.8%
5.88	5.02	5.60	11.5%
5.89	5.02	5.44	8.2%
5.90	5.02	5.27	4.9%
5.91	5.02	5.11	1.7%
5.92	5.02	4.95	-1.4%
5.93	5.02	4.81	-4.2%
5.94	5.02	4.67	-7.0%
5.95	5.02	4.53	-9.8%
5.96	5.02	4.39	-12.5%
5.97	5.02	4.26	-15.2%
5.99	5.02	3.99	-20.5%
6.01	5.02	3.74	-25.4%
6.03	5.02	3.50	-30.2%
6.05	5.02	3.26	-35.2%
6.07	5.02	3.01	-40.0%
6.09	5.02	2.77	-44.8%
6.11	5.02	2.54	-49.5%
6.13	5.02	2.30	-54.2%
6.15	5.02	2.07	-58.7%
6.17	5.02	1.85	-63.2%

WATERLINE AT ZERO
AREA ERROR = 5.911

STREAM NAME Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER 2

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 PER (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG VELOCITY (FT/SEC)
GL	5.30	19.59	0.82	1.17	15.99	20.10	100.0%	0.79	34.52	2.16
	5.31	19.53	0.81	1.16	15.78	20.10	99.7%	0.79	33.83	2.14
	5.36	19.27	0.77	1.11	14.81	19.82	98.3%	0.75	30.74	2.08
	5.41	19.00	0.73	1.06	13.86	19.54	96.9%	0.71	27.77	2.00
	5.46	18.74	0.69	1.01	12.91	19.26	95.5%	0.67	24.93	1.93
	5.51	18.48	0.65	0.96	11.98	18.97	94.1%	0.63	22.21	1.85
	5.56	18.21	0.61	0.91	11.07	18.69	92.7%	0.59	19.66	1.78
	5.61	17.95	0.57	0.86	10.16	18.41	91.3%	0.55	17.27	1.70
	5.66	17.69	0.52	0.81	9.27	18.13	89.9%	0.51	14.94	1.61
	5.71	17.42	0.48	0.76	8.39	17.85	88.5%	0.47	12.79	1.52
	5.76	17.16	0.44	0.71	7.53	17.56	87.1%	0.43	10.79	1.43
	5.81	16.89	0.40	0.66	6.68	17.28	85.7%	0.39	8.95	1.34
	5.86	16.63	0.35	0.61	5.84	17.00	84.3%	0.34	7.22	1.24
WL	5.91	15.34	0.33	0.56	5.02	15.69	77.8%	0.32	5.92	1.18
	5.96	13.52	0.32	0.51	4.32	13.85	68.7%	0.31	5.00	1.16
	6.01	12.28	0.30	0.46	3.68	12.53	62.4%	0.29	4.08	1.11
	6.06	12.07	0.25	0.41	3.07	12.34	61.2%	0.25	3.05	1.00
	6.11	11.77	0.21	0.36	2.47	12.01	59.6%	0.21	2.17	0.88
	6.16	11.16	0.17	0.31	1.90	11.26	56.3%	0.17	1.45	0.76
	6.21	10.54	0.13	0.26	1.35	10.70	53.1%	0.13	0.86	0.64
	6.26	8.95	0.10	0.21	0.86	8.96	44.4%	0.10	0.45	0.53
	6.31	6.90	0.08	0.16	0.50	6.56	30.1%	0.08	0.24	0.48
	6.36	4.26	0.06	0.11	0.24	4.27	21.2%	0.06	0.09	0.37
	6.41	2.86	0.02	0.06	0.05	2.67	14.7%	0.02	0.01	0.17
	6.46	0.23	0.00	0.01	0.00	0.23	1.1%	0.00	0.00	0.07

STREAM NAME Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	6.17 cfs
CALCULATED FLOW (Qc)=	5.91 cfs
(Qm-Qc)/Qm * 100 =	4.1 %
MEASURED WATERLINE (WLm)=	5.92 ft
CALCULATED WATERLINE (WLc)=	5.91 ft
(WLm-WLc)/WLm * 100 =	0.1 %
MAX MEASURED DEPTH (Dm)=	0.56 ft
MAX CALCULATED DEPTH (Dc)=	0.56 ft
(Dm-Dc)/Dm * 100	0.1 %
MEAN VELOCITY=	1.18 ft/sec
MANNING'S N=	0.093
SLOPE=	0.025 ft/ft
4 * Qm =	2.5 cfs
2.5 * Qm=	15.4 cfs

RECOMMENDED INSTREAM FLOW

FLOW (CFS)	PERIOD

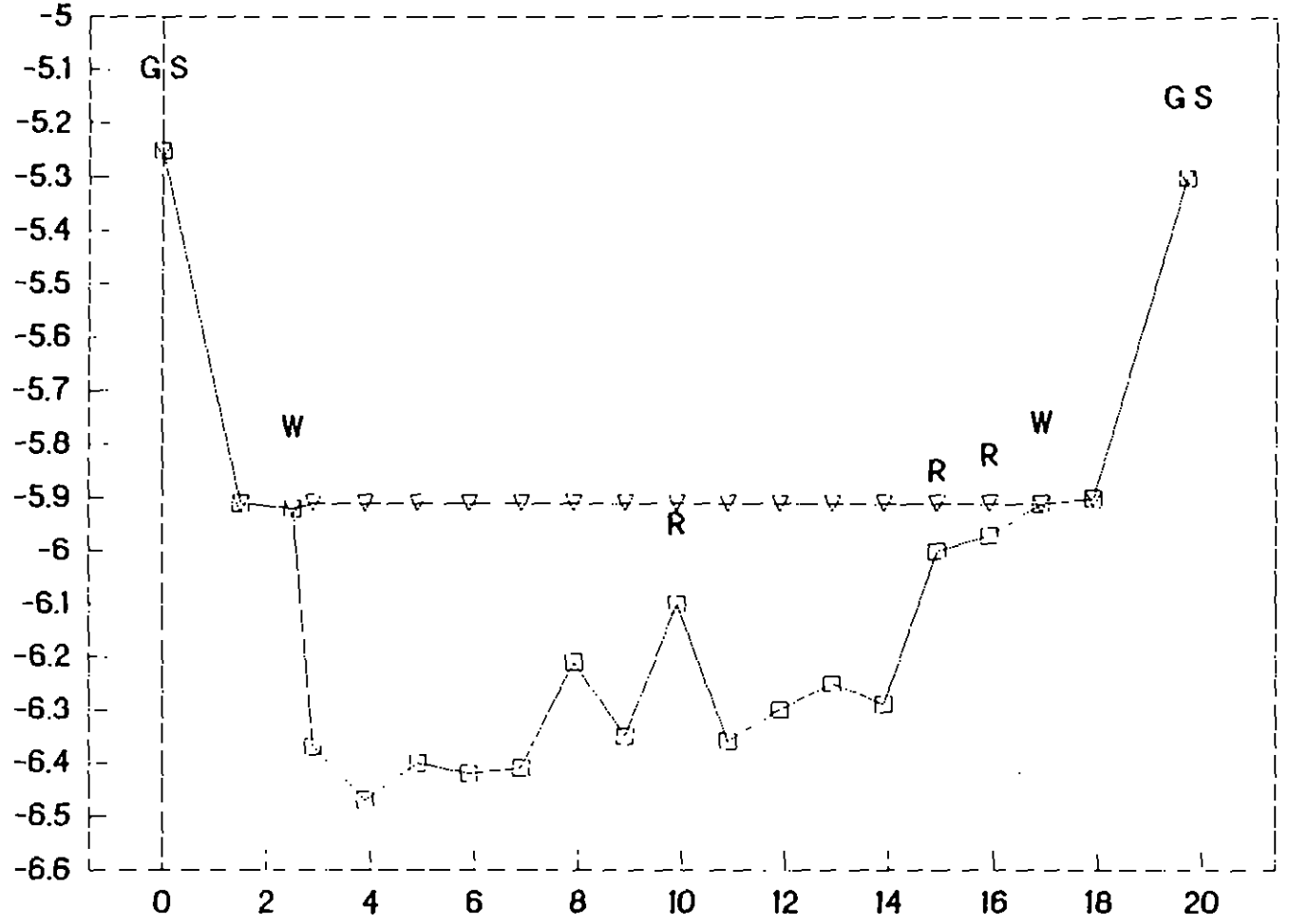
RATIONALE FOR RECOMMENDATION

RECOMMENDATION BY AGENCY DATE

CWCB REVIEW BY DATE

Cottonwood Creek

CROSS SECTION DATA ANALYSIS



COTTNWD2.WK1
COTTNWD2.PIC

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek - ~~upper~~ lower
CROSS SECTION LOCATION: near BLM - USFS boundary
CROSS-SECTION NO: 2

DATE: 6-3-98 | OBSERVERS: R. Smith, D. Smith, D. Murphy

LEGAL DESCRIPTION | SECTION: SE SE | SECTION: 5 | TOWNSHIP: 49 N/S | RANGE: 13 E(W) | PM: N.M.
COUNTY: Delta | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699
MAP(S) | USGS: Cottonwood Basin. | USFS:

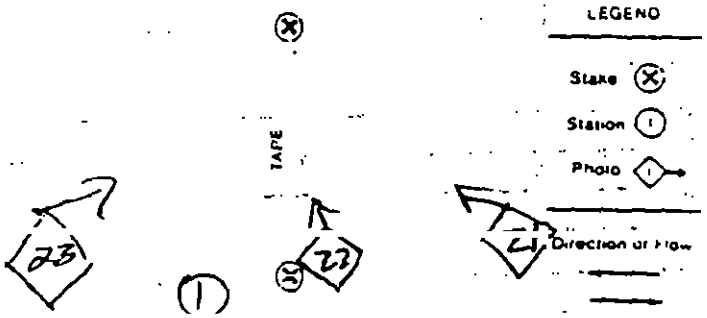
SUPPLEMENTAL DATA

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: gravel to one-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	5.92 / 5.94
② WS Upstream	15.0	5.56
① WS Downstream	15.0	6.31

SLOPE: 0.75'/30.0 = 0.02500



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

Many

COMMENTS

Very rocky stream - extremely variable water surface elevations.

Flows were well past annual peak - early snowmelt and no precip during previous month.

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Cottonwood Creek | CROSS-SECTION NO: 2 | DATE: 6-3-98 | SHEET 1 OF 1

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading: 0.2 ft | TIME 3:30 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	Velocity (ft/sec): Time (sec)	Velocity (ft/sec): At Point	Velocity (ft/sec): Mean in Vertical	Area (m^2)	Discharge (cfs)
0 RS+G	19.7		5.30								
W	17.9	0.5	5.98	0.20				Ø		0.10	0
R	16.9	1.0	5.91	0.25				2.03		0.25	0.5025
R	15.9	1.0	5.97	0.20				1.63		0.20	0.3260
R	14.9	1.0	6.00	0.35				1.58		0.35	0.5530
	13.9	1.0	6.29	0.30				2.21		0.30	0.6630
	12.9	1.0	6.25	0.35				2.30		0.35	0.8050
	11.9	1.0	6.30	0.30				0.44		0.30	0.1320
	10.9	1.0	6.36	0.20				0.50		0.20	0.1000
0 R	9.9	1.0	6.10	0.25				0.78		0.25	0.1950
	8.9	1.0	6.35	0.40				1.00		0.40	0.4000
	7.9	1.0	6.21	0.30				0.97		0.30	0.2910
	6.9	1.0	6.41	0.50				1.89		0.50	0.9450
	5.9	1.0	6.42	0.30				0.88		0.30	0.2640
	4.9	1.0	6.40	0.35				1.85		0.35	0.6475
	3.9	1.0	6.47	0.40				1.22		0.40	0.4880
	2.9	0.7	6.37	0.10				0.15		0.07	0.0105
W	2.5	0.2	5.92	0				Ø		0	0
	1.5		5.98								
0 G+LS	0		5.25								
1 W											
TOTALS		15.4								4.62	6.3275

End of Measurement | Time 4 PM | Gage Reading 0.2 ft | CALCULATIONS PERFORMED BY: | CALCULATIONS CHECKED BY:

PROOF SHEET

LOCATION INFORMATION

STREAM NAME:	Cottonwood Creek
XS LOCATION:	near BLM-USFS boundary
XS NUMBER	2
DATE.	06-03-98
OBSERVERS:	R. Smith, D. Smith, D Murphy
1/4 SEC:	SE SE
SECTION:	5
TWP	49 N
RANGE:	13 W
PM:	N.M.
COUNTY:	Delta
WATERSHED:	Gunnison
DIVISION:	4
DOW CODE:	39699
USGS MAP:	Cottonwood Basin
USFS MAP:	

SUPPLEMENTAL DATA

TAPE WT	0 0001
TENSION	99999

CHANNEL PROFILE DATA

SLOPE:	0.025

INPUT DATA # DATA POINTS= 20

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
1	G S	0 00	5.25	0 00	0 00	0.00	0.00	0 00
		1 50	5.91	0 00	0 00	0 00	0 00	0 00
	W	2.50	5.92	0 00	0 00	0.00	0 00	0 00
		2.90	6 37	0.46	0 15	0.32	0 05	5 91
		3.90	6 47	0 56	1 22	0 56	0 68	5.91
		4.90	6 40	0.49	1 85	0.49	0 91	5.91
		5 90	6.42	0 51	0 88	0.51	0 45	5.91
		6 90	6 41	0 50	1.89	0.50	0 95	5 91
		7 90	6 21	0 30	0.37	0 30	0 29	5.91
		8 90	6 35	0 44	1 00	0 44	0 44	5.91
	R	9 90	6 10	0 19	0 78	0.19	0 15	5.91
		10 90	6 36	0 45	0 50	0 45	0.23	5.91
		11 90	6.30	0.39	0.44	0 39	0 17	5 91
		12.90	6 25	0 34	2.30	0 34	0 78	5 91
		13.90	6 29	0 38	2.21	0.38	0 84	5.91
	R	14.90	6 00	0 09	1 58	0.09	0 14	5 91
	R	15.90	5.97	0.06	1 63	0.06	0 10	5.91
	W	16.90	5.91	0.00	2 03	0.00	0 00	0 00
		17 90	5.90	0.00	0 00	0.00	0 00	0 00
1	G S	19 70	5.30	0.00	0.00	0 00	0 00	0 00
					TOTALS	5 02	6 17	

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

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER: 2

DATE: 06-03-98
OBSERVERS: R. Smith, D. Smith, D Murphy

1/4 SEC: SE SE
SECTION: 5
TWP: 49 N
RANGE: 13 W
PM: N M.

COUNTY: Delta
WATERSHED: Gunnison
DIVISION: 4
DOW CODE: 39699

USGS MAP: Cottonwood Basin
USFS MAP

SUPPLEMENTAL DATA

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

TAPE WT: 0 0001
TENSION: 99999

CHANNEL PROFILE DATA

SLOPE: 0 025

INPUT DATA CHECKED BY Bill Carey DATE 10/7/98

ASSIGNED TO: DATE

STREAM NAME: Cottonwood Creek
XS LOCATION: near BLM-USFS boundary
XS NUMBER: 2

INPUT DATA # DATA POINTS= 20

VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM	WATER DEPTH	AREA (Am)	Q (Qmi	% Q CELL
1	G S	0.00	5.25	0.00	0.00	0 00	0 00	0 00	0 00	0 0%
		1.50	5.91	0.00	0.00	0.00	0 00	0 00	0 00	0 0%
	W	2 50	5.92	0.00	0 00	0.00	0 00	0 00	0.00	0.0%
		2 90	6.37	0 46	0.15	0 60	0 46	0 32	0 05	0 8%
		3.90	6 47	0 56	1.22	1 00	0 56	0 56	0 68	11 1%
		4.90	6 40	0.49	1 85	1 00	0 49	0.49	0 91	14 7%
		5 90	6.42	0 51	0 88	1.00	0.51	0.51	0.45	7.3%
		6 90	6.41	0 50	1.89	1 00	0.50	0 50	0 95	15.3%
		7.90	6 21	0.30	0.97	1 02	0 30	0 30	0.29	4 7%
		8 90	6 35	0.44	1 00	1 01	0 44	0 44	0.44	7 1%
	R	9 90	6 10	0 19	0 78	1 03	0.19	0.19	0 15	2.4%
		10.90	6 36	0 45	0 50	1.03	0 45	0 45	0.23	3.6%
		11.90	6.30	0 39	0.44	1 00	0.39	0 39	0.17	2.8%
		12 90	6.25	0 34	2.30	1 00	0.34	0 34	0 78	12 7%
		13 90	6 29	0 38	2.21	1 00	0 38	0 38	0.84	13 6%
	R	14 90	6 00	0 09	1 58	1.04	0 09	0 09	0.14	2 3%
	R	15 90	5.97	0 06	1.63	1.00	0 06	0.06	0.10	1 6%
	W	16 90	5 91	0.00	2 03	1 00	0.00	0.00	0 00	0 0%
		17 90	5.90	0 00	0.00	0 00	0 00	0 00	0 00	0 0%
1	G S	19 70	5.30	0 00	0.00	0.00	0 00	0 00	0 00	0 0%
		TOTALS				14 75	0 56 (Max)	5.02	0 17	100.0%

Manning's n = 0 0933

STREAM NAME. Cottonwood Cre
XS LOCATION near BLM-USFS
XS NUMBER 2

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
5.67	5 02	9 19	83 1%
5 69	5.02	8 84	76 0%
5.71	5 02	8.49	69 1%
5 73	5.02	6 14	62 1%
5.75	5 02	7.80	55.3%
5.77	5 02	7 45	48 4%
5 79	5.02	7 11	41.6%
5.81	5 02	6.77	34 8%
5 83	5 02	6 43	28.1%
5 85	5.02	6.10	21 5%
5.87	5 02	5 77	14 8%
5 88	5.02	5.60	11 5%
5.89	5 02	5 44	8 2%
5 90	5.02	5.27	4 9%
5 91	5.02	5.11	1 7%
5 92	5 02	4 95	-1.4%
5 93	5.02	4.81	-4 2%
5.94	5.02	4 67	-7.0%
5 95	5.02	4.53	-9 8%
5 96	5 02	4.39	-12.5%
5.97	5 02	4.26	-15 2%
5 99	5 02	3.99	-20.5%
6.01	5 02	3 74	-25.4%
6 03	5 02	3.50	-30 3%
6.05	5 02	3 26	-35 2%
6 07	5 02	3.01	-40 0%
6 09	5 02	2 77	-44.8%
6.11	5.02	2.54	-49.5%
6 13	5.02	2.30	-54 2%
6.15	5.02	2 07	-58 7%
6 17	5 02	1 85	-63.2%

WATERLINE AT ZERO
AREA ERROR = 5 911

STREAM NAME Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER 2

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 PER (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
"GL"	5.30	19.59	0 82	1 17	15 99	20 16	100 0%	0.79	34 52	2 16
	5 31	19.53	0.81	1 16	15.78	20 10	99 7%	0 79	33 85	2.14
	5 36	19.27	0.77	1.11	14.81	19 82	98.3%	0 75	30 74	2.08
	5 41	19.00	0 73	1.06	13.86	19 54	96 9%	0 71	27 77	2 00
	5 46	18 74	0.69	1.01	12.91	19 26	95 5%	0 67	24 93	1 93
	5.51	18 48	0.65	0 96	11 98	18 97	94 1%	0 63	22 23	1 85
	5.56	18 21	0 61	0 91	11 07	18 69	92 7%	0 59	19 66	1.78
	5.61	17.95	0 57	0.86	10 16	18 41	91 3%	0 55	17 23	1 70
	5.66	17.69	0 52	0 81	9 27	18 13	89 9%	0.51	14 94	1.61
	5.71	17.42	0.48	0.76	8.39	17.85	88.5%	0.47	12.79	1 52
	5.76	17.16	0.44	0 71	7.53	17.56	87.1%	0 43	10.79	1 43
	5 81	16 89	0.40	0.66	6 68	17.28	85 7%	0 39	8 93	1 34
	5.86	16.63	0.35	0.61	5 84	17 00	84 3%	0 36	7 22	1.24
"WL"	5.91	15 34	0 33	0 56	5 02	15 69	77 8%	0 32	5 92	1 18
	5 96	13.52	0.32	0 51	4 32	13 85	68 7%	0 31	5 00	1 16
	6 01	12.28	0.30	0 46	3.68	12 59	62 4%	0.29	4 08	1 11
	6 06	12.07	0.25	0.41	3.07	12 34	61.2%	0.25	3 05	1.00
	6 11	11.77	0.21	0 36	2.47	12.01	59.6%	0 21	2 17	0 88
	6 16	11.16	0 17	0.31	1.90	11.36	56.3%	0.17	1.45	0.76
	6 21	10.54	0.13	0.26	1.35	10 70	53.1%	0.13	0.86	0 64
	6.26	8.85	0 10	0 21	0 86	8 96	44.4%	0.10	0.45	0.53
	6.31	6.00	0 08	0 16	0.50	6 06	30.1%	0 08	0 24	0.48
	6.36	4 26	0 06	0.11	0.24	4.27	21 2%	0 06	0 09	0 37
	6 41	2 86	0.02	0.06	0.05	2 87	14 2%	0 02	0 01	0 17
	6 46	0.23	0 00	0 01	0.00	0 23	1.1%	0 00	0 00	0.07

$\overline{Nd}$ $\frac{0.2-0.17}{0.21-0.17} = \frac{x-1.45}{2.17-1.45}$ $x = 1.99$

STREAM NAME: Cottonwood Creek
XS LOCATION near BLM-USFS boundary
XS NUMBER. 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	6.17 cfs
CALCULATED FLOW (Qc)=	5 92 cfs
(Qm-Qc)/Qm * 100 =	4 1 %
MEASURED WATERLINE (WLm)=	5 92 ft
CALCULATED WATERLINE (WLc)=	5.91 ft
(WLm-WLc)/WLm * 100 =	0.1 %
MAX MEASURED DEPTH (Dm)=	0.56 ft
MAX CALCULATED DEPTH (Dc)=	0 56 ft
(Dm-Dc)/Dm * 100	0 1 %
MEAN VELOCITY=	1 18 ft/sec
MANNING'S N=	0 093
SLOPE=	0.025 ft/ft
.4 * Qm =	2 5 cfs
2.5 * Qm=	15 4 cfs

RECOMMENDED INSTREAM FLOW

FLOW (CFS)	PERIOD
3.05	Summer
1.99	Winter

RATIONALE FOR RECOMMENDATION:

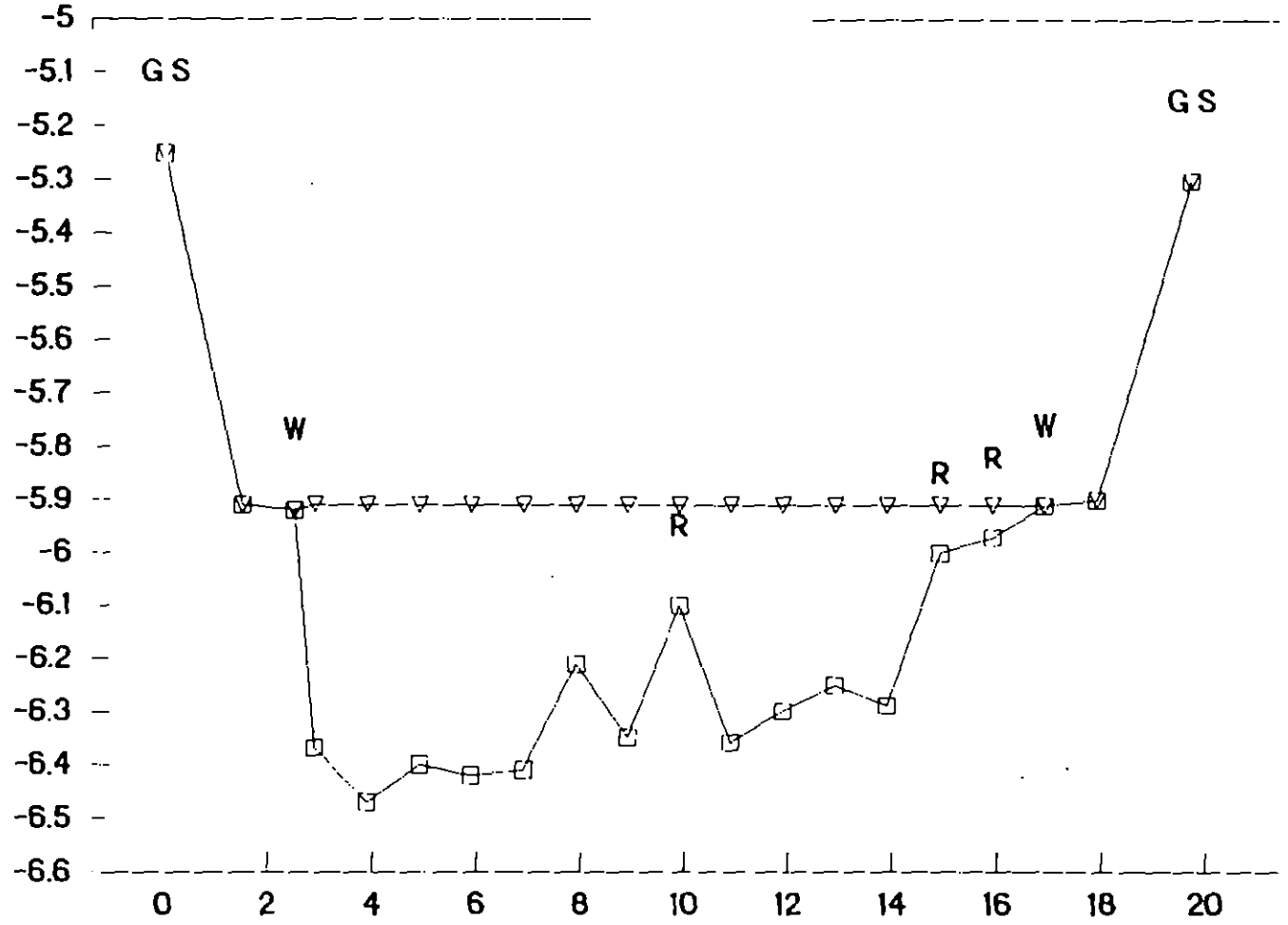
A summer flow of 3.05 cfs will satisfy all 3 criteria
A winter flow of 1.99 cfs will satisfy 3 of 3 criteria

RECOMMENDATION BY: Bill Carey AGENCY. BLM DATE 10/7/98

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

Cottonwood Creek

CROSS SECTION DATA ANALYSIS



VERTICAL DEPTH (FT)

DISTANCE FROM STAKE (FT)

□ Channel Bottom ▽ Computed Water Line

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek—upper | CROSS-SECTION NO: 2

CROSS-SECTION LOCATION: Near Tabeguache Trail crossing

DATE: 6-18-08 | OBSERVERS: R. Smith, D. Murphy

LEGAL DESCRIPTION: ¼ SECTION: NE NE | SECTION: 26 | TOWNSHIP: 49 (N)S | RANGE: 14 E(W) | PM: N.M.

COUNTY: Montrose/Mesa | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699

MAP(S): USGS: Cottonwood Basin 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

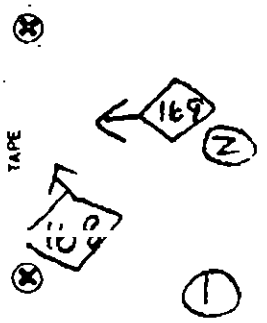
CHANNEL BED MATERIAL SIZE RANGE: gravel to 8" cobbles | PHOTOGRAPHS TAKEN (YES)/NO | NUMBER OF PHOTOGRAPHS: 3

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	6.83 / 6.84
② WS Upstream	8.0	6.70
③ WS Downstream	8.0	6.98

SLOPE | 0.28 | 16.0 = 0.0175

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
see attached survey																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME

mayfly, caddisfly

COMMENTS

Ph = 8.4 Cond = 50 Stream Temp = 15° C

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Cottonwood Creek - upper | CROSS-SECTION NO: 2 | DATE: 6-18-03 | SHEET 1 OF 1

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading .25 ft | TIME 7:00

Features (Stake (S), Grassline (G), Waterline (W), Rock (R))	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
S	4.0		5.75								
G	4.3		6.14								
W	6.0		6.93	.10					0.09		
	6.5		6.97	.15					0.35		
	7.0		7.02	.20					0.43		
	7.25		7.13	.30					0.36		
	7.50		7.04	.20					0.69		
	7.75		6.98	.15					0.89		
	8.00		7.09	.25					0.64		
	8.25		7.01	.20					0.49		
	8.50		7.00	.15					0.47		
	8.75		7.02	.20					0.43		
	9.00		7.11	.30					0.35		
	9.25		7.03	.20					0.47		
	9.50		6.98	.15					0.22		
	9.75		6.90	.10					0.05		
	10.00		7.00	.15					0.17		
	10.25		6.95	.15					0.29		
	10.50		6.98	.15					0.34		
	10.75		6.97	.15					0.23		
	11.00		6.89	.10					0.08		
	11.50		6.90	.10					0.06		
	12.00		6.95	.15					0.54		
	12.50		6.99	.15					0.28		
	13.00		6.94	.10					0.03		
W	13.50		6.84	Ø					Ø		
	14.00		6.14								
S	19.00		5.58								

TOTALS

End of Measurement | Time 7:30 | Gage Reading .25 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	Cottonwood Creek
XS LOCATION	near Tabeguache trail crossing
XS NUMBER	2
DATE	6/18/03
OBSERVERS	Smith and Murphy
1/4 SEC	NE NE
SECTION	26
TWP	49N
RANGE	14W
PM	N M
COUNTY	Montrose
WATERSHED	Gunnison
DIVISION	4
DOW CODE	39699
USGS MAP	Cottonwood Basin 7.5' quad
USFS MAP	

SUPPLEMENTAL DATA

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

TAPE WT	0.0001
TENSION	99999

CHANNEL PROFILE DATA

SLOPE	0.0175

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

ASSIGNED TO . ... DATE .. .

STREAM NAME. Cottonwood Creek
XS LOCATION near Tabeguache trail crossing
XS NUMBER. 2

SUMMARY SHEET

MEASURED FLOW (Qm)=	0.43 cfs
CALCULATED FLOW (Qc)=	6.02 cfs
(Qm-Qc)/Qm * 100 =	-1288.6 %
MEASURED WATERLINE (WLm)=	6.49 ft
CALCULATED WATERLINE (WLc)=	6.24 ft
(WLm-WLc)/WLm * 100 =	3.9 %
MAX MEASURED DEPTH (Dm)=	0.3 ft
MAX CALCULATED DEPTH (Dc)=	0.89 ft
(Dm-Dc)/Dm * 100	-196.7 %
MEAN VELOCITY=	0.98 ft/sec
MANNING'S N=	0.145
SLOPE=	0.0175 ft/ft
4 * Qm =	0.2 cfs
2.5 * Qm=	1.1 cfs

RECOMMENDED INSTREAM FLOW

FLOW (CFS)	PERIOD
0.73	winter

RATIONALE FOR RECOMMENDATION

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

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

STREAM NAME Cottonwood Creek
XS LOCATION near Taheguache trail crossing
XS NUMBER 2

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)
	6 14	9.7	0 73	0 99	7.13	10 42	100 00%	0 68	7 48	1.05
	6 19	9 56	0 7	0 94	6 65	10 24	98 30%	0 65	6 73	1 01
	6 24	9 41	0 66	0 89	6 17	10 06	96 50%	0 61	6 02	0 98
GL	6 29	9 27	0 62	0 84	5 7	9 88	94 80%	0 58	5 35	0 94
	6 34	9 13	0 57	0 79	5 25	9 7	93 10%	0 54	4 71	0 9
WL	6 39	8 98	0 53	0 74	4 79	9 52	91 40%	0 5	4 1	0.86
	6 44	8 84	0 49	0 69	4 35	9 34	89 60%	0 47	3 53	0 81
	6 49	8 7	0 45	0 64	3.91	9 16	87.90%	0 43	2 99	0 77
	6 54	8 55	0 41	0 59	3 48	8 98	86 20%	0.39	2 5	0 72
	6 59	8 41	0 36	0 54	3 05	8 8	84 40%	0 35	2 04	0 67
	6 64	8 27	0 32	0.49	2.64	8 62	82 70%	0 3i	1 62	0 61
	6 69	8 12	0 27	0 44	2.23	8 44	81 00%	0 26	1 24	0 56
	6 74	7 98	0 23	0 39	1 82	8 26	79 30%	0 22	0 9	0 49
	6 79	7 84	0 18	0 34	1 43	8 08	77 50%	0 18	0 61	0 43
	6 84	7.69	0.14	0 29	1 04	7 9	75 80%	0 13	0 36	0 35
	6 89	7 34	0 09	0.24	0 66	7 53	72 20%	0.09	0 18	0 27
	6 94	5 59	0 06	0 19	0.33	5.75	55.10%	0 06	0 07	0 21
	6 99	2 76	0 05	0 14	0 13	2 88	27 60%	0 05	0 02	0 17
	7 04	1 14	0 04	0.09	0 04	1 21	11 60%	0 03	0 01	0 14
	7 09	0 32	0 02	0 04	0.01	0 34	3 30%	0 02	0	0 08

Criteria

Range: 0.2 - 1.1 cfs

1) $0.2' \bar{d}$ = 0.23 cfs

2) 50% WP = 0.024 cfs

3) 1 ft/sec $\bar{v}$ = 6.49 cfs

STREAM NAME Cottonwood Creek
XS LOCATION near Taberuache trail crossing
XS NUMBER 2

INPUT DATA # 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	4	5.75	0	0	0	0	0	0	0 00%
G	4 3	6 14	0	0	0	0	0	0	0 00%
W	6	6 93	0 1	0 09	1 87	0 1	0 11	0 01	2 30%
	6 5	6 97	0.15	0 35	0 5	0 15	0.08	0.03	6 10%
	7	7 02	0 2	0 43	0 5	0.2	0 08	0 03	7 40%
	7 25	7 13	0 3	0.36	0.27	0 3	0 08	0 03	6 20%
	7 5	7 04	0.2	0 69	0 27	0 2	0 05	0 03	8 00%
	7 75	6 98	0 15	0.89	0 26	0 15	0 04	0 03	7 70%
	8	7 09	0 25	0 64	0 27	0 25	0 06	0 04	9 20%
	8 25	7 01	0 2	0.49	0.26	0 2	0 05	0 02	5 60%
	8 5	7	0 15	0 47	0 25	0 15	0 04	0 02	4 10%
	8 75	7 02	0.2	0 43	0 25	0 2	0 05	0 02	5 00%
	9	7 11	0 3	0 35	0 27	0 3	0 08	0 03	6 10%
	9 25	7 03	0 2	0 47	0 26	0 2	0 05	0 02	5 40%
	9 5	6 98	0 15	0 22	0 25	0 15	0 04	0 01	1 90%
	9 75	6 9	0 1	0 05	0 26	0 1	0.03	0	0 30%
	10	7	0 15	0 17	0 27	0 15	0 04	0 01	1 50%
	10 25	6 95	0 15	0 29	0 25	0 15	0 04	0 01	2.50%
	10 5	6 98	0 15	0.34	0.25	0.15	0 04	0 01	2 90%
	10.75	6 97	0 15	0 23	0 25	0 15	0 04	0 01	2 00%
	11	6 89	0.1	0 08	0.26	0.1	0 04	0	0 70%
	11.5	6 9	0 1	0 06	0 5	0 1	0 05	0	0 70%
	12	6 95	0 15	0.54	0 5	0 15	0 08	0 04	9 30%
	12 5	6 99	0 15	0.28	0 5	0.15	0 08	0 02	4 80%
	13	6 94	0 1	0 03	0 5	0 1	0 05	0	0 30%
W	13 5	6 84	0	0	0 51	0	0	0	0 00%
G	14	6 14	0	0	0	0	0	0	0 00%
S	19	5 58	0	0	0	0	0	0	0 00%
TOTALS ----------					9 56	0 3 (Max)	1 25	0 43	100 00%

Manning's n = 0 1454

STREAM NAME Cottonwood Creek
XS LOCATION near Tabeguache trail crossing
XS NUMBER 2

PROOF SHEET

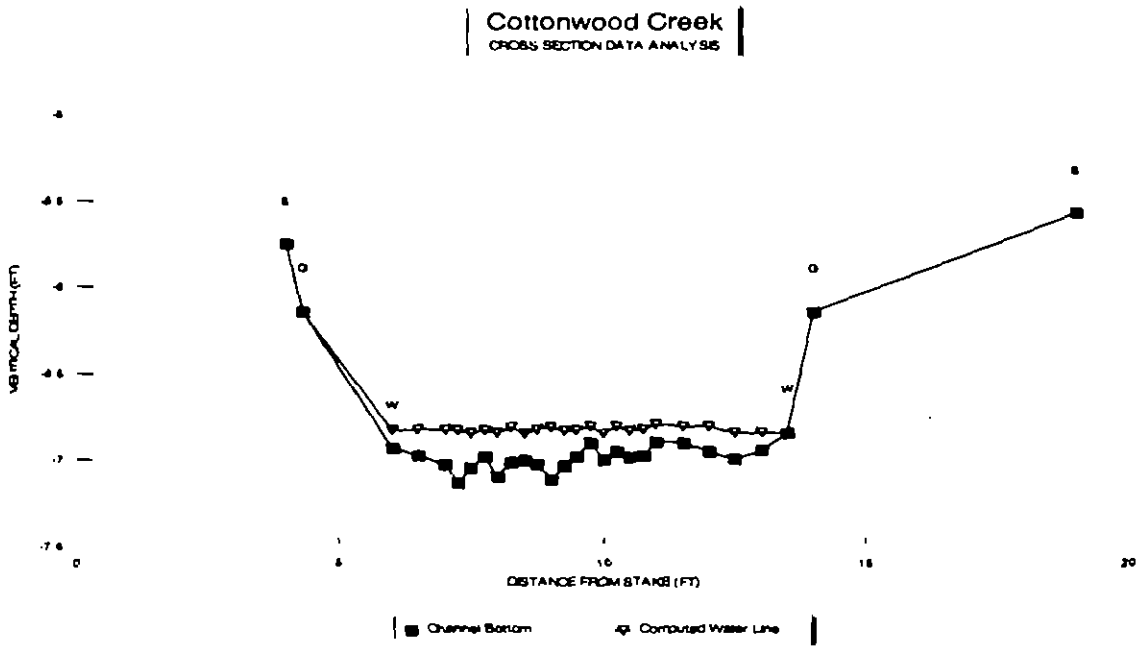
WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
6.24	1 25	6 17	394 80%
6 26	1 25	5 98	379 70%
6 28	1 25	5 8	364 80%
6 3	1 25	5 61	349 90%
6 32	1 25	5 43	335.10%
6 34	1 25	5 25	320 40%
6 36	1 25	5 06	305 90%
6 38	1 25	4 88	291.40%
6 4	1 25	4.7	277 00%
6 42	1 25	4 52	262 70%
6 44	1.25	4 35	248 40%
6 45	1 25	4.26	241 40%
6 46	1 25	4 17	234.30%
6 47	1 25	4 08	227 30%
6 48	1.25	4	220.30%
6 49	1 25	3 91	213 30%
6 5	1 25	3 82	206 30%
6 51	1 25	3 73	199 40%
6 52	1.25	3 65	192 50%
6 53	1 25	3.56	185 60%
6 54	1 25	3 48	178.70%
6 56	1 25	3 31	165 10%
6 58	1 25	3 14	151 50%
6 6	1 25	2.97	138 00%
6 62	1 25	2.8	124 60%
6 64	1 25	2 64	111 30%
6 66	1.25	2.47	98 10%
6 68	1 25	2.31	85 00%
6 7	1.25	2 15	72 00%
6 72	1 25	1 98	59 00%
6 74	1 25	1 82	46 20%

WATERLINE AT ZERO
AREA ERROR = 6 24

INPUT DATA # DATA POINTS= 28

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
S	4	5 75	0	0	0	0	0
G	4 3	6 14	0	0	0	0	0
W	6	6 93	0 1	0 09	0 11	0.01	6 83
	6 5	6.97	0 15	0 35	0 08	0 03	6 82
	7	7 02	0 2	0 43	0 08	0 03	6 82
	7 25	7 13	0 3	0 36	0 08	0 03	6 83
	7 5	7 04	0 2	0 69	0 05	0 03	6 84
	7 75	6 98	0 15	0 89	0 04	0 03	6 83
	8	7 09	0.25	0 64	0 06	0 04	6 84
	8 25	7.01	0 2	0 49	0 05	0 02	6 81
	8 5	7	0.15	0 47	0 04	0 02	6 85
	8.75	7 02	0 2	0 43	0 05	0 02	6 82
	9	7 11	0 3	0.35	0 08	0 03	6.81
	9 25	7 03	0 2	0 47	0 05	0 02	6 83
	9.5	6 98	0.15	0.22	0 04	0 01	6 83
	9 75	6 9	0 1	0 05	0 03	0	6 8
	10	7	0 15	0 17	0 04	0 01	6 85
	10 25	6 95	0 15	0 29	0 04	0 01	6 8
	10 5	6 98	0.15	0 34	0 04	0.01	6 83
	10 75	6 97	0 15	0 23	0 04	0 01	6.82
	11	6 89	0 1	0 08	0 04	0	6 79
	11 5	6 9	0 1	0 06	0 05	0	6 8
	12	6 95	0 15	0 54	0 08	0 04	6 8
	12 5	6 99	0 15	0 28	0 08	0 02	6 84
	13	6 94	0.1	0 03	0 05	0	6 84
W	13 5	6 84	0	0	0	0	0
G	14	6 14	0	0	0	0	0
S	19	5 56	0	0	0	0	0
				TOTALS	1.25	0 43	


Cottonwood Creek
CROSS SECTION DATA ANALYSIS
VERTICAL DEPTH (FT)
DISTANCE FROM STAKE (FT)
Channel Bottom
Computed Water Line

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek - Upper | CROSS-SECTION NO: 1

CROSS-SECTION LOCATION: Near Tabeguache Trail Crossing

DATE: 6-18-03 | OBSERVERS: R. Smith, D. Murphy

LEGAL DESCRIPTION | ¼ SECTION: NE NE | SECTION: 26 | TOWNSHIP: 49 (N)/S | RANGE: 14 E/(W) | PM: N.M.

COUNTY: Montrose/Mesa | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699

MAP(S) | USGS: Cottonwood Basin 7.5' | UTM: 12 S | 0727434 | 4263017 | 8080 ft.

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

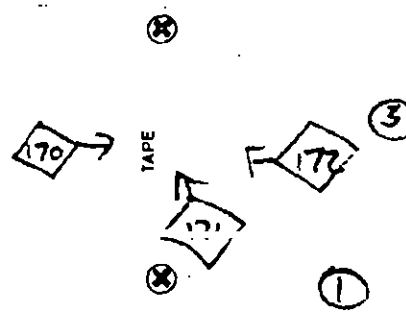
CHANNEL BED MATERIAL SIZE RANGE: gravel to 6" cobbles | PHOTOGRAPHS TAKEN (YES)/NO | NUMBER OF PHOTOGRAPHS: 3

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	6.51 / 6.52
② WS Upstream	8.0	6.46
③ WS Downstream	8.0	6.67

SLOPE | 0.21 / 16.0 = 0.013125

SKETCH



AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED (YES)/NO | DISTANCE ELECTROFISHED ____ ft | FISH CAUGHT (YES)/NO | WATER CHEMISTRY SAMPLED (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL
see attached survey																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME

mayfly, caddisfly

COMMENTS

pH = 8.3 Cond = 50 Stream Temp = 15° C

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Cottonwood Creek - upper | CROSS-SECTION NO: 1 | DATE: 6-18-03 | SHEET 1 OF 1

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading ____ ft | TIME 1:20

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	0.0		4.91								
G	2.0		5.64								
	5.0		6.26								
W	5.5		6.52	0					(0)		
	5.75		6.54	.05					0		
	9.00		6.53	.05					0		
	9.25		6.51	0					0		
	9.50		6.56	.05					0		
	9.75		6.58	.05					0.13		
	10.00		6.70	.20					0.17		
	10.25		6.71	.20					0.32		
	10.50		6.69	.20					0.41		
	10.75		6.74	.25					0.59		
	11.00		6.73	.25					0.61		
	11.25		6.80	.30					0.32		
	11.50		6.70	.20					0.22		
	11.75		6.76	.25					0.15		
	12.00		6.78	.25					0.30		
	12.25		6.83	.30					0.28		
	12.50		6.74	.25					0.48		
	12.75		6.59	.10					0.64		
	13.00		6.61	.10					0.61		
	13.25		6.64	.10					0.91		
	13.50		6.63	.10					0.80		
	13.75		6.68	.15					0.57		
	14.00		6.72	.20					0.61		
	14.25		6.66	.15					0.41		
	14.50		6.61	.15					0.44		
	14.75		6.74	.25					0.39		
	15.00		6.74	.25					0.38		
	15.25		6.63	.10					0.30		
	15.50		6.67	.18					0.35		
	15.75		6.60	.10					0		
	16.0		6.59	10					0.36		
	16.5		1.72	.20					0.21		
	17.0		6.59	.10					0.06		
W	17.5		6.51	0							
G	20.2		5.66								
S	22.0		5.40								

TOTALS

End of Measurement | Time | 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	Cottonwood Creek
XS LOCATION	1
XS NUMBER	1
DATE	6/18/03
OBSERVERS:	Smith and Murphy
1/4 SEC	NE NE
SECTION	26
TWP	49N
RANGE	14W
PM	N M
COUNTY	Montrose
WATERSHED	Gunnison
DIVISION	4
DOW CODE	39699
USGS MAP	Cottonwood Basin 7.5' quad
USFS MAP	

SUPPLEMENTAL DATA

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

TAPE WT	0.0001
TENSION	99999

CHANNEL PROFILE DATA

SLOPE	0.013125

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

ASSIGNED TO . . . . DATE . .

SUMMARY SHEET

MEASURED FLOW (Qm)=	0 5 cfs
CALCULATED FLOW (Qc)=	0 49 cfs
(Qm-Qc)/Qm * 100 =	1 3 %
MEASURED WATERLINE (WLm)=	6 52 ft
CALCULATED WATERLINE (WLc)=	6.51 ft
(WLm-WLc)/WLm * 100 =	0 1 %
MAX MEASURED DEPTH (Dm)=	0 3 ft
MAX CALCULATED DEPTH (Dc)=	0 32 ft
(Dm-Dc)/Dm * 100	-7 7 %
MEAN VELOCITY=	0.36 ft/sec
MANNING'S N=	0 131
SLOPE=	0 013125 ft/ft
4 * Qm =	0 2 cfs
2 5 * Qm=	1 2 cfs

RECOMMENDED INSTREAM FLOW

FLOW (CFS)	PERIOD
0.88	winter

RATIONALE FOR RECOMMENDATION

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

CWCB REVIEW BY . . . . . DATE . .

STREAM NAME	Cottonwood Creek
XS LOCATION	1
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)
	5.68	18.01	0.74	1.15	13.24	18.45	100.00%	0.72	13.74	1.04
	5.71	17.79	0.72	1.12	12.75	18.22	98.80%	0.7	13.02	1.02
	5.76	17.38	0.68	1.07	11.87	17.81	96.50%	0.67	11.74	0.99
GL	5.81	16.98	0.65	1.02	11.01	17.39	94.30%	0.63	10.52	0.96
	5.86	16.57	0.61	0.97	10.18	16.97	92.00%	0.6	9.37	0.92
	5.91	16.17	0.58	0.92	9.36	16.56	89.70%	0.57	8.29	0.89
	5.96	15.77	0.54	0.87	8.56	16.14	87.50%	0.53	7.26	0.85
	6.01	15.36	0.51	0.82	7.78	15.72	85.20%	0.49	6.31	0.81
	6.06	14.96	0.47	0.77	7.02	15.3	83.00%	0.46	5.41	0.77
	6.11	14.55	0.43	0.72	6.29	14.89	80.70%	0.42	4.58	0.73
	6.16	14.15	0.39	0.67	5.57	14.47	78.40%	0.38	3.81	0.69
	6.21	13.74	0.35	0.62	4.87	14.05	76.20%	0.35	3.11	0.64
	6.26	13.34	0.31	0.57	4.19	13.63	73.90%	0.31	2.47	0.59
	6.31	12.53	0.28	0.52	3.55	12.82	69.50%	0.28	1.95	0.55
	6.36	11.69	0.25	0.47	2.94	11.97	64.90%	0.25	1.49	0.51
	6.41	10.86	0.22	0.42	2.38	11.13	60.30%	0.21	1.1	0.46
	6.46	10.02	0.19	0.37	1.85	10.28	55.70%	0.18	0.77	0.41
	6.51	9.19	0.15	0.32	1.37	9.44	51.10%	0.15	0.49	0.36
	6.56	7.72	0.12	0.27	0.96	7.96	43.10%	0.12	0.3	0.32
	6.61	6.55	0.09	0.22	0.6	6.77	36.70%	0.09	0.15	0.26
WL	6.66	4.64	0.07	0.17	0.31	4.8	26.00%	0.06	0.06	0.21
	6.71	2.68	0.04	0.12	0.12	2.76	15.00%	0.04	0.02	0.16
	6.76	1.04	0.03	0.07	0.03	1.07	5.80%	0.03	0	0.12
	6.81	0.18	0.01	0.02	0	0.19	1.00%	0.01	0	0.06

Criteria

Range 0.2 - 1.2 cfs

1) $0.2 \cdot \bar{d}$ = 0.88 cfs

2) 50% WP = 0.46 cfs

3) 1 ft/sec $\bar{v}$ = 12.17 cfs

STREAM NAME: Cottonwood Creek
XS LOCATION: 1
XS NUMBER: 1

INPUT DATA # DATA POINTS= 39 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	4 91	0	0	0	0	0	0	0 00%
G	2	5 64	0	0	0	0	0	0	0 00%
	5	6 26	0	0	0	0	0	0	0 00%
W	8 5	6 52	0	0	0	0	0	0	0.00%
	8 75	6 54	0 05	0	0.25	0 05	0 01	0	0 00%
	9	6 53	0 05	0	0 25	0 05	0 01	0	0 00%
	9 25	6.51	0	0	0 25	0	0	0	0 00%
	9 5	6 56	0 05	0	0 25	0 05	0 01	0	0 00%
	9 75	6 58	0.05	0 13	0 25	0 05	0 01	0	0 30%
	10	6 7	0 2	0 17	0 28	0 2	0 05	0 01	1 70%
	10 25	6 71	0 2	0 32	0 25	0 2	0 05	0 02	3 20%
	10 5	6 69	0 2	0 41	0 25	0 2	0 05	0 02	4.10%
	10 75	6 74	0 25	0 59	0 25	0 25	0 06	0 04	7 40%
	11	6 75	0 25	0 61	0 25	0 25	0 06	0 04	7 60%
	11 25	6 8	0 3	0 32	0 25	0 3	0.08	0 02	4 80%
	11 5	6 7	0 2	0 22	0 27	0 2	0 05	0 01	2 20%
	11 75	6 76	0 25	0 15	0 26	0 25	0 06	0 01	1 90%
	12	6.78	0 25	0 3	0 25	0 25	0.06	0 02	3 80%
	12 25	6 83	0.3	0 28	0 25	0 3	0 08	0 02	4 20%
	12.5	6 74	0 25	0 48	0 27	0 25	0 06	0 03	6.00%
	12 75	6 59	0 1	0 64	0 29	0.1	0 03	0 02	3 20%
	13	6 61	0 1	0 61	0 25	0 1	0 03	0 02	3 10%
	13 25	6 64	0 1	0 91	0 25	0 1	0 03	0 02	4 60%
	13 5	6 63	0 1	0 8	0 25	0 1	0 03	0 02	4 00%
	13 75	6 68	0 15	0 57	0.25	0 15	0 04	0 02	4 30%
	14	6 72	0.2	0 61	0 25	0 2	0 05	0 03	6 10%
	14 25	6 66	0 15	0 41	0 26	0 15	0 04	0 02	3 10%
	14 5	6 64	0 15	0.44	0 25	0 15	0 04	0 02	3 30%
	14 75	6 74	0 25	0 39	0 27	0 25	0 06	0 02	4 90%
	15	6 74	0 25	0.38	0 25	0 25	0 06	0 02	4 80%
	15 25	6 63	0 1	0 3	0 27	0.1	0 03	0 01	1 50%
	15 5	6 67	0 15	0 35	0 25	0 15	0 04	0 01	2 60%
	15 75	6 6	0 1	0	0 26	0 1	0 03	0	0 00%
	16	6 59	0 1	0 36	0 25	0 1	0 04	0 01	2 70%
	16 5	6 72	0 2	0 21	0 52	0 2	0 1	0 02	4 20%
	17	6 59	0 1	0 06	0 52	0 1	0 05	0	0 60%
W	17 5	6 51	0	0	0 51	0	0	0	0 00%
G	20 2	5.68	0	0	0	0	0	0	0 00%
S	22	5 4	0	0	0	0	0	0	0.00%
TOTALS ----------					9.25	0 3 (Max)	1 38	0.5	100 00%

Manning's n = 0 1314

STREAM NAME: Cottonwood Creek
XS LOCATION: 1
XS NUMBER: 1

PROOF SHEET

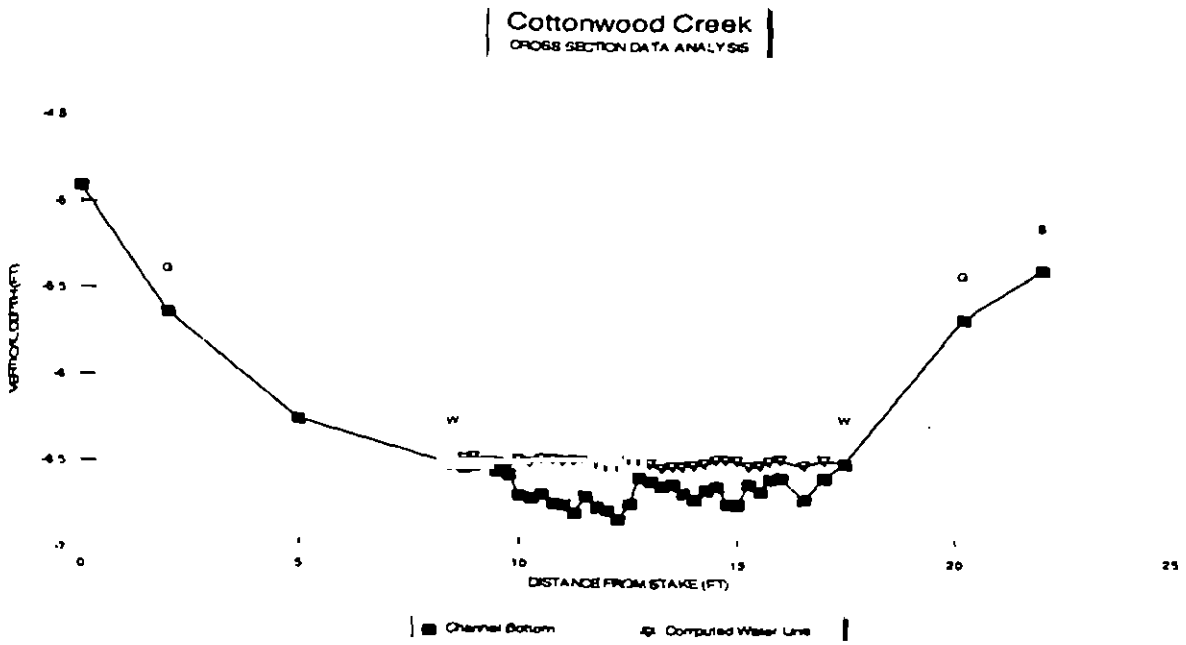
WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
6 27	1.38	4 09	197 20%
6 29	1 38	3 83	178.20%
6 31	1 38	3 57	159 70%
6 33	1.38	3 32	141 70%
6 35	1 38	3 08	124 10%
6 37	1 38	2 85	107.10%
6 39	1.38	2 62	90 50%
6 41	1.38	2 4	74 40%
6 43	1 38	2 18	58 80%
6 45	1 38	1 98	43.70%
6 47	1.38	1.77	29 10%
6 48	1 38	1 68	22 00%
6 49	1.38	1 58	14 90%
6 5	1 38	1 49	8 10%
6 51	1 38	1 39	1 30%
6 52	1.38	1 3	-5 30%
6 53	1 38	1 21	-11 70%
6 54	1 38	1 13	-17 80%
6.55	1 38	1 05	-23 60%
6 56	1 38	0 97	-29.30%
6 57	1 38	0 9	-34 80%
6 59	1 38	0 75	-45 60%
6 61	1.38	0 61	-55 80%
6 63	1 38	0 48	-65 00%
6 65	1 38	0 37	-73 30%
6 67	1.38	0 27	-80.10%
6 69	1 38	0 19	-86 00%
6 71	1 38	0 12	-90 90%
6 73	1 38	0 08	-94 30%
6 75	1 38	0 04	-96 80%
6 77	1 38	0 02	-98 40%

WATERLINE AT ZERO
AREA ERROR = 6 507

INPUT DATA # DATA POINTS= 39

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
S	0	4 91	0	0	0	0	0
G	2	5 64	0	0	0	0	0
	5	6.26	0	0	0	0	0
W	8 5	6 52	0	0	0	0	0
	8 75	6 54	0 05	0	0 01	0	6 49
	9	6 53	0 05	0	0 01	0	6 48
	9 25	6 51	0	0	0	0	0
	9 5	6.56	0 05	0	0 01	0	6 51
	9 75	6 58	0 05	0 13	0 01	0	6 53
	10	6 7	0.2	0 17	0.05	0 01	6 5
	10.25	6.71	0 2	0 32	0 05	0 02	6 51
	10 5	6 69	0 2	0 41	0.05	0 02	6 49
	10 75	6 74	0 25	0 59	0 06	0 04	6 49
	11	6 75	0 25	0 61	0 06	0 04	6 5
	11 25	6 8	0 3	0 32	0 08	0 02	6.5
	11.5	6 7	0 2	0 22	0 05	0 01	6 5
	11 75	6 76	0.25	0 15	0.06	0 01	6 51
	12	6 78	0 25	0 3	0 06	0 02	6 53
	12 25	6 83	0.3	0 28	0 08	0 02	6 53
	12 5	6 74	0.25	0 48	0 06	0.03	6 49
	12.75	6 59	0 1	0 64	0 03	0 02	6 49
	13	6 61	0 1	0 61	0.03	0 02	6 51
	13 25	6 64	0 1	0 91	0 03	0 02	6 54
	13 5	6 63	0 1	0 8	0 03	0 02	6.53
	13 75	6 68	0 15	0 57	0.04	0 02	6 53
	14	6 72	0 2	0 61	0 05	0 03	6 52
	14 25	6 66	0 15	0 41	0 04	0 02	6 51
	14 5	6 64	0 15	0 44	0 04	0 02	6 49
	14 75	6 74	0 25	0 39	0 06	0 02	6 49
	15	6 74	0 25	0 38	0 06	0 02	6 49
	15 25	6 63	0 1	0 3	0 03	0 01	6 53
	15 5	6 67	0 15	0 35	0 04	0 01	6 52
	15 75	6 6	0 1	0	0 03	0	6 5
	16	6 59	0 1	0 36	0.04	0 01	6 49
	16 5	6 72	0 2	0 21	0 1	0 02	6 52
	17	6.59	0 1	0.06	0 05	0	6 49
W	17 5	6 51	0	0	0	0	0
G	20.2	5.68	0	0	0	0	0
S	22	5 4	0	0	0	0	0
				TOTALS	1 38	0 5	


Cottonwood Creek
CROSS SECTION DATA ANALYSIS
VERTICAL DEPTH (FT)
DISTANCE FROM STAKE (FT)
0
5
10
15
20
25
Channel Bottom
Computed Water Line

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek - Upper

CROSS-SECTION NO.: 1

CROSS-SECTION LOCATION: At Cottonwood Creek Road

DATE: 6-16-05 OBSERVERS: R. Smith, D. Smith

LEGAL DESCRIPTION: ¼ SECTION: NE NE | SECTION: 26 | TOWNSHIP: 49 (N) S | RANGE: 14 E (W) | PM: N.M

COUNTY: Montrose/Mesa | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699

MAP(S): USGS: Cottonwood Basin 7.5' | USFS:

Zone 12 0727378 Elev. 8000 ft. 4263519

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

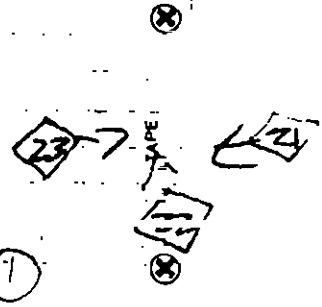
CHANNEL BED MATERIAL SIZE RANGE: 3" cobbles to 1-foot boulders | PHOTOGRAPHS TAKEN: (YES) NO | NUMBER OF PHOTOGRAPHS: 3

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	00	7.13 / 7.05
②	WS Upstream	14.0	6.90
③	WS Downstream	14.0	7.56

SLOPE: 0.66/28.0' = 0.02357

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 previous survey																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME

mayfly, stonefly, caddisfly

COMMENTS

Ph = 8.1 TDS = 30 Temp = 58° F

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Cottonwood Creek | CROSS-SECTION NO 1 | DATE 6-16-05 | SHEET __ OF __

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading 0.2 ft | TIME 2:20

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)
RS		24.0		5.30								
G		20.0		6.43								
W		18.0		7.06	Ø				Ø			
		17.0		7.44	0.35				1.23			
2	15.5	16.0	7.10	7.58	0.50				1.64			
		15.0		7.58	0.50				1.77			
		14.0		7.70	0.65				1.02			
		13.5		7.57	0.30				1.23			
		13.0		7.30	0.25				0.76			
		12.5		7.56	0.50				0.84			
		12.0		7.26	0.20				0.90			
		11.0		7.43	0.30				1.28			
		10.0		7.56	0.45				0.01			
		9.0		7.51	0.35				0.56			
		8.0		7.36	0.20				0.82			
		7.0		7.47	0.30				0.26			
		6.0		7.42	0.30				0.55			
		5.0		7.56	0.45				1.22			
		4.0		7.34	0.20				Ø			
W		3.5		7.13	Ø							
G		1.0		6.53								
LS		0.0		5.99								

TOTALS:

End of Measurement | Time 2:30 | Gage Reading 0.2 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	Cottonwood Creek
XS LOCATION	Cottonwood Creek Road
XS NUMBER	1
DATE:	16-Jun-05
OBSERVERS:	R Smith, D Smith
1/4 SEC	NE
SECTION	26
TWP	49N
RANGE	14W
PM	NM
COUNTY	Montrose/Mesa
WATERSHED	Gunnison
DIVISION:	4
DOW CODE	39699
USGS MAP	Cottonwood Basin 7 5'
USFS MAP:	0

SUPPLEMENTAL DATA

TAPE WT:	0 0106
TENSION	99999

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

CHANNEL PROFILE DATA

SLOPE: 0 023

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

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

STREAM NAME Cottonwood Creek
XS LOCATION Cottonwood Creek Road
XS NUMBER 1

DATA POINTS= 22

VALUES COMPUTED FROM RAW FIELD DATA

FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
LS	0 00	5 99			0 00		0 00	0 00	0 0%
1 G	1 00	6 53			0 00		0 00	0 00	0 0%
W	3 50	7 13	0 00	0 00	0 00		0.00	0 00	0 0%
	4 00	7.34	0 20	1 22	0 54	0 20	0 15	0 18	4 9%
	5.00	7 56	0.45	0 55	1.02	0 45	0 45	0 25	6 6%
	6 00	7 42	0 30	0.26	1 01	0 30	0 30	0 08	2 1%
	7 00	7 47	0 30	0 82	1 00	0 30	0 30	0.25	6.5%
	8 00	7 36	0 20	0 56	1.01	0 20	0 20	0 11	3 0%
	9 00	7.51	0 35	0 01	1 01	0 35	0 35	0 00	0 1%
	10 00	7 56	0 45	1 28	1 00	0 45	0 45	0 58	15 3%
	11.00	7 43	0 30	0 90	1 01	0 30	0 30	0 27	7 2%
	12 00	7.26	0.20	0 84	1.01	0 20	0 15	0 13	3.3%
	12 50	7.56	0 50	0.76	0 58	0 50	0 25	0 19	5 0%
	13.00	7 30	0 25	1 23	0 56	0 25	0 13	0 15	4 1%
	13 50	7 57	0 50	1 02	0.57	0 50	0 25	0 26	6 8%
	14 00	7 70	0 65	1 77	0 52	0.65	0.49	0.86	22 9%
	15 00	7 58	0.50	0 00	1.01	0 50	0 38	0 00	0 0%
R	15 50	7 10	0 00	1 64	0 69		0 00	0 00	0 0%
	16 00	7 58	0 50	1 23	0 69	0 50	0 38	0 46	12 3%
	17 00	7 44	0 35	0 00	1 01	0 35	0.35	0 00	0 0%
W	18 00	7 06	0 00		1.07		0 00	0.00	0.0%
1 G	20 00	6.43			0 00		0 00	0 00	0 0%
TOTALS					15.32	0 65 (Max)	4 86	3 76	100 0%

Manning's n = 0 1354
Hydraulic Radius= 0 317335729

STREAM NAME Cottonwood Creek
XS LOCATION Cottonwood Creek Road
XS NUMBER 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	4 86	4 76	-2 1%
6 87	4 86	8 59	76 6%
6 89	4 86	8 26	69.9%
6 91	4 86	7 94	63 4%
6.93	4 86	7.63	56 8%
6 95	4 86	7 31	50 4%
6 97	4 86	7.00	44 0%
6 99	4 86	6 69	37.6%
7 01	4.86	6 39	31 4%
7 03	4 86	6.08	25 1%
7 05	4 86	5 79	19.0%
7.07	4 86	5.49	12 9%
7.08	4 86	5 34	9.9%
7 09	4.86	5.20	6 8%
7 10	4.86	5 05	3 8%
7 11	4 86	4.90	0 9%
7 12	4 86	4.76	-2.1%
7 13	4 86	4 62	-5.1%
7 14	4 86	4.47	-8.0%
7 15	4 86	4 33	-10.9%
7 16	4.86	4 19	-13.8%
7 17	4.86	4 05	-16 7%
7 19	4 86	3.77	-22 4%
7 21	4 86	3 50	-28.1%
7.23	4 86	3 22	-33 7%
7.25	4 86	2.95	-39 3%
7 27	4 86	2.69	-44 8%
7 29	4 86	2 42	-50.2%
7.31	4 86	2.17	-55 4%
7.33	4.86	1.92	-60 6%
7 35	4.86	1.68	-65 5%
7.37	4 86	1 44	-70 3%

WATERLINE AT ZERO
AREA ERROR = 7 108

STREAM NAME Cottonwood Creek
XS LOCATION Cottonwood Creek Road
XS NUMBER 1 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"	6 53	18 68	0 77	1 17	14 43	19 66	100 0%	0 73	19 55	1 35
	6 56	18 48	0 75	1 14	13 92	19 45	98 9%	0 72	18 53	1 33
	6 61	18 11	0 72	1 09	13 00	19 07	97 0%	0 68	16 76	1 29
	6 66	17 74	0 68	1 04	12 10	18 68	95 0%	0 65	15 08	1 25
	6 71	17 38	0 65	0 99	11 23	18 30	93 1%	0 61	13 49	1 20
	6 76	17 01	0 61	0 94	10 37	17 92	91 2%	0 58	11 98	1 16
	6 81	16 64	0 57	0 89	9 53	17 54	89 2%	0 54	10 55	1 11
	6 86	16 28	0 53	0 84	8 70	17 16	87 3%	0 51	9 21	1 06
	6 91	15 91	0 50	0 79	7 90	16 78	85 4%	0 47	7 95	1 01
	6 96	15 54	0 46	0 74	7 11	16 40	83 4%	0 43	6 78	0 95
	7 01	15 17	0 42	0 69	6 34	16 02	81 5%	0 40	5 69	0 90
	7 06	14 81	0 38	0 64	5 59	15 64	79 6%	0 36	4 69	0 84
"WL"	7 11	14 45	0 34	0 59	4 86	15 26	77 6%	0 32	3 78	0 78
	7 16	14 06	0 30	0 54	4 15	14 81	75 3%	0 28	2 96	0 71
	7 21	13 70	0 25	0 49	3 46	14 39	73 2%	0 24	2 22	0 64
	7 26	13 35	0 21	0 44	2 78	13 98	71 1%	0 20	1 58	0 57
	7 31	12 60	0 17	0 39	2 13	13 15	66 9%	0 16	1 05	0 49
	7 36	11 64	0 13	0 34	1 52	12 09	61 5%	0 13	0 64	0 42
	7 41	9 86	0 10	0 29	0 99	10 21	51 9%	0 10	0 35	0 35
	7 46	6 88	0 08	0 24	0 56	7 12	36 2%	0 08	0 17	0 31
	7 51	4 49	0 06	0 19	0 28	4 64	23 6%	0 06	0 07	0 26
	7 56	1 82	0 07	0 14	0 12	1 87	9 5%	0 07	0 03	0 27
	7 61	1 12	0 05	0 09	0 05	1 14	5 8%	0 05	0 01	0 21
	7 66	0 51	0 02	0 04	0 01	0 52	2 7%	0 02	0 00	0 13

1 ft/ps = 0.97

STREAM NAME	Cottonwood Creek
XS LOCATION	Cottonwood Creek Road
XS NUMBER	1

SUMMARY SHEET

MEASURED FLOW (Qm)=	3 76	cfs
CALCULATED FLOW (Qc)=	3 78	cfs
(Qm-Qc)/Qm * 100 =	-0 3	%
MEASURED WATERLINE (WLm)=	7 12	ft
CALCULATED WATERLINE (WLc)=	7 11	ft
(WLm-WLc)/WLm * 100 =	0 1	%
MAX MEASURED DEPTH (Dm)=	0 65	ft
MAX CALCULATED DEPTH (Dc)=	0 59	ft
(Dm-Dc)/Dm * 100	8 9	%
MEAN VELOCITY=	0 78	ft/sec
MANNING'S N=	0 135	
SLOPE=	0 023	ft/ft
4 * Qm =	1 5	cfs
2 5 * Qm=	9 4	cfs

RECOMMENDED INSTREAM FLOW

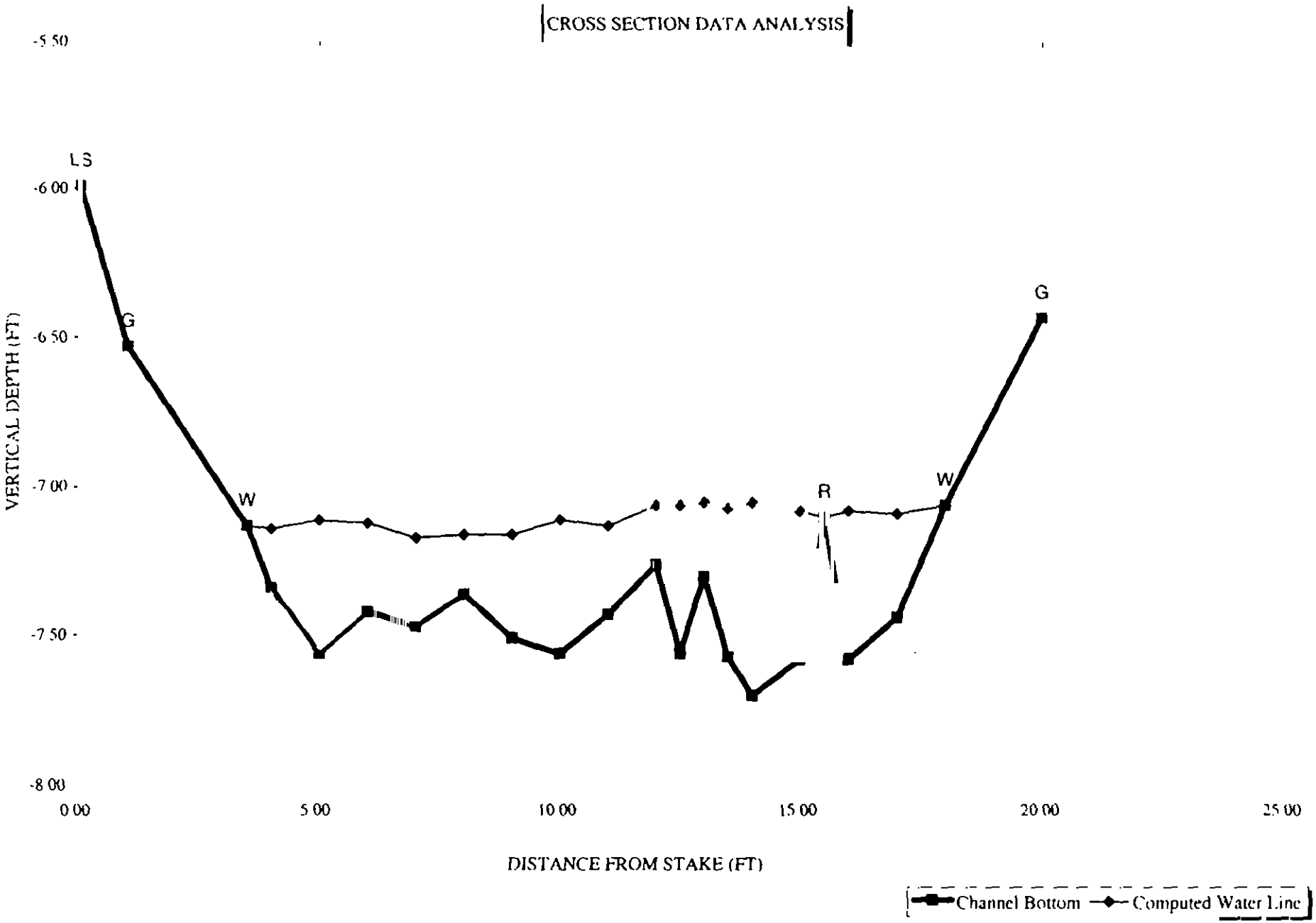
FLOW (CFS)	PERIOD

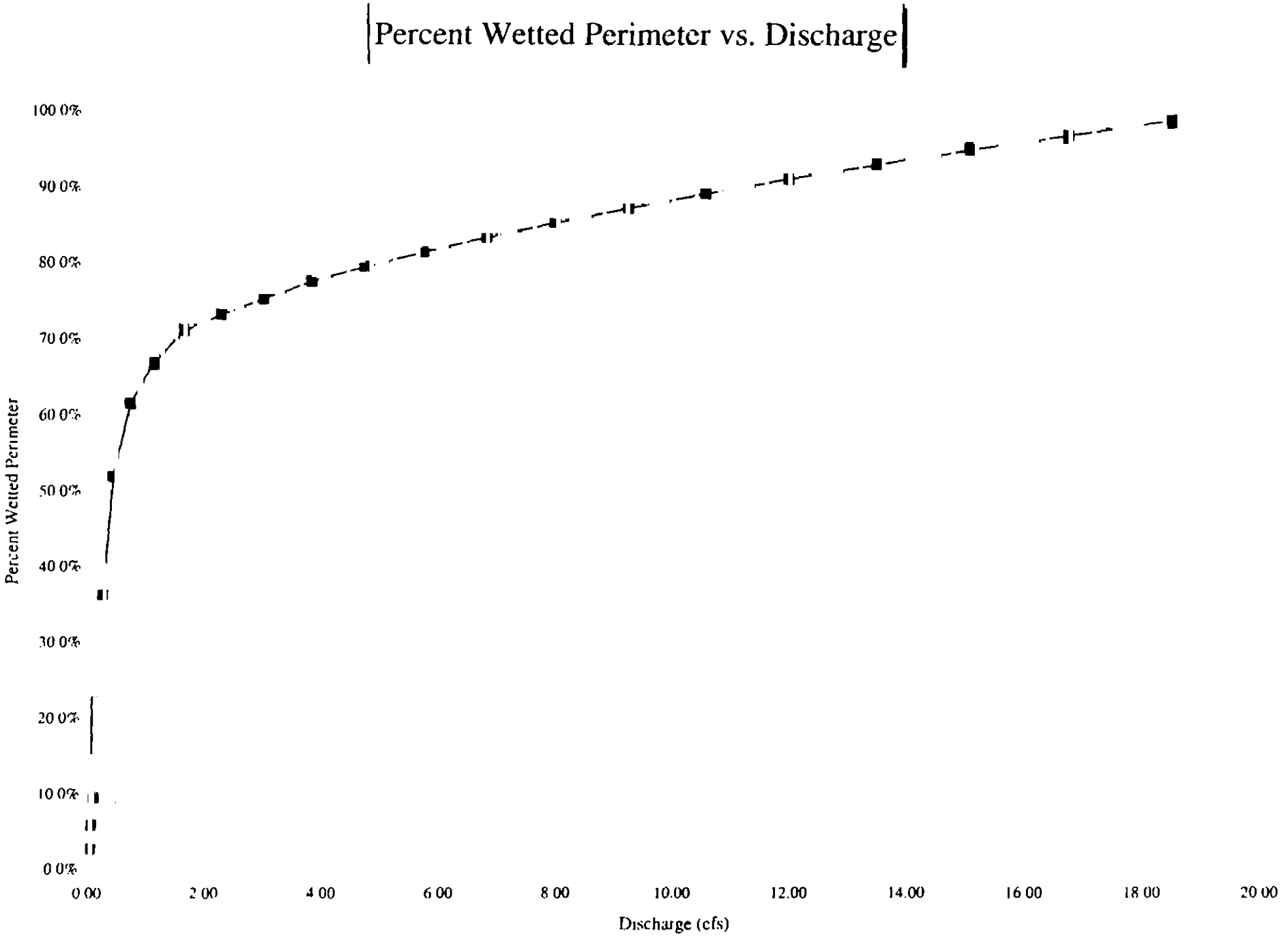
RATIONALE FOR RECOMMENDATION

RECOMMENDATION BY AGENCY DATE

CWCB REVIEW BY DATE

Cottonwood Creek




Percent Wetted Perimeter vs. Discharge
100 0%
90 0%
80 0%
70 0%
60 0%
50 0%
40 0%
30 0%
20 0%
10 0%
0 0%
Percent Wetted Perimeter
0 00
2 00
4 00
6 00
8 00
10.00
12.00
14.00
16 00
18 00
20 00
Discharge (cfs)

COTTNWOD. WICI
COTTNWOL. PSC

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek - Lower | CROSS-SECTION NO: 1

CROSS SECTION LOCATION: At "narrows" feature on 1980 map ≈ 6 miles upstream from confluence with Roubideau Creek

DATE: 6-3-98 | OBSERVERS: R. Smith, D. Smith, O. Murphy

LEGAL DESCRIPTION: ¼ SECTION: SW NW | SECTION: 27 | TOWNSHIP: 51 (N) S | RANGE: 12 E (W) PM: New Mex.

COUNTY: Delta | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699

MAP(S): USGS: Roubideau, CO | USFS:

SUPPLEMENTAL DATA

TAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES) NO | METER TYPE: Marsh-McBirney

METER NUMBER: | DATE RATED: | CAL/SPIN: ____ sec | TAPE WEIGHT: surveyed ____ lbs/100' | TAPE TENSION: ____ lbs

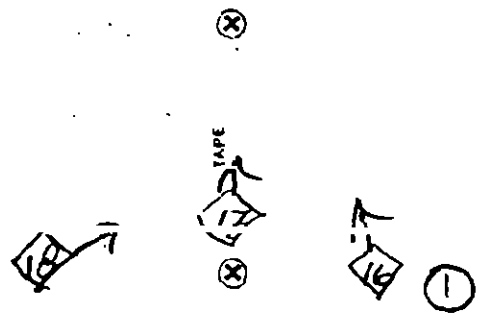
CHANNEL BED MATERIAL SIZE RANGE: gravel to 1' foot boulders | PHOTOGRAPHS TAKEN: (YES) NO | NUMBER OF PHOTOGRAPHS: 3

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	6.25 / 6.25
② WS Upstream	15.0'	6.10
③ WS Downstream	15.0'	6.45

SLOPE: 0.35' / 30.0' = 0.01167

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 form																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME

leeches, blackflies, caddis flies

COMMENTS

Beaver activity - many fish residing in beaver ponds.

Flows were well past spring peak - early snowmelt and no precip during previous month.

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Cottonwood Creek | CROSS-SECTION NO: 1 | DATE 6-3-98 | SHEET 1 OF 1

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading: 0.2 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) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
0 RS	0.9		4.90								
G	2.3		5.18								
	4.1		5.60								
W	5.6	0.5	6.25	0							
	6.6	1.0	6.35	0.10				0.90		0.10	0.0900
	7.6	1.0	6.50	0.30				1.60		0.30	0.4800
	8.6	1.0	6.55	0.25				1.82		0.25	0.4550
	9.6	1.0	6.50	0.25				2.04		0.25	0.5100
	10.6	1.0	6.55	0.15				1.20		0.15	0.1800
10	11.6	1.0	6.65	0.25				2.05		0.25	0.5125
	12.6	1.0	6.60	0.25				1.70		0.25	0.4250
	13.6	1.0	6.57	0.30				1.80		0.30	0.5400
	14.6	1.0	6.60	0.30				1.51		0.30	0.4530
	15.6	1.0	6.55	0.15				1.22		0.15	0.1830
	16.6	1.0	6.55	0.20				1.02		0.20	0.2040
	17.6	1.0	6.50	0.25				0.97		0.25	0.2425
	18.6	1.0	6.75	0.55				1.53		0.35	0.5355
	19.6	0.75	6.40	0.15				0.57		0.112	0.0638
W	20.1	0.25	6.25	0							
0 G	23.5		5.0								
1 LS	24.5		4.45								

TOTALS 14.5 | 3.212 | 4.8743

End of Measurement | Time 1:30 | Gage Reading 0.2 ft | CALCULATIONS PERFORMED BY | CALCULATIONS CHECKED BY:

PROOF SHEET

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek
XS LOCATION: At "Narrows" feature on topo map, ab
XS NUMBER: 1

DATE: 06-03-98
OBSERVERS: R Smith, D Smith, D Murphy

1/4 SEC: SW NW
SECTION: 27
TWP: 51 N
RANGE: 12 W
PM: N M.

COUNTY: Delta
WATERSHED: Gunnison
DIVISION: 4
DOW CODE: 39699

USGS MAP: Roubideau
USFS MAP

SUPPLEMENTAL DATA

TAPE WT. 0 0001
TENSION 99999

CHANNEL PROFILE DATA

SLOPE: 0.01167

INPUT DATA # DATA POINTS= 21

FEATURE		DIST	VERT DEPTH	WATER DEPTH	VEL	A	Q	TAPE TO WATER
S		0 90	4.90	0 00	0.00	0.00	0 00	0.00
1 G		2.30	5 10	0.00	0.00	0 00	0 00	0 00
		4 10	5 60	0 00	0 00	0 00	0.00	0.00
W		5.60	6.25	0 00	0 00	0 00	0.00	0.00
		6 60	6.35	0 10	0 90	0 10	0.09	6.25
		7.60	6.50	0 30	1 60	0 30	0.48	6 20
		8.60	6.55	0.25	1 82	0 25	0.46	6 30
		9 60	6.50	0.25	2 04	0.25	0 51	6 25
		10 60	6 55	0 15	1.20	0 15	0 18	6 40
		11 60	6 65	0 25	2.05	0.25	0 51	6 40
		12 60	6.60	0 25	1 70	0.25	0 43	6 35
		13.60	6.57	0 30	1 80	0 30	0 54	6 27
		14 60	6.60	0 30	1 51	0 30	0 45	6 30
		15 60	6.55	0 15	1 22	0 15	0 18	6 40
		16.60	6 55	0.20	1 02	0 20	0 20	6 35
		17.60	6 50	0.25	0 97	0 25	0.24	6 25
		18.60	6.75	0.35	1 53	0.35	0.54	6 40
		19.60	6.40	0 15	0 57	0 11	0.06	6.25
W		20 10	6 25	0 00	0 00	0.00	0 00	0.00
1 G		23.50	5.00	0 00	0 00	0.00	0 00	0 00
S		24.50	4 45	0 00	0.00	0 00	0 00	0 00
	TOTALS					3 21	4.87	

CHECKED BY: B. Carey ... DATE 10/7/98

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

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

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek
XS LOCATION At "narrows" feature on topo map, about 6mi. US from Roubideau Ck.
XS NUMBER 1

DATE: 06-03-98
OBSERVERS R. Smith, D Smith, D. Murphy

1/4 SEC: SW NW
SECTION: 27
TWP: 51 N
RANGE: 12 W
PM: N M.

COUNTY: Delta
WATERSHED: Gunnison
DIVISION: 4
DOW CODE: 39699

USGS MAP: Roubideau
USFS MAP:

SUPPLEMENTAL DATA

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

TAPE WT: 0.0001
TENSION: 99999

CHANNEL PROFILE DATA

SLOPE: 0.0116

INPUT DATA CHECKED BY: Bill Carey DATE: 10/7/98

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

STREAM NAME: Cottonwood Creek
XS LOCATION: At "narrows" feature on topo map, about 6mi US from Roubideau Ck
XS NUMBER: 1

	INPUT DATA	# DATA POINTS= 21			VALUES COMPUTED FROM RAW FIELD DATA				
	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	S	0.90	4.90	0.00	0 00	0 00	0.00	0 00	0 00	0.0%
1	G	2.30	5.18	0 00	0 00	0 00	0 00	0 00	0 00	0 0%
		4.10	5.60	0 00	0.00	0 00	0 00	0 00	0 00	0 0%
	W	5.60	6 25	0.00	0.00	0 00	0 00	0.00	0 00	0 0%
		6.60	6 35	0.10	0 90	1 00	0 10	0.10	0 09	1 8%
		7 60	6.50	0 30	1 60	1.01	0 30	0.30	0.48	9.8%
		8 60	6.55	0 25	1.82	1.00	0 25	0 25	0 46	9.3%
		9 60	6 50	0 25	2.04	1.00	0 25	0 25	0 51	10.5%
		10.60	6 55	0 15	1.20	1 00	0 15	0 15	0.18	3 7%
		11 60	6.65	0 25	2 05	1.00	0 25	0 25	0 51	10 5%
		12.60	6.60	0 25	1 70	1 00	0.25	0 25	0.43	8.7%
		13 60	6 57	0.30	1 80	1 00	0 30	0 30	0.54	11 1%
		14.60	6.60	0.30	1 51	1.00	0.30	0 30	0 45	9 3%
		15.60	6 55	0.15	1.22	1.00	0 15	0 15	0 18	3 8%
		16.60	6 55	0 20	1.02	1 00	0.20	0.20	0 20	4.2%
		17 60	6 50	0.25	0.97	1 00	0.25	0 25	0.24	5.0%
		18 60	6 75	0 35	1.53	1.03	0 35	0 35	0 54	11 0%
		19 60	6.40	0 15	0.57	1 06	0 15	0 11	0 06	1 3%
	W	20 10	6.25	0.00	0.00	0 52	0.00	0.00	0.00	0.0%
1	G	23.50	5 00	0 00	0 00	0 00	0 00	0.00	0.00	0 0%
	S	24.50	4 45	0 00	0 00	0 00	0.00	0.00	0 00	0.0%
		TOTALS				14 64	0 35 (Max.)	3 21	4 87	100.0%

Manning's n = 0 0385

STREAM NAME: Cottonwood Cre
XS LOCATION At "narrows" f
XS NUMBER: 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
6.00	3.21	7.86	144.8%
6.02	3.21	7.55	135.0%
6.04	3.21	7.24	125.3%
6.06	3.21	6.93	115.7%
6.08	3.21	6.62	106.1%
6.10	3.21	6.31	96.5%
6.12	3.21	6.01	87.1%
6.14	3.21	5.71	77.7%
6.16	3.21	5.41	68.3%
6.18	3.21	5.11	59.1%
6.20	3.21	4.81	49.8%
6.21	3.21	4.67	45.3%
6.22	3.21	4.52	40.7%
6.23	3.21	4.37	36.1%
6.24	3.21	4.23	31.6%
6.25	3.21	4.08	27.1%
6.26	3.21	3.94	22.6%
6.27	3.21	3.80	18.1%
6.28	3.21	3.65	13.7%
6.29	3.21	3.51	9.4%
6.30	3.21	3.37	5.0%
6.32	3.21	3.10	-3.5%
6.34	3.21	2.83	-11.9%
6.36	3.21	2.57	-20.1%
6.38	3.21	2.31	-28.1%
6.40	3.21	2.05	-36.1%
6.42	3.21	1.80	-43.9%
6.44	3.21	1.55	-51.6%
6.46	3.21	1.31	-59.2%
6.48	3.21	1.07	-66.7%
6.50	3.21	0.83	-74.0%

WATERLINE AT ZERO
AREA ERROR = 6.312

STREAM NAME: Cottonwood Creek
XS LOCATION: At "narrows" feature on topo map, about 6mi. US from Roubideau Ck.
XS NUMBER: 1

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 PER (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG VELOCITY (FT/SEC)
"GL"	5.18	20.71	1 09	1 57	22.65	21 23	100.0%	1.07	98 66	4.36
	5 31	19 79	1 01	1 44	19 98	20 26	95.5%	0 99	82 57	4 13
	5.36	19.44	0.98	1.39	19 00	19 90	93 7%	0 95	76.86	4 04
	5.41	19 09	0 95	1 34	18 04	19 53	92.0%	0 92	71 35	3.96
	5.46	18.74	0 91	1.29	17.09	19.17	90.3%	0 89	66 05	3.86
	5.51	18.39	0.88	1.24	16 16	18.80	88 0%	0.86	60 96	3.77
	5.56	18.04	0 85	1.19	15 25	18 44	86.9%	0 83	56.07	3 68
	5.61	17.71	0 81	1.14	14.36	18.10	85.3%	0 79	51 34	3.58
	5 66	17 46	0 77	1 09	13.48	17.83	84 0%	0 76	46 68	3.46
	5 71	17 21	0.73	1.04	12 61	17 56	82 7%	0 72	42.22	3 35
	5 76	16.95	0 69	0 99	11.76	17 28	81 4%	0.68	37.95	3 23
	5 81	16 70	0.65	0 94	10.92	17 01	80 2%	0 64	33 89	3.10
	5 86	16.45	0.61	0.89	10 09	16 74	78 9%	0 60	30 03	2 98
	5.91	16.20	0 57	0 84	9 27	16 47	77 6%	0 56	26.38	2 84
	5.96	15.95	0 53	0 79	8.47	16 20	76 3%	0.52	22 93	2 71
	6.01	15 70	0 49	0 74	7.68	15.93	75.1%	0 48	19 69	2 56
	6 06	15.45	0 45	0.69	6 90	15 66	73 8%	0 44	16.67	2 42
	6 11	15 19	0.40	0 64	6 13	15 39	72 5%	0.40	13 86	2 26
	6.16	14.94	0 36	0 59	5.38	15.12	71 2%	0 36	11 27	2 09
	6 21	14.69	0.32	0 54	4.64	14.85	70.0%	0.31	8 91	1 92
	6.26	14 34	0.27	0.49	3 91	14 48	68 2%	0.27	6 82	1.74
"WL"	6.31	13.68	0.23	0 44	3.21	13.81	65 0%	0 23	5.07	1 58
	6 36	13.05	0 20	0 39	2.54	13.17	62 0%	0 19	3 55	1 39
	6 41	12 55	0 15	0 34	1 90	12.66	59 7%	0 15	2.25	1 18
	6.46	12 08	0.11	0.29	1 29	12 17	57.4%	0.11	1 20	0.93
	6.51	10 69	0 07	0.24	0 70	10.77	50.7%	0.07	0.47	0.68
	6.56	5 94	0 05	0.19	0.28	6.00	28.3%	0 05	0 16	0 55
	6 61	2.09	0 04	0 14	0 09	2.14	10 1%	0 04	0 04	0.50
	6 66	0.60	0 04	0.09	0 03	0 63	3 0%	0 04	0 01	0.51
	6.71	0.26	0.02	0.04	0.01	0 27	1.3%	0 02	0 00	0.29

$\overline{Tv}$ $\frac{1-0.93}{1.18-0.93} = \frac{N-1.2}{2.25-1.2}$ $N = 1.49$

STREAM NAME. Cottonwood Creek
XS LOCATION At "narrows" feature on topo map, about 6mi US from Roubideau Ck.
XS NUMBER 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	4.87 cfs
CALCULATED FLOW (Qc)=	5.07 cfs
(Qm-Qc)/Qm * 100 =	-4 0 %
MEASURED WATERLINE (WLm)=	6.25 ft
CALCULATED WATERLINE (WLc)=	6.31 ft
(WLm-WLc)/WLm * 100 =	-1 0 %
MAX MEASURED DEPTH (Dm)=	0.35 ft
MAX CALCULATED DEPTH (Dc)=	0 44 ft
(Dm-Dc)/Dm * 100	-25.2 %
MEAN VELOCITY=	1 58 ft/sec
MANNING'S N=	0 038
SLOPE=	0.0116 ft/ft
4 * Qm =	1 9 cfs
2 5 * Qm=	12.2 cfs

RECOMMENDED INSTREAM FLOW.

FLOW (CFS)	PERIOD
3.55	Summer
1.49	Winter

RATIONALE FOR RECOMMENDATION

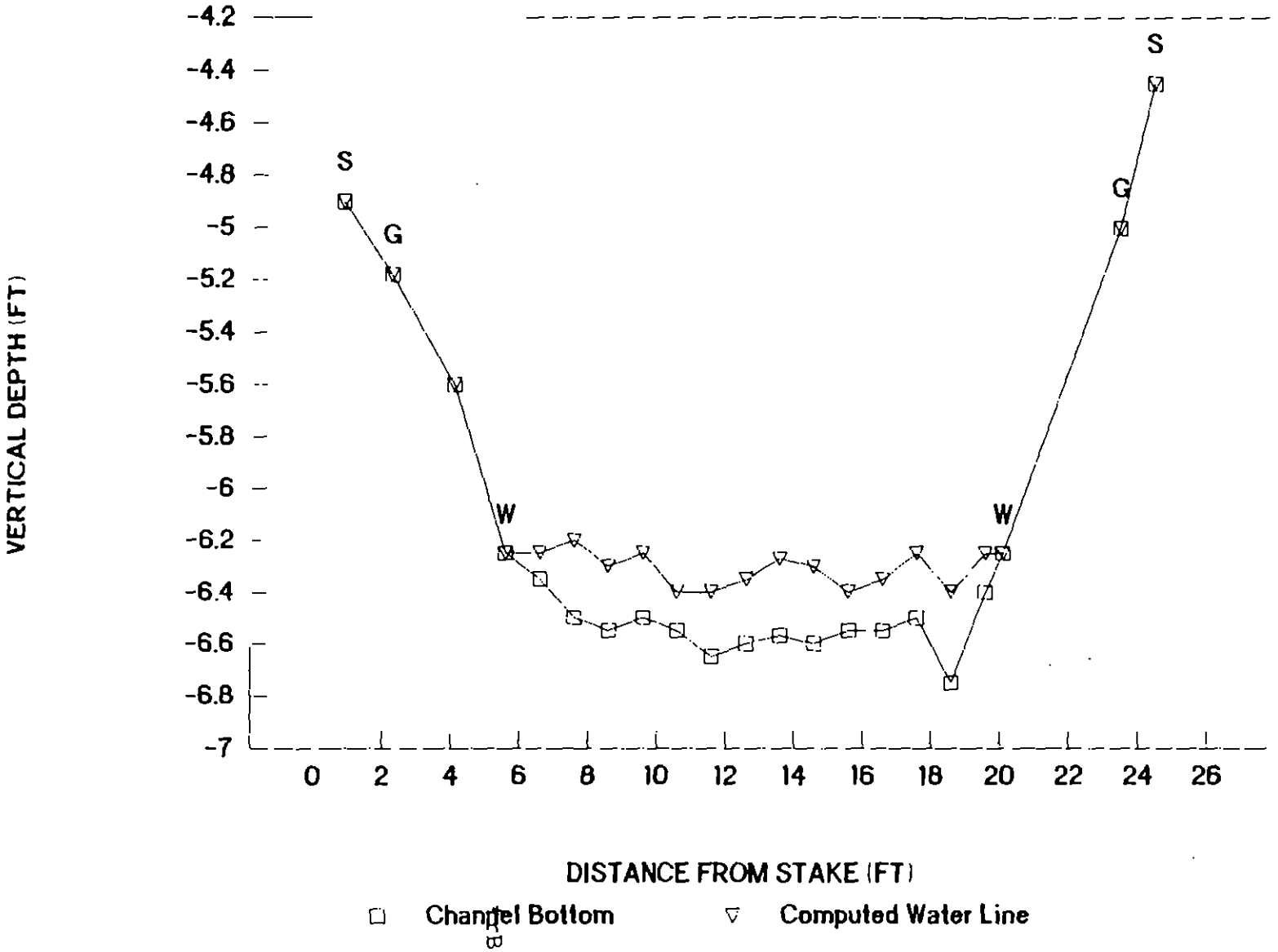
A summer flow of 3.55 cfs satisfies all 3 criteria
A winter flow of 1.49 cfs satisfies 2 of 3 criteria

RECOMMENDATION BY: Bill Carey .. AGENCY.. BLM .. DATE 10/7/98

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

Cottonwood Creek

CROSS SECTION DATA ANALYSIS



COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Cottonwood Creek - trib. to Gunnison R. - lower | CROSS-SECTION NO: 1

CROSS SECTION LOCATION: At "narrows" feature on jeep road ≈ 6 miles upstream from confluence with Roubideau Creek

DATE: 3.25-94 | OBSERVERS: M. Potter, R. Smith

LEGAL DESCRIPTION: ¼ SECTION: SW NW | SECTION: 27 | TOWNSHIP: 51 (N) S | RANGE: 12 E (W) | PM: N.M.

COUNTY: Delta | WATERSHED: Gunnison | WATER DIVISION: 4 | DOW WATER CODE: 39699

MAP(S): USGS: Roubideau, CO | UTM Z-12S: 0743007 4281915 | USFS:

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES) NO | METER TYPE: Marsh-McBirney

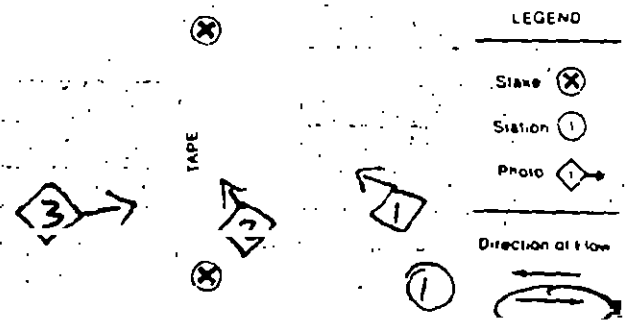
METER NUMBER: | DATE RATED: | CALIB/SPIN: ___ sec | TAPE WEIGHT: surveyed lbs/foot | TAPE TENSION: surveyed lbs

CHANNEL BED MATERIAL SIZE RANGE: gravel to 8" cobbles | 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	4.35 / 4.35
② WS Upstream	15.0'	4.26
③ WS Downstream	15.0'	4.75
SLOPE	0.49/30.0' =	0.01633

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
see previous survey																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME

annelids, snails - too early too cer. aquatic insects

COMMENTS

TDS = 760 Ph = 7.5 Temp = 10.3 C

DISCHARGE/CROSS SECTION NOTES

STREAM NAME Cottonwood Creek | CROSS-SECTION NO 1 | DATE 3-25-04 | SHEET 1 OF 1

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM (0.0 AT STAKE) | LEFT / RIGHT | Gage Reading 0.85 ft | TIME 9:35

Features	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		2.4								
G	2.4		3.58								
	2.6		3.94								
W	5.3		4.35					0			
	6.0		4.37	0.05				0			
	6.5		4.40	0.05				0			
	7.0		4.39	0.05				0			
	7.5		4.40	0.05				0			
	8.0		4.46	0.10				0.69			
	8.5		4.66	0.30				0.75			
	9.0		4.65	0.30				0.67			
	9.5		4.60	0.25				0.75			
	10.0		4.70	0.35				0.70			
	10.5		4.69	0.35				0.65			
11.25	11.0		4.60	0.25				1.47			
	11.5		4.52	0.20				0.97			
	12.0		4.52	0.20				1.67			
	12.5		4.56	0.20				0.71			
	13.0		4.58	0.20				0.76			
	13.5		4.52	0.15				0			
	14.0		4.35	0							
W	15.0		4.35	0							
	16.1		4.27								
	20.7		4.00								
G	24.7		3.45								
RS	26.6		1.90								

TOTALS

End of Measurement | Time 9:50 | Gage Reading: 0.35 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:	Cottonwood Creek (trib To Gunnison)
XS LOCATION	At "narrows" feature on topo map approx 6 miles us from confluence with Roubideau
XS NUMBER.	1
DATE	25-Mar-04
OBSERVERS.	M.Potter and R.Smith
1/4 SEC:	SWNW
SECTION:	27
TWP.	51N
RANGE	12W
PM:	N M
COUNTY:	Delta
WATERSHED:	Gunnison
DIVISION.	4
DOW CODE:	39699
USGS MAP:	Roubideau 7.5' quad
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	0.01633

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

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

STREAM NAME: Cottonwood Creek (trib. To Gunnison)
XS LOCATION At "narrows" feature on topo map approx 6 miles us from confluence with Roubideau
XS NUMBER 1

DATA POINTS= 30 VALUES COMPUTED FROM RAW FIELD DATA

	FEATURE	DIST	VERT DEPTH	WATER DEPTH	VEL	WETTED PERIM.	WATER DEPTH	AREA (Am)	Q (Qm)	% Q CELL
	LS	0 00	2 40			0 00		0 00	0.00	0.0%
1	G	2 40	3.58			0.00		0 00	0.00	0.0%
		2 60	3 94			0 00		0.00	0 00	0 0%
	W	5.30	4.35			0.00		0 00	0 00	0 0%
		6 00	4.37	0 05		0.70	0 05	0 03	0 00	0 0%
		6 50	4 40	0 05		0.50	0.05	0.03	0.00	0.0%
		7 00	4 39	0 05		0 50	0.05	0 03	0.00	0.0%
		7.50	4.40	0.05		0 50	0 05	0.03	0 00	0.0%
		8.00	4 46	0 10	0 69	0 50	0 10	0 05	0 03	2.9%
		8 50	4 66	0 30	0.73	0 54	0 30	0 15	0 11	9.3%
		9 00	4.65	0 30	0 67	0 50	0.30	0 15	0 10	8.5%
		9 50	4 60	0.25	0 75	0 50	0 25	0 13	0 09	8 0%
		10 00	4 70	0 35	0.70	0.51	0 35	0 18	0 12	10 4%
		10.50	4.69	0.35	0 65	0 50	0.35	0 18	0 11	9.7%
		11 00	4.60	0 25	1.47	0.51	0 25	0.09	0 14	11.7%
		11.25	4 60	0.25	0 84	0.25	0.25	0 06	0.05	4 5%
		11 50	4 54	0.20	0.97	0 26	0 20	0 05	0 05	4.1%
		11.75	4 55	0 20	1.50	0.25	0 20	0 05	0 08	6.4%
		12.00	4.56	0.20	1 67	0.25	0.20	0 05	0 08	7 1%
		12 25	4 56	0 20	0.76	0.25	0 20	0.05	0 04	3 2%
		12.50	4 56	0 20	0.71	0.25	0.20	0.05	0 04	3 0%
		12.75	4.58	0 20	1 49	0.25	0 20	0.05	0.07	6 3%
		13.00	4.58	0 20	0 76	0 25	0 20	0 08	0 06	4 8%
		13.50	4 52	0 15	0.00	0.50	0 15	0 08	0 00	0.0%
	W	14.00	4 35			0 53		0 00	0 00	0.0%
		15 00	4 35			0.00		0 00	0 00	0.0%
		16 10	4.27			0 00		0 00	0.00	0.0%
		20 70	4 00			0 00		0 00	0 00	0 0%
1	G	24.70	3.45			0.00		0 00	0 00	0.0%
	RS	26 60	1 90			0 00		0 00	0 00	0 0%
	TOTALS ----------					8 80	0 35 (Max.)	1.54	1 18	100.0%

Manning's n = 0 0774
Hydraulic Radius= 0 174492282

STREAM NAME Cottonwood Creek (tnb To Gunnison)
XS LOCATION. At "narrows" feature on topo map approx 6 miles us from confluence v
XS NUMBER· 1

WATER LINE COMPARISON TABLE

WATER LINE	MEAS AREA	COMP AREA	AREA ERROR
	1 54	1.55	1.0%
4.10	1.54	4.66	203.3%
4 12	1 54	4.36	183.7%
4.14	1.54	4.07	164.6%
4 16	1.54	3.78	146.2%
4.18	1 54	3.51	128 4%
4 20	1.54	3.24	111.2%
4.22	1.54	2.99	94 6%
4 24	1 54	2.74	78.6%
4.26	1.54	2.51	63 2%
4 28	1 54	2 28	48 5%
4.30	1.54	2.06	34 3%
4.31	1 54	1.96	27.3%
4 32	1.54	1.85	20.6%
4 33	1.54	1.75	13.9%
4 34	1.54	1.65	7.4%
4.35	1.54	1 55	1 0%
4.36	1.54	1.47	-4 5%
4.37	1.54	1.39	-9 8%
4 38	1 54	1 31	-14 9%
4 39	1 54	1.23	-19.9%
4 40	1.54	1 16	-24 4%
4.42	1.54	1.04	-32 5%
4.44	1 54	0.92	-40 4%
4.46	1.54	0.80	-47.9%
4.48	1.54	0.69	-55 2%
4 50	1 54	0 58	-62 4%
4 52	1.54	0.47	-69.4%
4.54	1.54	0.36	-76.3%
4.56	1.54	0 27	-82.4%
4 58	1.54	0 20	-87.1%
4 60	1 54	0.14	-90.9%

WATERLINE AT ZERO
AREA ERROR = 4.352

STREAM NAME: Cottonwood Creek (trib To Gunnison)
XS LOCATION: At "narrows" feature on topo map approx 6 miles us from confluence with Roubideau
XS NUMBER: 1 — 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"	3 58	21 35	0 68	1 12	14 58	21 74	100 0%	0 67	27 40	1 88
	3 60	21 18	0 67	1 10	14 12	21 56	99 1%	0 65	26 11	1 85
	3 65	20 79	0 63	1 05	13 07	21.13	97 2%	0 62	23 26	1 78
	3 70	20 40	0 59	1 00	12 04	20 71	95 2%	0 58	20 57	1 71
	3 75	20 01	0 55	0 95	11.03	20 28	93 3%	0 54	18 02	1 63
	3 80	19 62	0 51	0 90	10 04	19 86	91 3%	0 51	15 62	1 56
	3 85	19 23	0 47	0.85	9 06	19 43	89 4%	0 47	13 37	1 48
	3 90	18 83	0 43	0 80	8 11	19 01	87 4%	0 43	11 28	1 39
	3 95	18 37	0 39	0 75	7 18	18 52	85 2%	0 39	9 37	1 30
	4 00	17 66	0 36	0 70	6 28	17 80	81 9%	0.35	7.69	1 22
	4 05	16 48	0 33	0 65	5 43	16 62	76 4%	0 33	6 31	1 16
	4 10	15 30	0 30	0 60	4 63	15 43	71 0%	0 30	5 09	1 10
	4 15	14 12	0 28	0 55	3.90	14 24	65 5%	0 27	4 03	1.03
	4 20	12 94	0 25	0 50	3 22	13 06	60 1%	0 25	3 11	0 96
	4 25	11 76	0 22	0 45	2 60	11 87	54 6%	0 22	2 32	0 89
	4 30	10 68	0 19	0 40	2 04	10 79	49 6%	0 19	1 65	0 81
"WL"	4 35	8 63	0 18	0 35	1 54	8 73	40 2%	0 18	1 18	0 77
	4 40	6 33	0 18	0 30	1 15	6 43	29 6%	0 18	0 90	0 78
	4 45	5 77	0 15	0 25	0 85	5 85	26 9%	0 14	0 57	0 68
	4 50	5 45	0 10	0.20	0.57	5 51	25 4%	0 10	0 31	0 54
	4 55	4 66	0 07	0 15	0 31	4 71	21 7%	0.07	0 12	0 40
	4 60	2 61	0 05	0 10	0 13	2 64	12 1%	0 05	0 05	0 34
	4 65	1 38	0 02	0 05	0 03	1.39	6 4%	0 02	0 01	0 20

Criteria

Flow Range: 0.5 - 2.9 cfs

1. 0.2 ave. depth · 0.19 1.65 $\frac{0.01}{0.03} = \frac{x}{0.67} = 0.223$
0.2 x
0.22 2.32
$\bar{d}$ = 1.87 cfs

2. 50% Wetted Perimeter: 49.6% 1.65 $\frac{0.4}{5} = \frac{x}{0.67} = 0.0536$
50 x
54.6% 2.32
50% WP = 1.70 cfs

3. 1 ft/sec $\bar{v}$: 0.96 3.11 $\frac{0.04}{0.07} = \frac{x}{0.92} = 0.5257$
/ x
1.03 4.03
$\bar{v}$ = 3.64 cfs

STREAM NAME Cottonwood Creek (trib To Gunnison)
XS LOCATION At "narrows" feature on topo map approx 6 miles us from confluence with Roubideau
XS NUMBER 1

SUMMARY SHEET

MEASURED FLOW (Qm)=	1 18	cfs
CALCULATED FLOW (Qc)=	1 18	cfs
(Qm-Qc)/Qm * 100 =	-0 5	%
MEASURED WATERLINE (WLm)=	4 35	ft
CALCULATED WATERLINE (WLc)=	4 35	ft
(WLm-WLc)/WLm * 100 =	0 0	%
MAX MEASURED DEPTH (Dm)=	0 35	ft
MAX CALCULATED DEPTH (Dc)=	0 35	ft
(Dm-Dc)/Dm * 100	0 5	%
MEAN VELOCITY=	0 77	ft/sec
MANNING'S N=	0 077	
SLOPE=	0 01633	ft/ft
4 * Qm =	0 5	cfs
2 5 * Qm=	2 9	cfs

RECOMMENDED INSTREAM FLOW

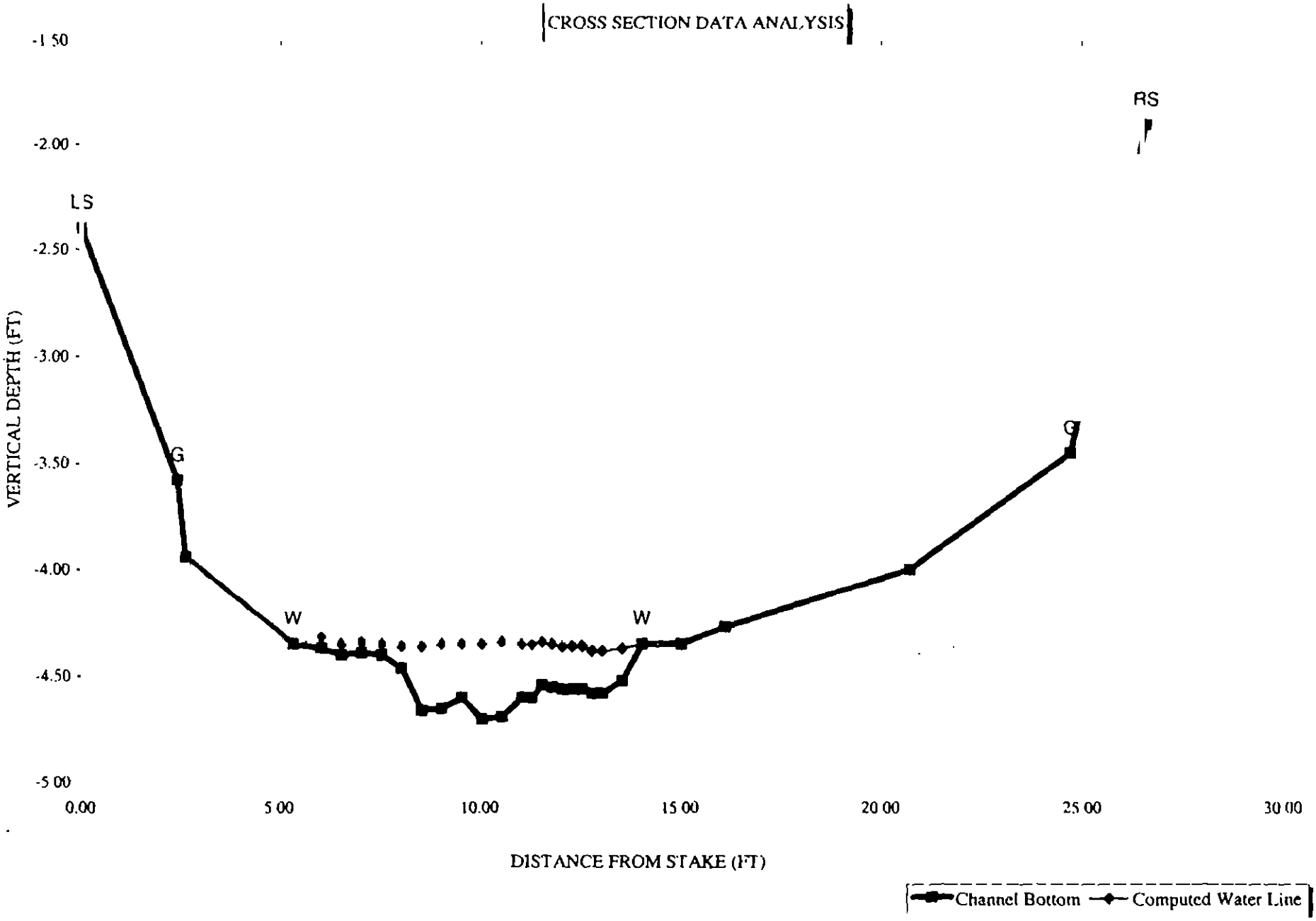
FLOW (CFS)	PERIOD
1 87	winter

RATIONALE FOR RECOMMENDATION

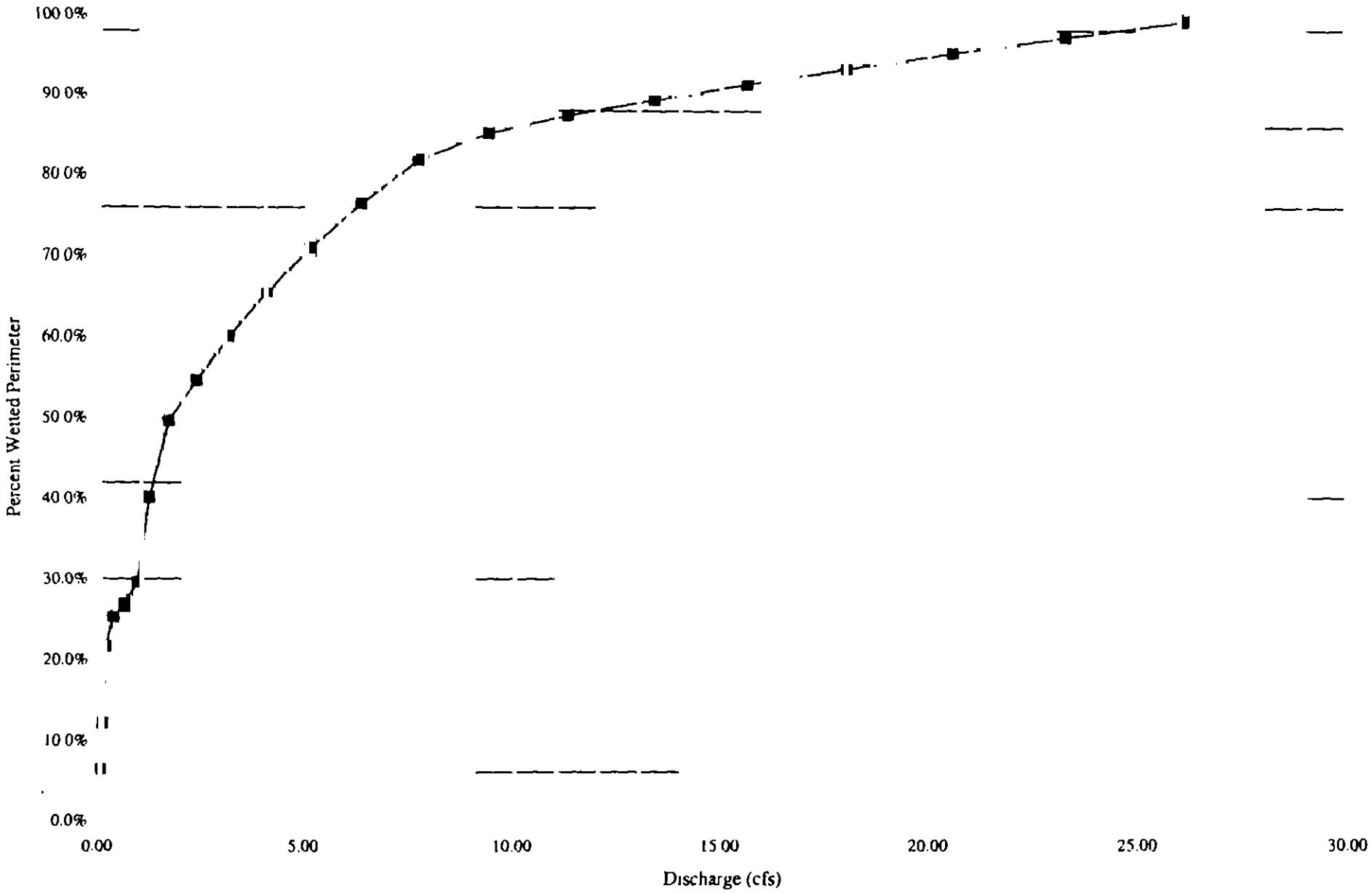
RECOMMENDATION BY . . . . AGENCY . . . . DATE . . .

CWCB REVIEW BY . . . . DATE . . .

Cottonwood Creek (trib. To Gunnison)



Percent Wetted Perimeter vs. Discharge



Upper

CDOW STREAM SURVEY (1991 REVISION)

LEVEL 2: FIELD SURVEY SUMMARY

County:

Quad:

STREAM: Cottonwood Cr (upper) SEC#: — WATER CODE: _____ CDOW REGION: W

SURVEYORS: David Smith, R.J. Smith, Dennis Murphy DATE OF SURVEY: 3 June 91

SURVEY LOCATION: T 49N R 13W S 5 SESE ELEVATION: _____ STATION #: 9

UTM ZONE: _____ UTM X: UTM Y:

LOCATION DESCRIPTION: Near BLM - USFS boundary

STREAM FLOW PROFILE (Y or N): Y IF YES-DATE AND TYPE Y-2 Cross

HABITAT EVALUATION (Y or N): N IF YES-DATE AND TYPE —

WATER CHEMISTRY ANALYSIS (Y or N): N IF YES-ATTACH SEPARATE ANALYSIS SHEET

FISH PRESENT (Y or N): Y POP. EST. METHOD: — STATION LENGTH: 200 ? (FEET)

AVG. WIDTH: 8 ? (FEET) TOTAL STATION AREA: .036 (ACRES)

FLOW (CFS) AT TIME OF SURVEY: ? METHOD: McBurney

LIMITING FACTORS TO FISHERY: Lack of Cover

COMMENTS: Rock very scarce. Rocks discolored (iron ox. Murphy). A few caddisfly larvae and small mayflies & stoneflies

Very rocky stream bed

LENGTH FREQUENCY RECORD (CM)

SPECIES	0–2	2–4	4–6	6–8	8–10	10–12	12–14	14–16	16–18	18–20	20–22	22–24	24–26	26–28	28–30	30–32	32–34	34–36	36–38	38–40	40–42	42–44	44–46	46–48	48
NAT										•	•	•													NO

SUMMARY INFORMATION

SPECIES	NO. FISH CAUGHT	AVG. LENGTH (CM)	LENGTH RANGE (CM)	AVG. WEIGHT (Grams)	WEIGHT RANGE (Grams)	% TOTAL CATCH	BIOMASS lb/Acre	DENSITY No./Acre	DENSITY Conf. Int.
NAT	3	19.9	19.3-20.5	84	78-100	100 %	15.4	83	
							83		

COLORADO DIVISION OF WILDLIFE

Length-Weight Data File

Stream Name Cottonwood Creek #2 CDOW Water Code _____ Date 3 June 98

Gear Coll.H-Electroshocke Effort — Station No. 1

Species Code	Total Length	Weight	Species Code	Total Length	Weight	Species Code	Total Length	Weight
NAT	20.5	100						
	19.2	74						
	20.0	79						
	Tot 59.7	Tot 253						
	Ave 19.9	Ave 84						

CH. NP. PR FILE

Comments:

COLORADO DIVISION OF WILDLIFE

Length-Weight Data File

Stream Name Lower Cottonwood Creek ? CDOW Water Code _____ Date 3 June 98

Gear Coffelt electroshocker Effort 19 minutes Station No. 1

Species Code	Total Length (cm)	Weight (g)	Species Code	Total Length (cm)	Weight (g)	Species Code	Total Length (cm)	Weight (g)
BHS	33.0	375	FMS	16.2	50.	SPO	10.3	10
	30.0	240		12.7	28	"	8.0	8
	29.5	272		15.0	37	"	7.6	10
	27.0	172		13.9	35	"	5.0	6.0
	30.0	262		14.5	24.0	"	1 fish	14
	32.3	352		12.2	15			
	32.0	362		11.2	17		Tot. Ave.	Tot 48 Ave 3.7
	26.2	160		10.4	16			
	22.5	90		6.2	6			
	27.0	166		5.2	4			
	26.5	160	"	5.6	4			
	27.8	194						
	29.6	224		Tot. 123.1 Ave. 11.2	Tot 236 Ave 21.5			
	32.0	338						
	24.5	128						
	19.7	64						
	31.0	218						
	25.0	150						
	26.3	144						
	22.3	96	RTC?	13.1	20			
	23.0	118						
	9.4	8						
Tot.	554.5	4273						
Ave.	25.2	194						

END

Comments: One huge fish was tuned but escaped.

CDOW STREAM SURVEY (1991 REVISION)

LEVEL 2: FIELD SURVEY SUMMARY

Delta County
Roubideau - Quad

STREAM: Colvin (upper) SEC#: — WATER CODE: _____ CDOW REGION: W

SURVEYORS: R Smith, D Smith, D Munoh DATE OF SURVEY: 6-3-98

SURVEY LOCATION: T 51 N R 12 W S 22 SW/4 ELEVATION: _____ STATION #: 1

UTM ZONE: UTM X: UTM Y:

LOCATION DESCRIPTION: At "narrows" ~6 mi. upstream from confluence with Roubideau Cr.

STREAM FLOW PROFILE (Y or N): Y IF YES-DATE AND TYPE 3 June 98, Y-2 Cross

HABITAT EVALUATION (Y or N): N IF YES-DATE AND TYPE —

WATER CHEMISTRY ANALYSIS (Y or N): N IF YES-ATTACH SEPARATE ANALYSIS SHEET

FISH PRESENT (Y or N): Y POP. EST. METHOD: — STATION LENGTH: 855 (FEET)

AVG. WIDTH: 8 (FEET) 6,840 (Est) TOTAL STATION AREA: .157 (ACRES)

FLOW (CFS) AT TIME OF SURVEY: METHOD: Mc Burney

LIMITING FACTORS TO FISHERY: hl temps, low flows

COMMENTS: A large amount of organic matter was found in the water column. Leeches, blackfly & caddisfly larvae. Many fish in active beaver ponds.

LENGTH FREQUENCY RECORD (CM)

SUMMARY INFORMATION

SPECIES	NO. FISH CAUGHT	AVG. LENGTH (CM)	LENGTH RANGE (CM)	AVG. WEIGHT (Grams)	WEIGHT RANGE (Grams)	% TOTAL CATCH	BIOMASS lb/Acre	DENSITY No./Acre	DENSITY Conf. Int.
RHS	82	25.2	9.4-33	195.1	8-375	47	60.3	299	
FMS	11	11.2	5.2-16.2	21.5	4-50	23	3.3	146	
RTC	1	13.1	—	20	—	2	.3	13	
SPD	13	—	—	3.7	—	28	.7	178	

APPENDIX – C
Water Availability Analysis

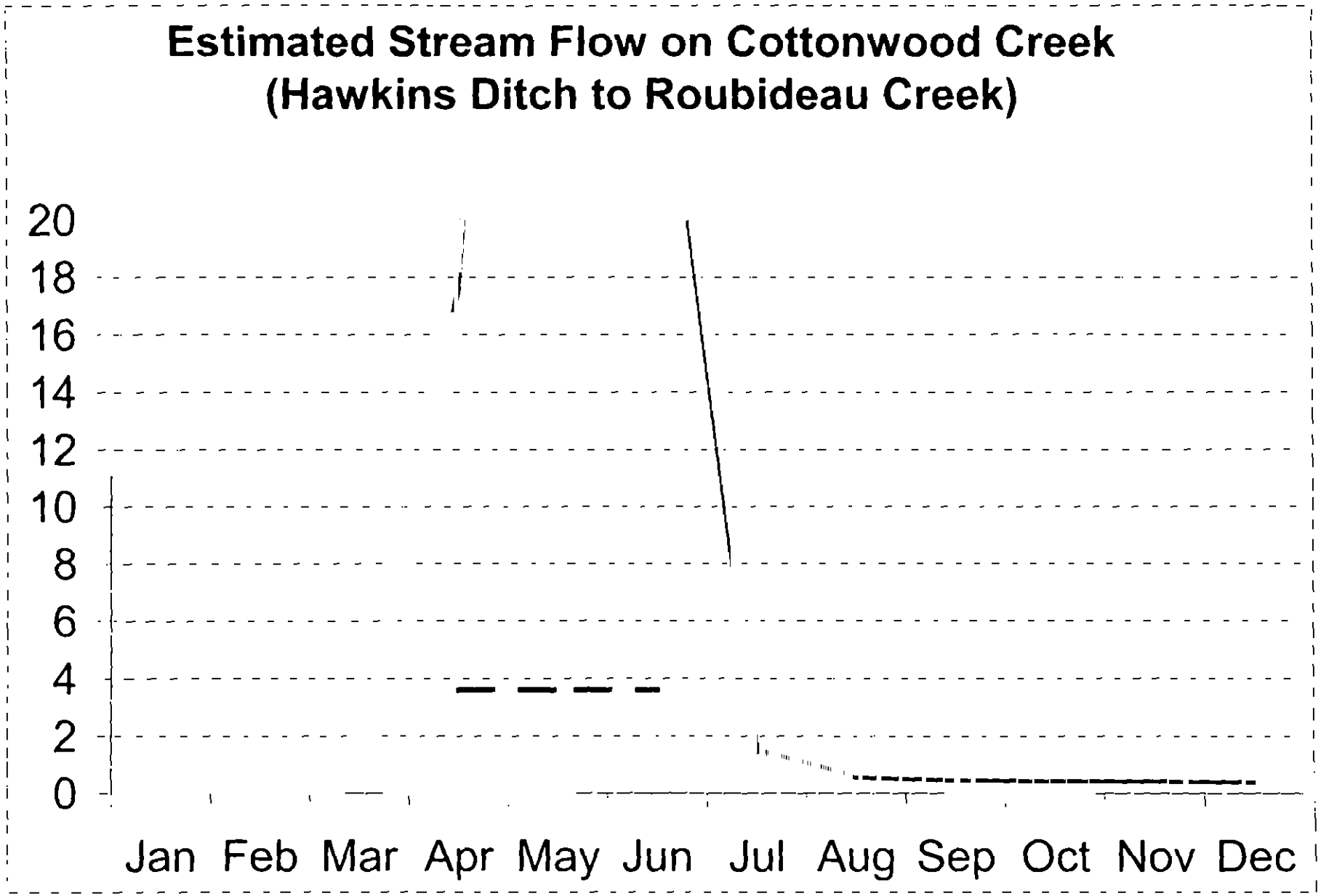
Water Yield Estimates

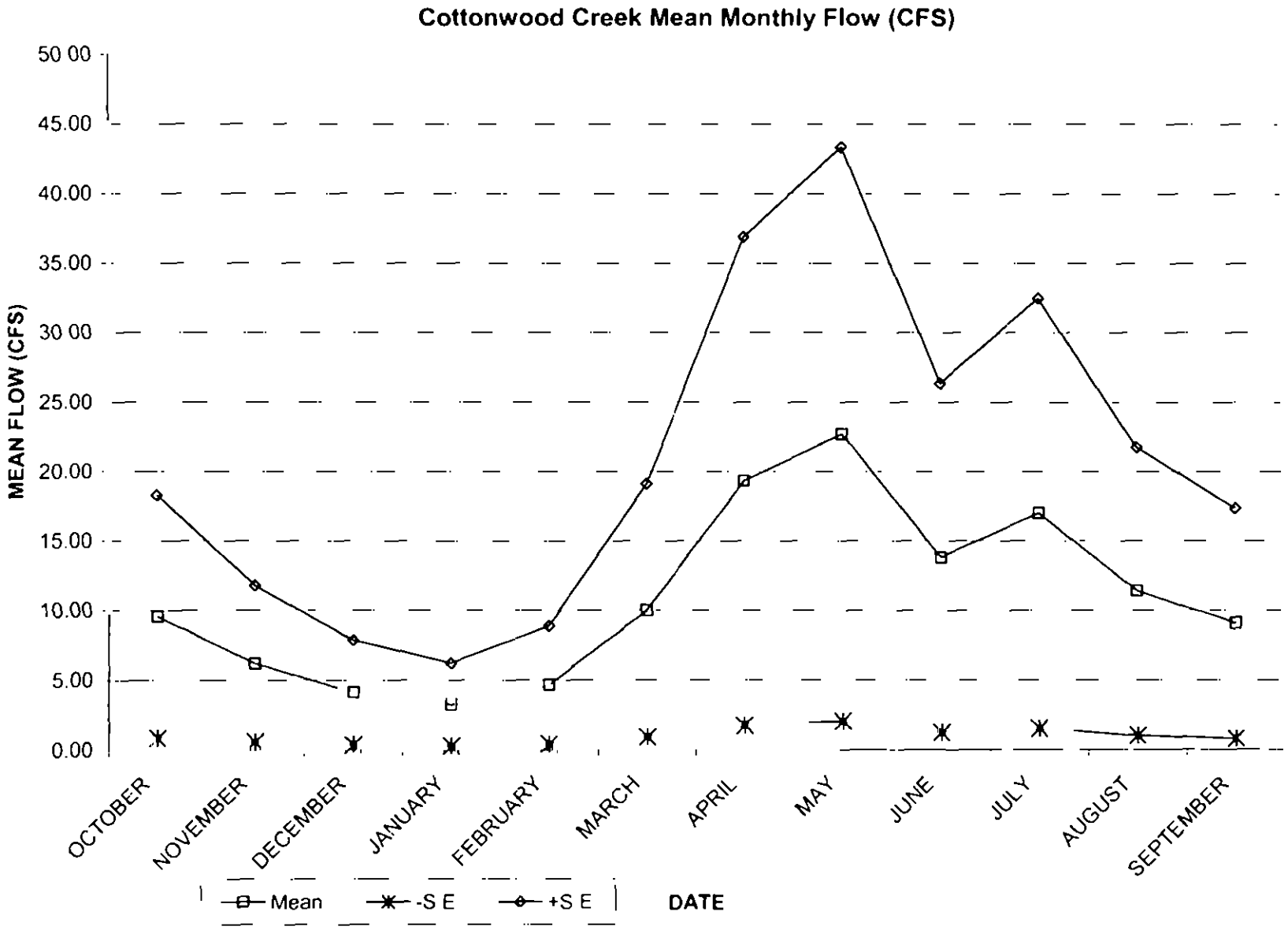
Watershed **Cottonwood Creek**
Location

Drainage Area Square Miles	46 71
Mean Basin Elev Ft	6988 76
Mean Basin Elev -5000 ft/1000 ft	1 98876

Mean Annual Flow cfs	9 744
Mean Annual Yield AF	7054

	%of flow	AF/Month	AF/Day	Mean Monthly flow cfs
Jan	0 0032	22 579	0 728	0 368
Feb	0 0065	45 863	1 581	0 799
Mar	0.0100	70 559	2.276	1 150
Apr	0 1470	1037 211	34 574	17 461
May	0 5541	3908 944	126 095	63 684
Jun	0 2461	1735 740	57 858	29 221
Jul	0 0130	91 726	2 959	1 494
Aug	0.0050	35 279	1 138	0 575
Sep	0 0040	28 223	0 941	0 475
Oct	0 0039	27 518	0 888	0 448
Nov	0 0037	26 107	0 870	0 440
Dec	0 0035	24 695	0 797	0 402


Estimated Stream Flow on Cottonwood Creek
(Hawkins Ditch to Roubideau Creek)
20
18
16
14
12
10
8
6
4
2
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

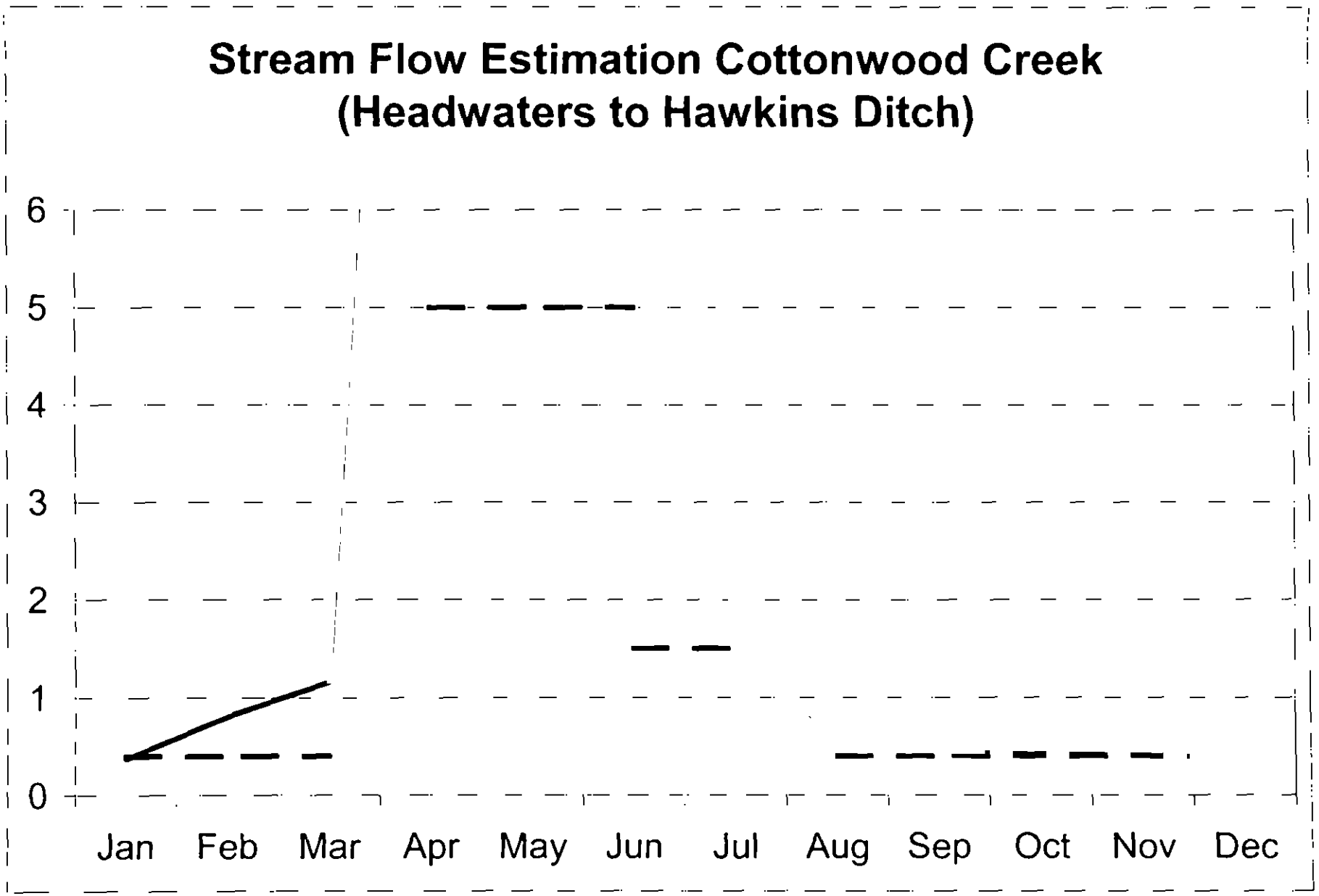

Cottonwood Creek Mean Monthly Flow (CFS)
MEAN FLOW (CFS)
50 00
45.00
40.00
35.00
30 00
25.00
20.00
15.00
10.00
5.00
0.00
OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
Mean
-S E
+S E
DATE

Water Yield Estimates

Watershed: **Cottonwood Creek**
Location.

Drainage Area Square Miles	11 25
Mean Basin Elev Ft	9129 934
Mean Basin Elev -5000 ft/1000 ft	4.129934
Mean Annual Flow cfs	9.816
Mean Annual Yield AF	7106

	%of flow	AF/Month	AF/Day	Mean Monthly flow cfs
Jan	0 0032	22 745	0 734	0 371
Feb	0 0065	46 202	1 593	0 805
Mar	0 0100	71 080	2 293	1 158
Apr	0 1470	1044 870	34 829	17 590
May	0 5541	3937 809	127 026	64 155
Jun	0 2461	1748 558	58 285	29 437
Jul	0.0130	92 403	2 981	1 505
Aug	0 0050	35 540	1 146	0 579
Sep	0 0040	28 432	0 948	0 479
Oct	0 0039	27 721	0.894	0 452
Nov	0 0037	26 299	0 877	0 443
Dec	0 0035	24 878	0 803	0 405


Stream Flow Estimation Cottonwood Creek
(Headwaters to Hawkins Ditch)
6
5
4
3
2
1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Colorado Water Conservation Board
Estimation of Natural Streamflow Characteristics
Based upon USGS WRI 85-4086

By: Francis Rompers and Mark Miller Date: 1-30-2005

STREAM	STREAM NAME	BASIN AREA (MI²)	46 71
COUNTY	COUNTY NAME	MEAN ELEV (FEET)	7214
REGION	2	MEAN PPT (INCHES)	18 0
1=MT,2=SW,3=NW,4=RG		MEAN SLOPE (FT/FT)	0 1833
CROSS-SECTION			
LOCATION			

AVE ANNUAL FLOW (CFS)	

PERCENT DURATION	FLOW (CFS)
90	1 27
70	3 15
50	6 19
25	18 42
10	55 79

2-YR 7 DAY LOW FLOW (CFS)	1 84
10-YR 7 DAY LOW FLOW (CFS)	0 00
50-YR 7 DAY LOW FLOW (CFS)	0 00

MEAN MONTHLY FLOW	AVERAGE FLOW (CFS)	-S E	+S E
OCTOBER	9 57	0 86	18 28
NOVEMBER	6 17	0 56	11 79
DECEMBER	4 11	0 37	7 85
JANUARY	3 25	0 29	6 20
FEBRUARY	4 65	0 42	8 88
MARCH	10 00	0 90	19 10
APRIL	19 30	1 74	36 87
MAY	22 69	2 04	43 33
JUNE	13 80	1 24	26 36
JULY	17 00	1 53	32 46
AUGUST	11 38	1 02	21 74
SEPTEMBER	9 08	0 82	17 35

Water Yield Estimates

Watershed **Cottonwood Creek (Francis)**
Location

Drainage Area Square Miles	46 71
Mean Basin Elev Ft	6988 76
Mean Basin Elev -5000 ft/1000 ft	1 98876

Mean Annual Flow cfs	9 744
Mean Annual Yield AF	7054

	%of flow	AF/Month	AF/Day	Mean Monthly flow cfs	**Hydrodata (cfs)**	USGS
Jan	0 0032	48.475	1 564	0 790	**7.791268**	3 25
Feb	0 0065	98 464	3.395	1 715	**7.427942**	4 65
Mar	0 0100	151 483	4 887	2 468	**8.862821**	10 00
Apr	0.1470	2226 800	74 227	37 488	**38 37979**	19 30
May	0 5541	8392 158	270 715	136 725	**94.04014**	22 69
Jun	0 2461	3726 482	124 216	62 735	**34.86065**	13 80
Jul	0 0130	196 928	6 353	3 208	**12.43288**	17 00
Aug	0 0050	75 741	2 443	1 234	**15.05909**	11 38
Sep	0 0040	60 593	2 020	1 020	**20.28642**	9 08
Oct	0 0039	59 078	1 906	0 963	**19.68221**	9 57
Nov	0 0037	56 049	1 868	0 944	**14.43416**	6 17
Dec	0 0035	53 019	1 710	0 864	**9.510796**	4 11

Water Yield Estimates

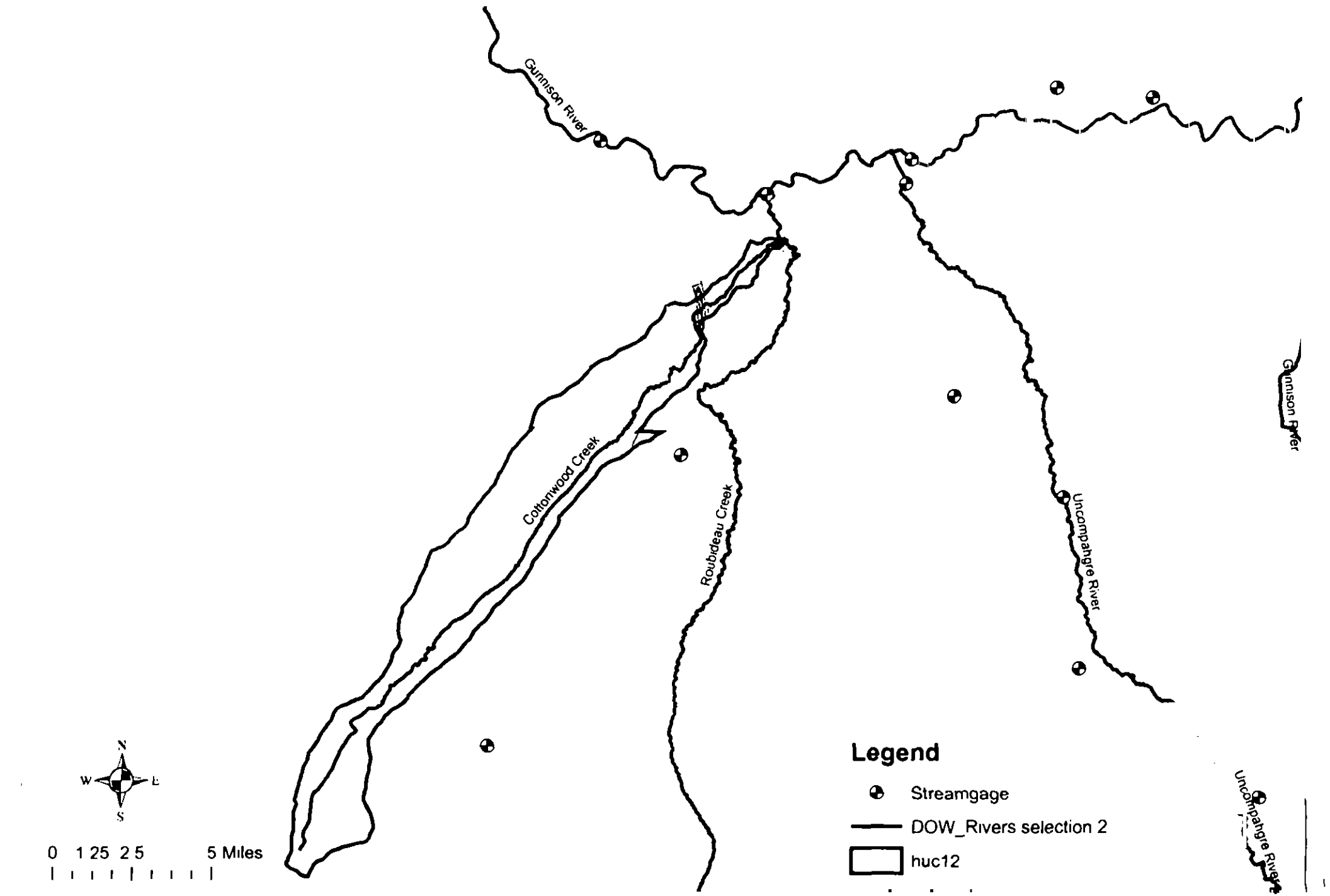
Watershed **Cottonwood Creek**
Location

Drainage Area Square Miles	51 2
Mean Basin Elev Ft	7944
Mean Basin Elev -5000 ft/1000 ft	2.944

Mean Annual Flow cfs	20 920
Mean Annual Yield AF	15145

	%of flow	AF/Month	AF/Day	Mean Monthly flow cfs	**Hydrodata (cfs)**	USGS
Jan	0.0032	48.475	1 564	0 790	**7.791268**	3 25
Feb	0 0065	98 464	3.395	1 715	**7.427942**	4 65
Mar	0 0100	151 483	4.887	2 468	**8.862821**	10 00
Apr	0.1470	2226 800	74 227	37 488	**38.37979**	19 30
May	0 5541	8392 158	270 715	136 725	**94.04014**	22 69
Jun	0 2461	3726 482	124 216	62 735	**34 86065**	13 80
Jul	0 0130	196 928	6.353	3 208	**12.43288**	17 00
Aug	0 0050	75 741	2 443	1 234	**15.05909**	11 38
Sep	0 0040	60 593	2 020	1.020	**20.28642**	9 08
Oct	0 0039	59.078	1 906	0 963	**19.68221**	9 57
Nov	0 0037	56 049	1 868	0 944	**14.43416**	6 17
Dec	0 0035	53 019	1 710	0 864	**9.510796**	4 11

Cottonwood Creek Watershed



Water Yield Estimates

Watershed **Cottonwood Creek (to ditch)**
Location

Drainage Area Square Miles	16 78
Mean Basin Elev Ft	8364
Mean Basin Elev -5000 ft/1000 ft	3 364

Mean Annual Flow cfs	9 798
Mean Annual Yield AF	7093

	%of flow	AF/Month	AF/Day	Mean Monthly flow cfs	**hydrodata (cfs)**	USGS
Jan	0 0032	48 475	1.564	0 790	2 7989	0.91
Feb	0 0065	98 464	3 395	1 715	2 6684	1 46
Mar	0 0100	151 483	4 887	2 468	3 1839	4 73
Apr	0 1470	2226 800	74 227	37 488	13 7875	9 73
May	0 5541	8392 158	270 715	136 725	33 7828	21 94
Jun	0 2461	3726 482	124 216	62 735	12 5233	15 57
Jul	0 0130	196 928	6 353	3 208	4 4664	4 67
Aug	0 0050	75 741	2 443	1 234	5 4098	3 64
Sep	0 0040	60 593	2 020	1 020	7 2877	2 86
Oct	0.0039	59 078	1.906	0 963	7 0706	3 18
Nov	0 0037	56 049	1 868	0 944	5 1853	2 02
Dec	0 0035	53 019	1 710	0 864	3.4166	1 23

Uncompahgre Plateau and Glade Park Annual Hydrograph Estimation

Although there is a substantial amount of streamflow gage data available for the Uncompahgre Plateau and Glade Park, most of this data is severely impacted by diversions and irrigation use. This situation makes it difficult to estimate the natural flow regime for the watersheds on the Plateau. Without specific gage data to evaluate the next best approach is a regional equation that estimates annual flow characteristics. The USGS has developed regional equations (Estimation of Natural Streamflow Characteristics in Western Colorado, Water Resources Investigations Report 85-4086, 1985) that apply to the Uncompahgre Plateau and Glade Park. The equation that applies is as follows:

$$Q_{ann} = 9.7 \times 10^{-2} (A^{0.888})(F_b^{1.74})(1.98)(365)$$

Q_{ann} = mean annual volume in acre - feet

A= drainage area in square miles

F_b = (mean basin elevation –5000)/1000

In order to verify the validity of this equation, the results were checked against gages that provided estimates of the natural annual discharge. Three gages were located that provide a diversion free estimate of a natural hydrograph.

Spring Creek near Beaver Hill: Period of record; 1978 -1980

Potter Creek near Olathe: Period of record; 1980

Hay Press Creek above Fruita Reservoir #3: Period of record, 1984 – 1987

Using the period of record for each of the gages a mean annual volume was calculated and compared to the results obtained using the regional equation.

Spring Creek near Beaver Hill:

Mean annual gage volume: 11,100 ac-ft

Annual volume regional equation. 11,300 ac-ft

Potter Creek near Olathe.

Mean annual gage volume: 5,000 ac-ft

Annual volume regional equation: 6,000 ac-ft

Hay Press Creek above Fruita Reservoir #3:

Mean annual gage volume: 575 ac-ft

Annual volume regional equation 625 ac-ft

The largest comparative difference in these gages is Potter Creek at about 17%. This is well within the standard error of the regional equation. However, the gage record for each of these creeks is limited. Therefore, two other creeks with a longer representative period of record were chosen to compare with the regional equations.

Escalante Creek near Delta Period of record; 1977 – 1988

Tabeguache Creek near Nucla: Period of record; 1947 –1952

Both of these gages are affected by diversions and irrigation. Using data obtained from Colorado River Decision Support Systems (Colorado Water Conservation Board, Department of Water Resources) that reflects diversion volumes, along with local estimates of irrigated acreage and return flows, the annual gage volumes were adjusted for these variations to estimate a natural annual volume.

Escalante Creek near Delta:

Mean annual adjusted gage volume: 84,000 ac-ft

Annual volume regional equation: 75,000 ac-ft

Tabeguache Creek near Nucla:

Mean annual adjusted gage volume: 15,000 ac-ft

Annual volume regional equation: 13,900 ac-ft

The gage data-regional equation comparison between these two gages coupled with the results from Potter Creek, Hay Creek, and Spring Creek indicates that the regional

equations apparently provide a reasonably accurate estimate of the total annual flow volume.

Once total annual volumes can be estimated, the question then becomes how to allocate this volume over a 12-month period. A mean annual monthly distribution was calculated using the annual hydrographs from Potter Creek, Spring Creek, and Hay Press Creek. These three creeks were used since they are the best unaltered representations of a natural plateau flow regime. The monthly distribution of volume based on a percentage of annual total volume is as follows:

January 0.32
February. 0.6
March. 1.0
April: 14.7
May: 55.4
June. 24.6
July. 1.3
August: 0.55
September. 0.45
October: 0.39
November: 0.35
December. 0.34

The regional equation with the proper input values was used to generate estimates of annual volumes for the following Uncompahgre Plateau and Glade Park watersheds. These annual volumes were then distributed according to the monthly distributions above. The distribution of water volumes across the months of the year was translated into mean monthly flows in the following spreadsheets.

APPENDIX – D
Diversion Records

Structure Name: EVERLASTING DITCH **Water District:** 40 **ID Number:** 1435

Source: ROUBIDEAU CREEK (circled) Acres Irrigated: 0

Location: Q160 Q40 Q10 Section Twnshp Range PM — NE SW SW 18 49 N 13 W N — CIU A

Distance from section lines: From N/S line — From E/W line

UTM Coordinates (NAD 83): Northing (UTM y) 4268116 7 Easting (UTM x) 206849 1 GPS

Latitude/Longitude (decimal degrees): 38 5132 -108 3621

Measuring Device/Recorder

Contact: HANK DAVIS(MANAGER) Phone:

Address: DELTA, COLO Cell Phone

E-mail

Water Rights Summary: Total Decreed Rate(s) Abs 22.2500 Cond 0 0000 AP/EX 0 0000

Total Decreed Volume(s) Abs 0 0000 Cond 0 0000 AP/EX 0.0000

Water Rights -- Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin. Number	O #	Priority Number	Decreed Amount	Adj Type	Uses	Comments
1	CA5873	8/11/1969	7/1/1964	41820 00000	0	L71	22 25 C	S	19	COTTONWOOD CR TRIB ROUBIDEAUX CR P3109

Diversion Summary in Acre-Feet - Total Water through Structure

IYR	FDU	LDU	DWC	Max Q	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total
1979	06/17	07/31	45	2	0	0	0	0	0	0	0	55 5	103	0	0	0	159
1980	07/14	09/22	57	2 5	0	0	0	0	0	0	0	0	44 6	128	109	0	283
1981	04/08	10/07	183	2 75	0	0	0	0	0	113	133	152	138	134	111	27 8	811
1983	05/20	08/18	91	2 5	0	0	0	0	0	0	59 5	148	153	89 3	0	0	451
1984	06/11	08/13	64	2	0	0	0	0	0	0	0	79 3	122	45 1	0	0	247
1985	07/02	08/21	51	1 5	0	0	0	0	0	0	0	0	89 3	62 5	0	0	152
1988	05/20	06/27	39	6	0	0	0	0	0	0	124	267	0	0	0	0	393
1989	04/19	08/07	111	5 5	0	0	0	0	0	65 5	283	201	12 3	2 78	0	0	565
1990	05/07	06/14	39	3 5	0	0	0	0	0	0	154	97 2	0	0	0	0	252
1991	05/08	07/09	63	4	0	0	0	0	0	0	190	172	17 9	0	0	0	381
1992	05/22	09/02	104	5	0	0	0	0	0	0	99 2	207	61 9	13 5	0 20	0	382
1993	05/20	09/13	117	6	0	0	0	0	0	0	59 5	336	127	70 4	25 8	0	620
1994	05/04	08/30	119	3	0	0	0	0	0	0	164	120	20 0	11 9	0	0	318
1995	05/10	10/12	156	3	0	0	0	0	0	0	65 5	145	142	70.0	11 3	4 76	440
1996	04/30	08/20	113	5	0	0	0	0	0	9 92	292	95 2	13 3	3 97	0	0	415
1997	05/08	10/31	177	3	0	0	0	0	0	0	142	168	122	77 9	47 6	34 7	595
1998	05/01	10/31	184	3	0	0	0	0	0	0	184	148	44 1	30 7	29 8	30 7	469
1999	04/15	10/31	200	5	0	0	0	0	0	54 5	267	121	23 1	15 4	17 4	27 3	527
2000	04/29	10/31	146	4	0	0	0	0	0	15 9	162	81 3	20 3	7 44	1 19	6 15	295
2001	04/21	09/07	140	5 5	0	0	0	0	0	51 6	211	71 4	61 5	46 6	3 47	0	446
2002	04/20	10/18	84	3	0	0	0	0	0	45 6	89 3	37 2	0	0	0	3 37	175
2003	05/01	10/31	133	8	0	0	0	0	0	0	472	210	96 7	2 58	0	14 9	796
2004	04/01	10/31	204	3	0	0	0	0	0	29 8	123	101	15 4	8 63	5 36	11 8	297
	Minimum			1 5	0	0	0	0	0	0	0	0	0	0	0	0	151
	Maximum			8	0	0	0	0	0	113	472	336	153	134	111	34 7	811
	Average			3 8587	0	0	0	0	0	16 8	142	131	62 3	1 35 8	15 7	7 02	411
													2.	2	1	0.5	0.25

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1972	No information available	0	

Structure Name: EVERLASTING DITCH *Water District:* 40 *ID Number:* 1435

1983	440
1984	440
1985	440
1987	400
1988	400
1989	400
1990	400
1991	400
1992	400
1993	400
1994	400
1995	400
1996	400
1997	400
1998	400
1999	400
2000	400
2001	400
2002	400
2003	400
2004	400

Structure Name: HAWKINS DITCH **Water District: 40** **ID Number: 1437**

Source	ROUBIDEAU CREEK									*Acres Irrigated*	0
Location	Q160	Q40	Q10	Section	Twnshp		Range		PM	*CIU*	A
	NE	SW	SW	18	49	N	13	W	N		

Distance from section lines *From N/S line* *From E/W line*

UTM Coordinates (NAD 83) *Northing (UTM y)* 4268122.7 *Easting (UTM x)* 206880 6 *GPS*

Latitude/Longitude (decimal degrees): 38 5133 -108 3617

Measuring Device/Recorder

Contact BECKY STERLING(OWNER) *Phone*

Address CARBONDALE, CO *Cell Phone*

E-mail

Water Rights Summary	*Total Decreed Rate(s)*	*Abs*	31 0000	*Cond*	0 0000	*AP/EX*	0 0000	
	Total Decreed Volume(s)	*Abs*	0 0000	*Cond*	0 0000	*AP/EX*	0 0000	

Water Rights – Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin Number	O #	Priority Number	Decreed Amount	Adj Type	Uses	Comments
1	CA3503	3/20/1954	9/1/1947	35672 00000	0	J289	1 C	S	8	P2144
2	CA3503	3/20/1954	9/1/1947	35672 00000	0	J288	7 84 C	S,C	1	P2144
3	CA3503	3/20/1954	9/1/1947	35672 00000	0	J288	2 16 C	S	1	P2144
6	CA3503	3/20/1954	9/1/1947	35672 00000	0	J288	7 84 C	S,CA	1	CA 7/29/1964 P3489
5	CA3503	3/20/1954	4/1/1948	35885 00000	0	J300	5 C	S	189	FOR STORAGE IN HARRY WHITE RES 1+2 TWIN LAKI P2144
7	CA3503	3/20/1954	4/1/1948	35885 00000	0	J300	15 C	S,CA	189	CA 7/29/1964 P3488
4	CA3503	3/20/1954	4/1/1948	35885 00000	0	J300	15 C	S,C	189	FOR STORAGE IN HARRY WHITE RES 1+2 TWIN LAKI P2144

Diversion Summary in Acre-Feet - Total Water through Structure

IYR	FDU	LDU	DWC	Max Q	Nov	Dec	Jan.	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total
1983	05/20	08/18	91	6	0	0	0	0	0	0	142	357	368	214	0	0	1083
1984	06/11	07/30	50	5	0	0	0	0	0	0	0	198	297	0	0	0	496
1985	06/05	10/31	149	1 5	0	0	0	0	0	0	0	77 4	92 2	92 2	89 3	92 2	443
1986	06/16	08/20	66	1 25	0	0	0	0	0	0	0	37 2	53 1	29 8	0	0	120
1987	05/08	07/16	70	2 5	0	0	0	0	0	0	108	87 5	25 4	0	0	0	221
1988	05/20	07/02	44	2	0	0	0	0	0	0	44 6	119	7 93	0	0	0	172
1989	04/19	06/18	61	3	0	0	0	0	0	71 4	142	71 4	0	0	0	0	286
1990	05/07	06/14	39	5	0	0	0	0	0	0	189	2.78	0	0	0	0	192
1991	05/08	06/19	43	3 5	0	0	0	0	0	0	87 3	131	0	0	0	0	219
1992	05/22	06/17	27	2	0	0	0	0	0	0	39 7	67 4	0	0	0	0	107
1993	06/04	08/09	67	6	0	0	0	0	0	0	0	321	101	17 9	0	0	440
1994	05/04	07/03	61	3	0	0	0	0	0	0	164	120	8 93	0	0	0	295
1995	05/10	08/28	111	6	0	0	0	0	0	0	261	225	100	13 9	0	0	601
1996	04/30	05/28	29	3	0	0	0	0	0	5 95	166	0	0	0	0	0	173
1997	05/08	08/18	103	3	0	0	0	0	0	0	142	113	30 7	17 9	0	0	304
1998	05/01	07/22	83	3	0	0	0	0	0	0	184	144	4 36	0	0	0	333
1999	04/15	09/08	117	3	0	0	0	0	0	20 8	144	69 2	10 3	0 60	1 29	0	247
2000	04/29	07/10	73	4	0	0	0	0	0	15 9	132	55 5	9 92	0	0	0	214
2001	04/21	08/21	123	3	0	0	0	0	0	45 6	184	47 6	26 3	20 8	0	0	325
2002	04/30	06/25	57	0 25	0	0	0	0	0	0 50	8 07	0 99	0	0	0	0	9 56
2003	05/01	07/16	77	5	0	0	0	0	0	0	277	92 2	39 7	0	0	0	410
2004	04/01	08/17	139	1	0	0	0	0	0	29 8	39 7	24 2	6 15	3 37	0	0	103

Structure Name: HAWKINS DITCH **Water District:** 40 **ID Number:** 1437

	Minimum	0 25	0	0	0	0	0	0	0	0	0	0	0	0	9 56
	Maximum	6	0	0	0	0	0	71 4	277	357	368	214	89 3	92 2	1082
	Average	3 2727	0	0	0	0	0	8 63	111	107	53 8	18 7	4 12	4 19	308

2 2 1

M J J

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1971	No information available	0	
1972	No information available	0	
1985		100	
1987		100	
1988		100	
1989		100	
1990		100	
1991		100	
1992		100	
1993		100	
1994		100	
1995		100	
1996		100	
1997		100	
1998		100	
1999		100	
2000		100	
2001		100	
2002		100	
2003		100	
2004		100	

Structure Name: LONG PARK D HGT NO 5 **Water District:** 40 **ID Number:** 1312

Source	ROUBIDEAU CREEK								*Acres Irrigated*	0
Location	Q160	Q40	Q10	Section	Twnshp		Range	PM	*CIU*	U
	SE	NW	SW	34	50	N	13 W	N		

Distance from section lines *From N/S line* *From E/W line*

UTM Coordinates (NAD 83) *Northing (UTM y)* 4272206 8 *Easting (UTM x)* 211835 2 *Spotted from PLSS quarters*

Latitude/Longitude (decimal degrees) 38 5516 -108 3067

Measuring Device/Recorder

Contact RUTLEDGE C/O COPPFER(OWNER) *Phone*

Address DELTA, COLO *Cell Phone*

E-mail

Water Rights Summary	*Total Decreed Rate(s)*	*Abs*	0.0000	*Cond*	0 5000	*AP/EX*	0 0000
	Total Decreed Volume(s)	*Abs*	0 0000	*Cond*	0 0000	*AP/EX*	0 0000

Water Rights -- Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin Number	O #	Priority Number	Decreed Amount	Adj Type	Uses	Comments
1	CA4808	1/31/1964	12/10/1958	39790 00000	0	K158D	0 5 C	S,C	18	P2806

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1981			NOT CONSTRUCTED
1983			NOT CONSTRUCTED
1984			NOT CONSTRUCTED
1985			NOT CONSTRUCTED
1986			NOT CONSTRUCTED
1987			0 CONDITIONAL
1988			0 CONDITIONAL DECREE
1989			0 CONDITIONAL DECREE
1990			0 CONDITIONAL DECREE
1991			0 CONDITIONAL DECREE
1992			0 CONDITIONAL DECREE
1993			0 CONDITIONAL DECREE

Structure Name: PUG WHITE DITCH **Water District:** 40 **ID Number:** 1313

Source ROUBIDEAU CREEK *Acres Irrigated:*

Location Q160 Q40 Q10 Section Twnshp Range PM *CIU.* A

SW NE SW 8 49 N 13 W N

Distance from section lines *From N/S line* *From E/W line*

UTM Coordinates (NAD 83) *Northing (UTM y).* 4269370 1 *Easting (UTM x)* 208026 9 *GPS*

Latitude/Longitude (decimal degrees) 38 5249 -108 3491

Measuring Device/Recorder.

Contact HANK DAVIS(MGR) *Phone*

Address. DELTA, COLO *Cell Phone*

E-mail

Water Rights Summary *Total Decreed Rate(s)* *Abs* 10 0000 *Cond* 0.0000 *AP/EX* 0 0000

Total Decreed Volume(s) *Abs* 0 0000 *Cond* 0 0000 *AP/EX* 0 0000

Water Rights -- Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin. Number	O #	Priority Number	Decreed Amount		Adj Type	Uses	Comments
1	CA5873	8/11/1969	4/4/1950	41668 36618	0	L41	5 C	S		1Q	COTTONWOOD CR ALSO STORAGE IN WHITE RES N(P3042
2	CA5873	8/11/1969	4/4/1950	41668 36618	0	L42	5 C	S		19	COTTONWOOD CR ACTUAL LOC RANGE 13 P3042

Diversion Summary in Acre-Feet - Total Water through Structure

IYR	FDU	LDU	DWC	Max Q	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Total
1983	05/20	08/18	91	3	0	0	0	0	0	0	71 4	178	184	107	0	0	541
1984	06/11	08/13	64	4 5	0	0	0	0	0	0	0	178	271	51 6	0	0	502
1985	06/05	08/21	78	9 2	0	0	0	0	0	0	0	90 2	77 9	367	0	0	536
1986	06/16	08/20	66	1 25	0	0	0	0	0	0	0	37 2	65 0	39 7	0	0	142
1987	05/08	08/18	103	2	0	0	0	0	0	0	95 2	71 4	69 9	26 8	0	0	263
1988	05/20	07/17	59	3	0	0	0	0	0	0	69 9	178	73 4	0	0	0	322
1989	04/19	08/07	111	2.5	0	0	0	0	0	59.5	99 6	54 7	30 7	6 94	0	0	252
1990	05/07	06/14	39	3	0	0	0	0	0	0	124	27 8	0	0	0	0	153
1991	05/08	06/19	43	1	0	0	0	0	0	0	47 6	37 7	0	0	0	0	85 3
1992	05/22	06/17	27	1	0	0	0	0	0	0	19 8	33 7	0	0	0	0	53 6
1993	05/20	08/09	82	10	0	0	0	0	0	0	238	380	101	17 9	0	0	738
1994	05/04	08/30	119	3 5	0	0	0	0	0	0	190	127	16 0	5 95	0	0	340
1996	04/30	08/20	72	3	0	0	0	0	0	5 95	166	0	11 4	9 92	0	0	194
1997	05/08	06/30	54	2	0	0	0	0	0	0	23 8	94 2	0	0	0	0	118
1998	05/01	07/22	83	3	0	0	0	0	0	0	77 4	81 5	4 36	0	0	0	163
1999	04/30	09/16	140	5	0	0	0	0	0	9 92	247	51 0	6 15	5 55	1 59	0	322
2000	04/29	07/10	73	3	0	0	0	0	0	11 9	97 2	13 7	1 98	0	0	0	125
2001	05/10	07/09	61	2	0	0	0	0	0	0	87 3	35 7	4 46	0	0	0	127
2002	04/30	05/15	16	0 25	0	0	0	0	0	0 50	7 44	0	0	0	0	0	7 93
2003	05/01	07/16	77	2	0	0	0	0	0	0	103	33 7	15 9	0	0	0	153
2004	04/01	05/19	49	0 5	0	0	0	0	0	29 8	18 8	0	0	0	0	0	48 6
		Minimum		0 25	0	0	0	0	0	0	0	0	0	0	0	0	7 93
		Maximum		10	0	0	0	0	0	59 5	247	380	271	367	1 59	0	737
		Average		3 081	0	0	0	0	0	5 60	85 1	81 3	44 5	30 4	0 08	0	246

1.25 1.25 0.75 0.5

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1983		200	

Structure Name: **PUG WHITE DITCH** ***Water District:*** **40** ***ID Number:*** **1313**

1984	200
1985	200
1987	100
1988	100
1989	100
1990	100
1991	100
1992	100
1993	100
1994	100
1995	0 DITCH WASHED OUT IN 1995
1996	0 DITCH WASHED OUT IN 1995
1997	0
1998	0
1999	0
2000	0
2001	0
2002	0
2003	0
2004	0

Structure Name: 25 MESA UP LIT MONITOR D **Water District:** 40 **ID Number:** 1319

1983		240
1984		240
1985		240
1987		240
1988		240
1989		240
1990		240
1991		240
1992		240
1993		240
1994		240
1995		240
1996		240
1997		240
1998		240
1999		240
2000		240
2001		240
2002	No water available	240
2003		240
2004		240

Structure Name: LONG PARK D HGT NO 1 **Water District:** 40 **ID Number:** 1308

Source	ROUBIDEAU CREEK								*Acres Irrigated*	0
Location	Q160	Q40	Q10	Section	Twnshp		Range	PM	*CIU*	U
	SE	SE	NE	5	49	N	13 W	N		

Distance from section lines *From N/S line* *From E/W line.*

UTM Coordinates (NAD 83) *Northing (UTM y)* 4270496.8 *Easting (UTM x)* 209171.1 *Spotted from PLSS quarters*

Latitude/Longitude (decimal degrees) 38 5354 -108 3365

Measuring Device/Recorder

Contact RUTLEDGE C/O COPPFER(OWNER) *Phone*

Address DELTA, COLO *Cell Phone*

E-mail

Water Rights Summary *Total Decreed Rate(s)* *Abs* 0 0000 *Cond* 8 0000 *AP/EX* 0 0000

Total Decreed Volume(s) *Abs* 0 0000 *Cond* 0 0000 *AP/EX* 0 0000

Water Rights -- Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin Number	O #	Priority Number	Decreed Amount		Adj Type	Uses	Comments
1	CA4808	1/31/1964	12/10/1958	39790 00000	0	K158	8	C	S,C	18	P2807

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1981			NOT CONSTRUCTED
1983			NOT CONSTRUCTED
1984			NOT CONSTRUCTED
1985			NOT CONSTRUCTED
1986			NOT CONSTRUCTED
1987		0	CONDITIONAL
1988		0	CONDITIONAL DECREE
1989		0	CONDITIONAL DECREE
1990		0	CONDITIONAL DECREE
1991		0	CONDITIONAL DECREE
1992		0	CONDITIONAL DECREE
1993		0	CONDITIONAL DECREE

Structure Name: BULL FROG RESERVOIR **Water District:** 40 **ID Number:** 3484

Source	ROUBIDEAU CREEK								*Acres Irrigated*	0
Location	Q160	Q40	Q10	Section	Twnshp		Range	PM	*CIU*	U
	SE	SE	NW	18	49	N	13 W	N		

Distance from section lines *From N/S line* *From E/W line*

UTM Coordinates (NAD 83) *Northing (UTM y)* 4267624 9 *Easting (UTM x)* 207211.0 *GPS*

Latitude/Longitude (decimal degrees) 38 5089 -108 3577

Measuring Device/Recorder

Contact ESTATE OF JOHN STERLING(OWNER) *Phone*

Address CARBONDALE COLO *Cell Phone*

E-mail

Water Rights Summary	*Total Decreed Rate(s)*	*Abs*	0 0000	*Cond.*	0 0000	*AP/EX*	0 0000	
	Total Decreed Volume(s).	*Abs*	140 0000	*Cond*	0 0000	*AP/EX*	0 0000	

Water Rights -- Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin Number	O #	Priority Number	Decreed Amount	Adj Type	Uses	Comments
1	CA2563	5/28/1937	5/1/1904	29260 19844	0	H22	140 A	S	1	DERIVES WATER THRU 25 MESA UPPER LITTLE MON D P1492

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1988	Water taken but no data available	0	
1989	Water taken but no data available	0	
1990	Water taken but no data available	0	
1991	Water taken but no data available	0	
1992	Water taken but no data available	0	
1993	Water taken but no data available	0	
1994	Water taken but no data available	0	
1995	Water taken but no data available	0	
1996	Water taken but no data available	0	
1997	Water taken but no data available	0	
1998	Water taken but no data available	0	
1999	Water taken but no data available	0	
2000	Water taken but no data available	0	
2001	Water taken but no data available	0	
2002	Water taken but no data available	0	
2003	Water taken but no data available	0	
2004	Water taken but no data available	0	

Structure Name: 25 MESA UP LIT MONITOR D **Water District:** 40 **ID Number:** 1319

Source	ROUBIDEAU CREEK							*Acres Irrigated*	
Location	Q160	Q40	Q10	Section	Twnshp	Range	PM	*CIU*	A
	SW	NW	SE	19	49 N	13 W	N		
Distance from section lines	*From N/S line*			*From E/W line*					
UTM Coordinates (NAD 83)	*Northing (UTM y)*	4265923 3		*Easting (UTM x)*	206224 0	*Spotted from PLSS quarters*			
Latitude/Longitude (decimal degrees)	38 4933			-108 3683					
Measuring Device/Recorder									

Contact	HANK DAVIS(OFFICIAL)	*Phone*	
Address	DELTA, COLO	*Cell Phone*	
		E-mail	

Water Rights Summary	*Total Decreed Rate(s)*	*Abs*	7 0000	*Cond*	0 0000	*AP/EX*	0 0000	
	Total Decreed Volume(s)	*Abs*	0 0000	*Cond*	0 0000	*AP/EX*	0 0000	

Water Rights – Transactions

Seq #	Case Number	Adjudication Date	Appropriation Date	Admin Number	O #	Priority Number	Decreed Amount		Adj. Type	Uses	Comments
1	CA2563	5/28/1937	6/1/1904	29260 19875	0	H49	7 C	S	1		P1296

Diversion Summary in Acre-Feet - Total Water through Structure

IYR	FDU	LDU	DWC	Max Q	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total
1979	06/17	07/21	35	2 5	0	0	0	0	0	0	0	69 4	104	0	0	0	174
1982	05/31	06/27	28	2	0	0	0	0	0	0	3 97	59 4	0	0	0	0	63 4
1983	05/22	08/18	89	5 5	0	0	0	0	0	0	109	327	338	196	0	0	971
1984	06/11	08/13	64	4	0	0	0	0	0	0	0	158	242	64 5	0	0	466
1985	06/05	08/21	78	1 8	0	0	0	0	0	0	0	92 8	92 8	62 5	0	0	248
1986	06/16	08/21	67	1 5	0	0	0	0	0	0	0	44 6	80 3	52 1	0	0	177
1987	05/08	06/18	42	2 5	0	0	0	0	0	0	112	19 3	0	0	0	0	131
1988	05/07	06/27	52	1 5	0	0	0	0	0	0	58 3	42 8	0	0	0	0	101
1989	03/31	06/18	80	5	0	0	0	0	5 55	218	140	35 7	0	0	0	0	401
1990	05/07	06/07	32	3	0	0	0	0	0	0	116	3 47	0	0	0	0	120
1991	05/08	06/19	43	6	0	0	0	0	0	0	245	37 7	0	0	0	0	284
1992	05/22	07/04	44	0 75	0	0	0	0	0	0	14 9	27 9	0 79	0	0	0	43 5
1993	05/20	07/04	46	5	0	0	0	0	0	0	119	243	31 7	0	0	0	395
1994	05/04	07/03	61	3	0	0	0	0	0	0	155	9 12	0 60	0	0	0	165
1995	05/10	07/19	71	2 5	0	0	0	0	0	0	109	148	94 2	0	0	0	352
1996	04/30	07/04	66	4	0	0	0	0	0	7 93	228	41 7	3 97	0	0	0	282
1997	05/08	06/30	54	8	0	0	0	0	0	0	380	173	0	0	0	0	554
1998	05/01	06/24	55	12	0	0	0	0	0	0	515	80 3	0	0	0	0	596
1999	04/15	06/23	70	8	0	0	0	0	0	17 4	372	28 8	0	0	0	0	419
2000	04/29	07/10	73	5	0	0	0	0	0	19 8	243	53 6	4 96	0	0	0	322
2001	04/28	07/09	66	6	0	0	0	0	0	35 7	172	0.95	0 36	0	0	0	210
2003	05/01	07/16	77	4	0	0	0	0	0	0	245	49 6	6 35	0	0	0	302
2004	04/01	06/07	68	4	0	0	0	0	0	119	150	1 39	0	0	0	0	271
		Minimum		0 75	0	0	0	0	0	0	0	0 95	0	0	0	0	43 5
		Maximum		12	0	0	0	0	5 55	218	515	327	338	196	0	0	970
		Average		4 2413	0	0	0	0	0 24	18 2	151	76 1	43 5	16 3	0	0	306

Diversion Comments

IYR	NUC Code	Acres Irrigated	Comments
1971	No information available	0	


1.6.2001

Fig. 1 - 6.2001

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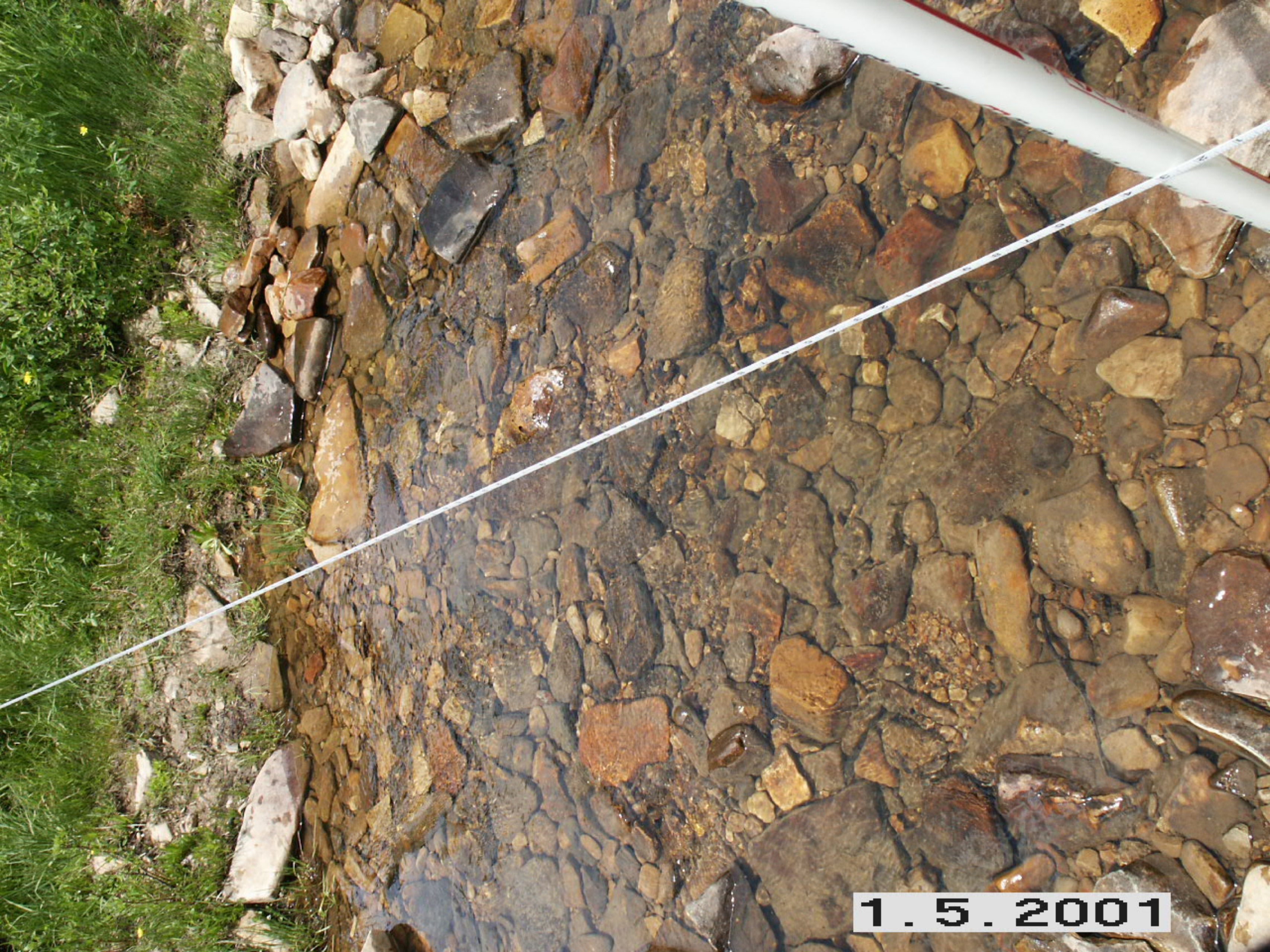
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1.6.2001

WD	ID	WRNAME	TRTYP	WRSTRM	WRSTRNAME	CTY	QUD	QAD	QTR	SEC	TS	RNG	PM	DETYP	DCRAMT	UR	ADJTYPE	ADJDATE	PADJDATE	APRDATE	RDM	ADMINNO	PRIORNO	CANO	SEQNO	LAP	ALTERID	COMMENT
40	5113	ANGEL SPRING WELL NO 1	2	5	ROUBIDEAU CREEK	43	SE	SE	NW	29	49 N	13 W	N	89	0.1000	C	O	12/31/1977		12/31/1907	0	21183.00000		W3077	1		0	W3077 ONE OF 4 SPGS SEE STIP TRIB TO MONITOR CR
40	5114	ANGEL SPRING WELL NO 2	2	5	ROUBIDEAU CREEK	43	NW	SE	NW	29	49 N	13 W	N	89	0.1000	C	O	12/31/1977		12/31/1907	0	21183.00000		W3078	1		0	W3078 ONE OF 4 SPRINGS SEE STIP TRIB TO MONITOR CR
40	5115	ANGEL SPRING WELL NO 3	2	5	ROUBIDEAU CREEK	43	SE	NW	NW	29	49 N	13 W	N	89	0.1000	C	O	12/31/1977		12/31/1907	0	21183.00000		W3079	1		0	W3079 ONE OF 4 SPRINGS SEE STIP TRIB TO MONITOR CR
40	5116	ANGEL SPRING WELL NO 4	2	5	ROUBIDEAU CREEK	43	SW	NW	NW	29	49 N	13 W	N	89	0.1000	C	O	12/31/1977		12/31/1907	0	21183.00000		W3080	1		0	W3080 ONE OF 4 SPRINGS SEE STIP TRIB TO MONITOR CR
40	1434	ENTERPRISE DITCH	1	5	ROUBIDEAU CREEK	43	SW	NW	SE	28	51 N	11 W	N	1	11.0000	C	S	06/23/1914	03/20/1908	12/10/1890	0	21263.14954	A17	CA0617	1		0	ALSO POINT OF DIVERSION ON BUTTERMILK GULCH. P304
40	1433	ESTEP DITCH	1	5	ROUBIDEAU CREEK	15	SW	NW	SW	17	51 N	11 W	N	1	1.1250	C	S	06/23/1914	03/20/1908	03/23/1897	0	21263.17249	A45	CA0617	1		0	, P336
40	1314	RINGWOOD DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	7	51 N	11 W	N	1	0.7500	C	S	06/23/1914	03/20/1908	03/23/1897	0	21263.17249	A45	CA0617	1		0	P337
40	1318	WARREN SNODDY DITCH	1	5	ROUBIDEAU CREEK	43	NW	NW	NW	28	51 N	11 W	N	1	0.8750	C	S	08/28/1920	02/27/1918	03/05/1892	0	24894.15405	B4	CA1424	1		0	P735
40	2418	EVERLASTING DITCH	1	5	ROUBIDEAU CREEK	43	NE	NE	SW	24	49 N	14 W	N	1	4.7500	C	S	02/10/1930	08/28/1920	12/01/1901	0	25807.18962	G32	CA2030	1		0	ACTUAL LOC IN PRINTOUT CORRECT LOC IN DECREE IN ERROR 925
40	7159	7 N SPRING	4	5	ROUBIDEAU CREEK	43	SW	NW	NE	5	49 N	12 W	N	9W	0.0310	C	O	12/31/1972		04/17/1926	0	27865.00000		W0425-438	1		0	
40	7161	LONG GULCH SPRING NO 1	4	5	ROUBIDEAU CREEK	43	NE	NE	SE	36	50 N	13 W	N	9W	0.0220	C	O	12/31/1972		04/17/1926	0	27865.00000		W0425-438	1		0	
40	7156	MONITOR SPRING NO 1	4	5	ROUBIDEAU CREEK	43	NE	SE	NE	31	50 N	12 W	N	9W	0.0110	C	O	12/31/1972		04/17/1926	0	27865.00000		W0425-438	1		0	
40	7160	POTTER SPRING	4	5	ROUBIDEAU CREEK	43	SE	SW	NW	32	50 N	12 W	N	9W	0.0178	C	O	12/31/1972		04/17/1926	0	27865.00000		W0425-438	1		0	
40	1436	HALLEY DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	17	51 N	11 W	N	1	2.0000	C	S	05/28/1937	02/10/1930	06/01/1896	0	29260.16954	H23	CA2563	1		0	P1259
40	3494	LONE PINE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	NW	9	49 N	13 W	N	1	10.0000	A	S	05/28/1937	02/10/1930	04/01/1904	0	29260.19814	H21	CA2563	1		0	ACTUAL LOC NE/SE/NE/ SEC 9 T49N R13W. P1490
40	3481	BEAVER RESERVOIR	3	5	ROUBIDEAU CREEK	43			NW	17	49 N	13 W	N	1	20.0000	A	S	05/28/1937	02/10/1930	05/01/1904	0	29260.19844	H22	CA2563	1		0	DERIVES WATER THRU 25 MESA UPPER LITTLE MONITOR D P1492
40	3484	BULL FROG RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	SE	18	49 N	13 W	N	1	140.0000	A	S	05/28/1937	02/10/1930	05/01/1904	0	29260.19844	H22	CA2563	1		0	DERIVES WATER THRU 25 MESA UPPER LITTLE MONITOR D P1492
40	1319	25 MESA UP LIT MONITOR D	1	5	ROUBIDEAU CREEK	43	SE	NW	SW	19	49 N	13 W	N	1	7.0000	C	S	05/28/1937	02/10/1930	06/01/1904	0	29260.19875	H49	CA2563	1		0	P1296
40	1321	DARLEY DITCH	1	5	ROUBIDEAU CREEK	15	NE	NW	SW	29	15 S	96 W	S	1	0.7500	C	S	05/28/1937	02/10/1930	01/16/1908	0	29260.21199	H67	CA2563	1		0	P1328
40	1307	LITTLE MONITOR DITCH	1	5	ROUBIDEAU CREEK	43	NE	SE	SW	9	49 N	13 W	N	1	2.0000	C	S	05/28/1937	02/10/1930	04/01/1914	0	29260.23468	H94	CA2563	1		0	P1373
40	1307	LITTLE MONITOR DITCH	1	5	ROUBIDEAU CREEK	43	NE	SE	SW	9	49 N	13 W	N	1	2.0000	C	S,C	05/28/1937	02/10/1930	04/01/1914	0	29260.23468	H94	CA2563	2		0	P1373
40	1307	LITTLE MONITOR DITCH	1	5	ROUBIDEAU CREEK	43	NE	SE	SW	9	49 N	13 W	N	1	2.0000	C	S,CA	05/28/1937	02/10/1930	04/01/1914	0	29260.23468	H94	CA2563	3		0	CA 5/3/1948 P3403
40	3493	LITTLE MONITOR RES NO 2	3	5	ROUBIDEAU CREEK	43	SE	SE	SE	4	49 N	13 W	N	1	40.0000	A	S	05/28/1937	02/10/1930	04/21/1914	0	29260.23486	H45	CA2563	1		0	P1542
40	3492	LITTLE MONITOR RES NO 1	3	5	ROUBIDEAU CREEK	43		SW	SE	9	49 N	13 W	N	1	115.0000	A	S,CA	05/28/1937	02/10/1930	05/01/1914	0	29260.23496	H46	CA2563	3		0	CA 5/3/1948 P3405
40	3492	LITTLE MONITOR RES NO 1	3	5	ROUBIDEAU CREEK	43		SW	SE	9	49 N	13 W	N	1	15.0000	A	S	05/28/1937	02/10/1930	05/01/1914	0	29260.23496	H46	CA2563	1		0	P1543
40	3492	LITTLE MONITOR RES NO 1	3	5	ROUBIDEAU CREEK	43		SW	SE	9	49 N	13 W	N	1	115.0000	A	S,C	05/28/1937	02/10/1930	05/01/1914	0	29260.23496	H46	CA2563	2		0	P1543
40	1314	RINGWOOD DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	7	51 N	11 W	N	1	1.0000	C	S	05/28/1937	02/10/1930	09/28/1914	0	29260.23646	H98	CA2563	2		0	P1381
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47 N	12 W	N	1	9.3000	C	S	05/28/1937	02/10/1930	04/24/1917	0	29260.24585	H107	CA2563	1		0	HAS TWO HGTS P1389
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47 N	12 W	N	1	8.0000	C	S,C	05/28/1937	02/10/1930	04/24/1917	0	29260.24585	H107	CA2563	2		0	P1389
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47 N	12 W	N	1	8.0000	C	S,C,AB	05/28/1937	02/10/1930	04/24/1917	0	29260.24585	H107	75CW0166	3		0	8.00CFS ABANDONED BY CW \74\166 03/06/1975
40	1316	STOCKHAM DITCH	1	5	ROUBIDEAU CREEK	15	NE	NW	NW	33	51 N	11 W	N	1	2.0000	C	S,C	05/28/1937	02/10/1930	08/15/1921	0	29260.26159	H125	CA2563	1		0	P1412
40	1316	STOCKHAM DITCH	1	5	ROUBIDEAU CREEK	15	NE	NW	NW	33	51 N	11 W	N	1	2.0000	C	S,C,AB	05/28/1937	02/10/1930	08/15/1921	0	29260.26159	H125	75CW0171	2		0	2.00CFS ABANDONED BY CW \75\171 03/07/1975
40	3496	PINE TRAIL RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	NW	18	49 N	13 W	N	1	30.0000	A	S	05/28/1937	02/10/1930	05/01/1922	0	29260.26418	H51	CA2563	1		0	P1548
40	3496	PINE TRAIL RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	NW	18	49 N	13 W	N	1	40.0000	A	S,C	05/28/1937	02/10/1930	05/01/1922	0	29260.26418	H51	CA2563	2		0	, P1548
40	3496	PINE TRAIL RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	NW	18	49 N	13 W	N	1	35.0000	A	S,CA	05/28/1937	02/10/1930	05/01/1922	0	29260.26418	H51	W2523	3		0	TO ABSOLUTE W2523 12/23/1975 PART
40	3496	PINE TRAIL RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	NW	18	49 N	13 W	N	1	5.0000	A	S,C,AB	05/28/1937	02/10/1930	05/01/1922	0	29260.26418		W2523	4		0	CANCELED BY THE COURT 8/11/80
40	3485	CASTLE ROCK RESERVOIR	3	5	ROUBIDEAU CREEK	43	SE	NE	NW	18	49 N	13 W	N	1	12.0000	A	S	05/28/1937	02/10/1930	05/01/1925	0	29260.27514	H53	CA2563	1		0	P1551
40	3485	CASTLE ROCK RESERVOIR	3	5	ROUBIDEAU CREEK	43	SE	NE	NW	18	49 N	13 W	N	1	27.0000	A	S,C	05/28/1937	02/10/1930	05/01/1925	0	29260.27514	H53	CA2563	2		0	P1551
40	3485	CASTLE ROCK RESERVOIR	3	5	ROUBIDEAU CREEK	43	SE	NE	NW	18	49 N	13 W	N	1	21.0000	A	S,CA	05/28/1937	02/10/1930	05/01/1925	0	29260.27514	H53	W2524	3		0	TO ABSOLUTE PART CA W2524 12/23/1975
40	1325	NORTH FORK DITCH	1	5	ROUBIDEAU CREEK	43	SE	NE	SE	27	50 N	14 W	N	1	3.0000	C	S	05/28/1937	02/10/1930	06/15/1925	0	29260.27559	H138	CA2563	1		0	P1428
40	3498	ROUND PARK RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	SW	SE	7	49 N	13 W	N	1	43.0000	A	S	05/28/1937	02/10/1930	04/15/1930	0	29324.00000	H63	CA2563	1		0	P1561
40	3498	ROUND PARK RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	SW	SE	7	49 N	13 W	N	1	42.0000	A	S,CA	05/28/1937	02/10/1930	04/15/1930	0	29324.00000	H63	CA2563	2		0	CA 3/18/1966 P3431
40	3498	ROUND PARK RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	SW	SE	7	49 N	13 W	N	1	42.0000	A	S,C	05/28/1937	02/10/1930	04/15/1930	0	29324.00000	H63	CA2563	3		0	1561
40	1324	NOAH R WHITE DITCH	1	5	ROUBIDEAU CREEK	43		NW	SE	9	49 N	13 W	N	1	3.0000	C	S	05/28/1937	02/10/1930	07/22/1932	0	30153.00000	H155	CA2563	1		0	P1448
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49 N	14 W	N	1	3.0000	C	S,C	05/28/1937	02/10/1930	08/07/1935	0	31264.00000	H164	CA2563	1		0	P1457
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49 N	14 W	N	1	3.0000	C	S,C,AB	05/28/1937	02/10/1930	08/07/1935	0	31264.00000	H164	75CW0206	7		0	390CFS ABANDOND BY CW \74\206 03/07/1975
40	3486	EARL D WHITE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	SE	24	49 N	13 W	N	1	114.0000	A	S,C	05/28/1937	02/10/1930	08/07/1935	0	31264.00000	H75	CA2563	1		0	ACTUAL LOC IN RANGE 14. P1573
40	3486	EARL D WHITE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	SE	24	49 N	13 W	N	1	57.0000	A	S,CA	05/28/1937	02/10/1930	08/07/1935	0	31264.00000	H75	CA2563	2		0	CA 5/3/1948 ACTUAL LOC IN RNG 14 CA 5/3/1948 P4306
40	3486	EARL D WHITE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SE	SE	24	49 N	13 W	N	1	57.0000	A	S,C,AB	05/28/1937	02/10/1930	08/07/1935	0	31264.00000	H75	75CW0186	3		0	ACTUAL LOC IN R14 57.00A ABANDONED BY CW \74\186 3/7/1975
40	1320	BUTTER MILK DRAW DITCH	1	5	ROUBIDEAU CREEK	43	SW	SE	SE	21	51 N	11 W	N	1	0.3200	C	S	05/28/1937	02/10/1930	09/01/1935	0	31289.00000	H165	CA2563	1		0	P1458
40	3489	HARRY WHITE NO 1 RES	3	5	ROUBIDEAU CREEK	43	NE	NE	SW	5	49 N	13 W	N	1	15.0000	A	S	03/20/1954	05/28/1937	06/01/1908	0	31924.21336	J127	CA3503	1		0	LOC NOT CORRECT. P1932
40	1426	BIG MONITOR NO 1 DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NE	21	49 N	13 W	N	1	15.0000	C	S	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J166	CA3503	1		0	P1984
40	1426	BIG MONITOR NO 1 DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NE	21	49 N	13 W	N	18Q	27.3500	C	S	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J165	CA3503	2		0	FOR STORAGE MONITOR NO2 RES A NO1. P1984
40	1426	BIG MONITOR NO 1 DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NE	21	49 N	13 W	N	8	2.0000	C	S	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J167	CA3503	3		0	P1984
40	1426	BIG MONITOR NO 1 DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NE	21	49 N	13 W	N	1	7.5000	C	S,C	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J166	CA3503	4		0	CA 9/21/1970 P3496
40	1426	BIG MONITOR NO 1 DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NE	21	49 N	13 W	N	1	7.5000	C	S,CA	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J166	CA3503	5		0	CA 9/21/1970 P3496
40	3482	BIG MONITOR RES NO 1	3	5	ROUBIDEAU CREEK	43	SE	SW	NW	15	49 N	13 W	N	18	70.5000	A	S	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J168	CA3503	1		0	RES FILLED BY BIG MONITOR D NO1. P1988
40	3483	BIG MONITOR RES NO 2	3	5	ROUBIDEAU CREEK	43	SW	SE	SE	10	49 N	13 W	N	18	64.5000	A	S	03/20/1954	05/28/1937	04/26/1918	0	31924.24952	J169	CA3503	2		0	THIS RES TO BE FILLED BY BIG MONITOR D NO1. P1990
40	3495	MIDDLE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	NE	NW	15	49 N	13 W	N	18	13.0000	A	S,C	03/20/1954	05/28/1937	05/12/1928	0	31924.28621	J188	CA3503	2		0	P2017
40	3495	MIDDLE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	NE	NW	15	49 N	13 W	N	18	39.0000	A	S	03/20/1954	05/28/1937	05/12/1928	0	31924.28621	J188	CA3503	3		0	P2017
40	3495	MIDDLE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	NE	NW	15	49 N	13 W	N	18	13.0000	A	S,CA	03/20/1954	05/28/1937	05/12/1928	0	31924.28621	J188	CA3503	1		0	, CA 7/9/1962 P2368
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	189	20.0000	C	S,C	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J202	CA3503	1		0	STORAGE TO MIDDLE A BIG MONITOR RES NO2. P2032
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	89	2.0000	C	S,CA	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J203	CA3503	2		0	CA 7/9/1962. P2365
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	10.0000	C	S,C	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	CA3503	3		0	NOT TO EXCEED 20.00C CONJ WITH BIG MONITOR D NO1 P2032
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	5.0000	C	S,C	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	CA3503	4		0	NOT TO EXCEED 10.00C CONJ WITH BIG MONITOR D NO1. P2032
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	189	20.0000	C	S,CA	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J202	CA3503	5		0	STORAGE TO MIDDLE^BIG MONITON RES NO2 CA7/9/1962. P2365
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	89	2.0000	C	S,C	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J203	CA3503	6		0	P2032
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	1.5000	C	S,CA	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	CA3503	7		0	NOT TO EXCEED 10CFS CONJ WITH BIG MONITOR D NO 1 P2365
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	3.5000	C	S,C,AB	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	75CW0197	8		0	3.50CFS ABANDONED BY CW \74\197 03/07/1975
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	10.0000	C	S,CA	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	CA3503	9		0	P2365 CA7-9-1962
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	10.0000	C	S,AB	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	91CW0123	10		0	ABANDONED BY COURT 12/23/1992
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	189	20.0000	C	S,AB	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J202	91CW0123	11		0	ABANDONED BY COURT 12/23/1992
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	1	1.5000	C	S,AB	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J201	91CW0123	12		0	ABANDONED BY COURT 12/23/1992
40	1432	ED LEE DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	SE	16	49 N	13 W	N	89	2.0000	C	S,AB	03/20/1954	05/28/1937	05/15/1932	0	31924.30085	J203	91CW0123	13		0	ABANDONED BY COURT 12/23/1992
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49 N	14 W	N	8	1.0000	C	S,AB	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J215	91CW0123	8		0	ABANDONED BY COURT 12/23/1992
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49 N	14 W	N	1	5.0000	C	S,C,AB	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J214	91CW0123	9		0	ABANDONED BY COURT 12/23/1992

40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49	N	14	W	N	189	10.0000	C	S,AB	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J216	91CW0123	10		0	ABANDONED BY COURT 12/23/1992
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49	N	14	W	N	8	1.0000	C	S	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J215	CA3503	2		0	P2057
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49	N	14	W	N	1	5.0000	C	S,C	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J214	CA3503	3		0	P2057
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49	N	14	W	N	1	5.0000	C	S	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J214	CA3503	4		0	P2057
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49	N	14	W	N	89	10.0000	C	S	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J216	CA3503	5		0	FOR STORAGE IN LITTLE MONITOR RES NO1 A 2. P2057
40	1431	EARL D WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	49	N	14	W	N	1	5.0000	C	S,AB	03/20/1954	05/28/1937	08/10/1935	0	31924.31267	J214	75CW0185	6		0	5.00CFS ABANDONED BY CW \74\185 03/07/1975
40	3491	HOG TRAIL RESERVOIR	3	5	ROUBIDEAU CREEK	43	SE	NW	SE	25	50	N	12	W	N	9	1.2500	A	S	03/20/1954	05/28/1937	04/25/1936	0	31924.31536	J217	CA3503	1		0	P2061
40	3497	ROUBIDEAU RESERVOIR	3	5	ROUBIDEAU CREEK	43	NW	SW	SW	8	50	N	11	W	N	9	1.1000	A	S	03/20/1954	05/28/1937	07/25/1936	0	31924.31617	J219	CA3503	1		0	P2063 STORAGE FOR STOCK WATER
40	3514	25 MESA RESERVOIR	3	5	ROUBIDEAU CREEK	43	SE	NW	NE	26	51	N	12	W	N	9	1.7000	A	S	03/20/1954	05/28/1937	04/29/1937	0	31924.31895	J224	CA3503	1		0	P2069
40	1436	HALLEY DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	17	51	N	11	W	N	1	4.0000	C	S	03/20/1954	05/28/1937	05/01/1939	0	32627.00000	J236	CA3503	2		0	P2082
40	1436	HALLEY DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	17	51	N	11	W	N	1	1.5000	C	S,C	03/20/1954	05/28/1937	05/01/1939	0	32627.00000	J236	CA3503	3		0	P2082
40	1436	HALLEY DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	17	51	N	11	W	N	1	1.5000	C	S,C,AB	03/20/1954	05/28/1937	05/01/1939	0	32627.00000	J236	75CW0208	4		0	1.50CFS ABANDONED BY CW \74\208 03/07/1975
40	3499	STONE BASIN RESERVOIR	3	5	ROUBIDEAU CREEK	43	SW	SW	NE	31	51	N	12	W	N	89	1.8000	A	S	03/20/1954	05/28/1937	06/01/1944	0	34485.00000	J252	CA3503	1		0	P2102
40	3482	BIG MONITOR RES NO 1	3	5	ROUBIDEAU CREEK	43	SE	SW	NW	15	49	N	13	W	N	18	22.5000	A	S	03/20/1954	05/28/1937	08/14/1945	0	34924.00000	J259	CA3503	2		0	THIS RES TO BE FILLED BY BIG MONITOR D NO1. P1988
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	8	1.0000	C	S	03/20/1954	05/28/1937	09/01/1947	0	35672.00000	J289	CA3503	1		0	,P2144
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	1	7.8400	C	S,C	03/20/1954	05/28/1937	09/01/1947	0	35672.00000	J288	CA3503	2		0	P2144
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	1	2.1600	C	S	03/20/1954	05/28/1937	09/01/1947	0	35672.00000	J288	CA3503	3		0	P2144
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	1	7.8400	C	S,CA	03/20/1954	05/28/1937	09/01/1947	0	35672.00000	J288	CA3503	6		0	CA 7/29/1964 P3489
40	3490	HARRY WHITE RES NO 2	3	5	ROUBIDEAU CREEK	43	NE	NE	NE	5	49	N	13	W	N	1	131.0000	A	S,C	03/20/1954	05/28/1937	03/15/1948	0	35868.00000	J299	CA3503	1		0	P2155
40	3490	HARRY WHITE RES NO 2	3	5	ROUBIDEAU CREEK	43	NE	NE	NE	5	49	N	13	W	N	1	40.0000	A	S	03/20/1954	05/28/1937	03/15/1948	0	35868.00000	J299	CA3503	2		0	P2155
40	3490	HARRY WHITE RES NO 2	3	5	ROUBIDEAU CREEK	43	NE	NE	NE	5	49	N	13	W	N	1	131.0000	A	S,CA	03/20/1954	05/28/1937	03/15/1948	0	35868.00000	J299	CA3503	3		0	CA 7/29/1964 P3485
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	189	15.0000	C	S,CA	03/20/1954	05/28/1937	04/01/1948	0	35885.00000	J300	CA3503	7		0	CA 7/29/1964 P3488
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	189	15.0000	C	S,C	03/20/1954	05/28/1937	04/01/1948	0	35885.00000	J300	CA3503	4		0	FOR STORAGE IN HARRY WHITE RES 1+2 TWIN LAKE RES. P2144
40	1437	HAWKINS DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	189	5.0000	C	S	03/20/1954	05/28/1937	04/01/1948	0	35885.00000	J300	CA3503	5		0	FOR STORAGE IN HARRY WHITE RES 1+2 TWIN LAKE RES. P2144
40	3512	TWIN LAKE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	NE	SE	7	49	N	13	W	N	1	10.0000	A	S	03/20/1954	05/28/1937	04/01/1948	0	35885.00000	J301	CA3503	1		0	P2157
40	3512	TWIN LAKE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	NE	SE	7	49	N	13	W	N	1	146.0000	A	S,C	03/20/1954	05/28/1937	04/01/1948	0	35885.00000	J301	CA3503	2		0	P2157
40	3512	TWIN LAKE RESERVOIR	3	5	ROUBIDEAU CREEK	43	NE	NE	SE	7	49	N	13	W	N	1	146.0000	A	S,CA	03/20/1954	05/28/1937	04/01/1948	0	35885.00000	J301	CA3503	3		0	CA 7/29/1964 P3490
40	3489	HARRY WHITE NO 1 RES	3	5	ROUBIDEAU CREEK	43	NE	NE	SW	5	49	N	13	W	N	1	71.0000	A	S,C	03/20/1954	05/28/1937	06/25/1948	0	35970.00000	J316	CA3503	2		0	LOC NOT CORRECT. P1932
40	3489	HARRY WHITE NO 1 RES	3	5	ROUBIDEAU CREEK	43	NE	NE	SW	5	49	N	13	W	N	1	71.0000	A	S,CA	03/20/1954	05/28/1937	06/25/1948	0	35970.00000	J316	CA3503	3		0	CA 7/29/1964 P3486
40	3511	TABLE ROCK RESERVOIR	3	5	ROUBIDEAU CREEK	43	SW	SW	NE	5	49	N	13	W	N	1	20.0000	A	S,CA	03/20/1954	05/28/1937	05/01/1949	0	36280.00000	J337	CA3503	2		0	CA 7/29/1964 P3491
40	3511	TABLE ROCK RESERVOIR	3	5	ROUBIDEAU CREEK	43	SW	SW	NE	5	49	N	13	W	N	1	82.0000	A	S,C	03/20/1954	05/28/1937	05/01/1949	0	36280.00000	J337	CA3503	1		0	FROM COTTONWOOD CR P2198
40	3483	BIG MONITOR RES NO 2	3	5	ROUBIDEAU CREEK	43	SW	SE	SE	10	49	N	13	W	N	1	31.5000	A	S,CA	03/20/1954	05/28/1937	04/28/1950	0	36642.00000	J361	CA3503	1		0	CA 7/9/1962. P2364
40	3483	BIG MONITOR RES NO 2	3	5	ROUBIDEAU CREEK	43	SW	SE	SE	10	49	N	13	W	N	18	31.5000	A	S	03/20/1954	05/28/1937	04/28/1950	0	36642.00000	J361	CA3503	3		0	THIS RES TO BE FILLED BY BIG MONITOR D NO1. P1990
40	3483	BIG MONITOR RES NO 2	3	5	ROUBIDEAU CREEK	43	SW	SE	SE	10	49	N	13	W	N	1	31.5000	A	S,C	03/20/1954	05/28/1937	04/28/1950	0	36642.00000	J361	CA3503	4		0	THIS RES TO BE FILLED BY BIG MONITOR D NO1. P1990
40	1819	HOCKER DITCH	1	5	ROUBIDEAU CREEK	15	SW	SW	SW	7	51	N	11	W	N	1	2.0000	C	S	03/20/1954	05/28/1937	05/01/1950	0	36645.00000	J363	CA3503	1		0	P2231
40	1306	LITTLE BUTTERMILK DITCH	1	5	ROUBIDEAU CREEK	15	SE	NW	NE	20	51	N	11	W	N	1	2.0000	C	S,C,AB	03/20/1954	05/28/1937	03/14/1951	0	36962.00000	J386	75CW0248	2		0	2.00CFS ABANDONED BY CW \74\248 03/10/1975
40	1306	LITTLE BUTTERMILK DITCH	1	5	ROUBIDEAU CREEK	15	SE	NW	NE	20	51	N	11	W	N	1	2.0000	C	S,C	03/20/1954	05/28/1937	03/14/1951	0	36962.00000	J386	CA3503	1		0	P2257
40	5175	SMITH WELL 1	2	5	ROUBIDEAU CREEK	43	NE	NE	NE	29	51	N	11	W	N	8	0.0330	C	O	12/31/1972		05/01/1952	0	37376.00000		W1132	1		0	NO WELL PERMIT
40	1428	DAVIS BROS DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	NW	34	49	N	14	W	N	1	2.0000	C	S	01/31/1964	03/20/1954	06/07/1951	0	38064.37047	K100	CA4808	1		0	DIV FROM POLE BRIDGE CR. P2694
40	1429	DAVIS SEEPAGE D NO 1	1	5	ROUBIDEAU CREEK	15	SE	NW	SE	18	51	N	11	W	N	1	5.0000	C	S	01/31/1964	03/20/1954	01/14/1952	0	38064.37268	K103	CA4808	1		0	P2700
40	1430	DAVIS SEEPAGE D NO 2	1	5	ROUBIDEAU CREEK	15	NW	NE	SW	18	51	N	11	W	N	1	4.0000	C	S	01/31/1964	03/20/1954	01/14/1952	0	38064.37268	K104	CA4808	1		0	FROM BUTTERMILK CR. P2702
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	3.1900	C	S,C,AB	01/31/1964	03/20/1954	04/01/1955	0	38441.00000	K122	75CW0259	6		0	3.19CFS ABANDONED BY CW \74\259 03/11/1975
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	3.5000	C	S	01/31/1964	03/20/1954	04/01/1955	0	38441.00000	K122	CA4808	2		0	FROM BUTTERMILD CR. P2738
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	5.5000	C	S,C	01/31/1964	03/20/1954	04/01/1955	0	38441.00000	K122	CA4808	3		0	FROM BUTTERMILK CR. P2738
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	89	2.0000	C	S	01/31/1964	03/20/1954	04/01/1955	0	38441.00000	K123	CA4808	4		0	FROM BUTTERMILK CR. P2738
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	2.0000	C	S,CA	01/31/1964	03/20/1954	04/01/1955	0	38441.00000	K122	CA4808	5		0	CA 2/6/1970 PG 3563
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	0.3100	C	S,CA	01/31/1964	03/20/1954	04/01/1955	0	38441.00000	K122	CA4808	1		0	CA 3/13/1968 P 3557
40	1308	LONG PARK D HGT NO 1	1	5	ROUBIDEAU CREEK	43	NE	SE	SE	5	49	N	13	W	N	18	8.0000	C	S,C	01/31/1964	03/20/1954	12/10/1958	0	39790.00000	K158	CA4808	1		0	P2807
40	1309	LONG PARK D HGT NO 2	1	5	ROUBIDEAU CREEK	43	SE	NW	SW	4	49	N	13	W	N	18	0.2500	C	S,C	01/31/1964	03/20/1954	12/10/1958	0	39790.00000	K158A	CA4808	1		0	,P2807
40	1310	LONG PARK D HGT NO 3	1	5	ROUBIDEAU CREEK	43	SE	NE	NE	4	49	N	13	W	N	1	0.2500	C	S,C	01/31/1964	03/20/1954	12/10/1958	0	39790.00000	K158B	CA4808	1		0	FROM HGT NO 3. P2806
40	1311	LONG PARK D HGT NO 4	1	5	ROUBIDEAU CREEK	43	SE	SW	SW	34	50	N	13	W	N	18	0.2500	C	S,C	01/31/1964	03/20/1954	12/10/1958	0	39790.00000	K158C	CA4808	1		0	,P2806
40	1312	LONG PARK D HGT NO 5	1	5	ROUBIDEAU CREEK	43	SW	NW	SE	34	50	N	13	W	N	18	0.5000	C	S,C	01/31/1964	03/20/1954	12/10/1958	0	39790.00000	K158D	CA4808	1		0	,P2806
40	1428	DAVIS BROS DITCH	1	5	ROUBIDEAU CREEK	43	NE	SW	NW	34	49	N	14	W	N	1	10.0000	C	S	01/31/1964	03/20/1954	04/13/1959	0	39914.00000	K165	CA4808	2		0	DIVR FROM POLE BRIDGE, CR. P2822
40	3513	25 MESA RES NO 1	3	5	ROUBIDEAU CREEK	43	NW	SE	NE	25	49	N	14	W	N	9	0.5000	A	S	01/31/1964	03/20/1954	06/15/1960	0	40343.00000	K173	CA4808	1		0	P2841
40	5035	HONOR CAMP NO 1 WELL	2	5	ROUBIDEAU CREEK	15		NE	NE	32	15	S	96	W	S	8	0.0310	C	O	12/31/1972		01/24/1964	0	41661.00000		W1198	1		0	PERMIT NO P18484 FILED 6/30/1972 CA/W1198
40	1305	JOKER DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NW	16	49	N	13	W	N	89	0.5000	C	S	08/11/1969	01/31/1964	08/01/1932	0	41668.30163	L26	CA5873	2		0	LITTLE MONITOR CR. P3002
40	1305	JOKER DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	NW	16	49	N	13	W	N	1	1.0000	C	S	08/11/1969	01/31/1964	08/01/1932	0	41668.30163	L25	CA5873	1		0	LITTLE MONITOR CR. P3002
40	1313	PUG WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SW	NE	SW	8	49	N	13	W	N	1Q	5.0000	C	S	08/11/1969	01/31/1964	04/04/1950	0	41668.36618	L41	CA5873	1		0	COTTONWOOD CR ALSO STORAGE IN WHITE RES NO2. P3042
40	1313	PUG WHITE DITCH	1	5	ROUBIDEAU CREEK	43	SW	NE	SW	8	49	N	13	W	N	19	5.0000	C	S	08/11/1969	01/31/1964	04/04/1950	0	41668.36618	L42	CA5873	2		0	COTTONWOOD CR ACTUAL LOC RANGE 13. P3042
40	1427	DAD'S DESIRE DITCH	1	5	ROUBIDEAU CREEK	43	NW	NW	NE	21	49	N	13	W	N	19	2.3000	C	S	08/11/1969	01/31/1964	05/13/1959	0	41668.39944	L52	CA5873	1		0	MONITOR CR TRIB TO ROUBIDEAUX CR. P3070
40	1427	DAD'S DESIRE DITCH	1	5	ROUBIDEAU CREEK	43	NW	NW	NE	21	49	N	13	W	N	9	1.0000	C	S	08/11/1969	01/31/1964	05/13/1959	0	41668.39944	L53	CA5873	2		0	MONITOR CR TRIB TO ROUBIDEAUX. P3070
40	1435	EVERLASTING DITCH	1	5	ROUBIDEAU CREEK	43	SW	SW	NE	18	49	N	13	W	N	19	22.2500	C	S	08/11/1969	01/31/1964	07/01/1964	0	41820.00000	L71	CA5873	1		0	COTTONWOOD CR TRIB ROUBIDEAUX CR. P3109
40	1323	HORTON DAVIS SEP D ENLT	1	5	ROUBIDEAU CREEK	43	SW	NE	NW	9	49	N	13	W	N	19	6.0000	C	S	08/11/1969	01/31/1964	11/16/1966	0	42688.00000	L86	CA5873	1		0	COTTONWOOD CR T ROUBIDEAU. P3152
40	1303	HONOR CAMP PL	7	5	ROUBIDEAU CREEK	15	SW	SW	NE	32	15	S	96	W	S	78	0.4000	C	S	08/11/1969	01/31/1964	01/19/1967	0	42752.00000	L90	CA5873	1		0	P3161
40	1315	ROUBIDEAU POND DITCH	1	5	ROUBIDEAU CREEK	15	SE	SE	SE	19	15	S	96	W	S	56	2.0000	C	S	08/11/1969	01/31/1964	01/24/1967	0	42757.00000	L91	CA5873	1		0	ROUBIDEAU CR. P3163
40	5036	HONOR CAMP NO 2 WELL	2	5	ROUBIDEAU CREEK	15		NW	SW	20	15	S	96	W	S	8	0.0130	C	O	12/31/1972		03/20/1967	0	42812.00000		W1199	1		0	PERMIT NO 30357 FILED 6/30/1972 CA/W1192
40	5037	WRIGHT NO 1 WELL	2	5	ROUBIDEAU CREEK	43		SE	SW	28	51	N	11	W	N	8	0.0670	C	O	12/31/1972		05/21/1970	0	43970.00000		W0786	1		0	PERMIT NO 41324 FILED 6/14/1972 CA/W786
40	1322	HI RANCH SPRING PIPELINE	7	5	ROUBIDEAU CREEK	43	NE	NW	SE	9	49	N	13	W	N	8	0.0330	C	S	12/31/1976	12/31/1975	12/31/1901	0	46020.18992		W2763	1		0	IN DRAINAGE AREA OF MONITOR CR
40	1849	EARLS WASTE WATER DITCH	1	5	ROUBIDEAU CREEK	43	SW	SE	NW	4	50	N	11	W	N	1	1.5000	C	S	12/31/1977	12/31/1976	04/01/1940	0	46386.32963		W3074	1		0	W3074
40	2161	MURRAY SPRING PIPELINE	4	5	ROUBIDEAU CREEK	43	NE	NW	NE	31	49	N	13	W	N	89	0.0330	C	S	12/31/1980	12/31/1979	07/01/1910	0	47481.22096		80CW0372	1		0	
40	2165	SEDER WASTE WATER DITCH	1	5	ROUBIDEAU CREEK	15	SW	SE	SW	27	51	N	11	W	N	1	1.0000	C	S	12/31/1980	12/31/1979	03/15/1960	0	47481.40251		80CW0430	1		0	
40	2182	SMITH WASTEWATER DITCH	1	5	ROUBIDEAU CREEK	43	NW	SE	NW	33	51	N	11	W	N	1	1.0000	C	S	12/31/1981	12/31/1980	04/15/1972	0	47847.44665		81CW0111	1		0	
40	2184	6 R DITCH NO 1	1	5	ROUBIDEAU CREEK	15	NW	NW	SW	19	51	N	11	W	N	19Q	1.0000	C	S,C	12/31/1981	12/31/1980	05/01/1981	0	47968.00000		81CW0135	1		0	USE INCLUDES HYDRO ELECTRIC POWER
40	2184	6 R DITCH NO 1	1	5	ROUBIDEAU CREEK	15	NW	NW	SW	19	51	N	11	W	N	19Q	1.0000	C	S,C,AB	12/31/1981	12/31/1980	05/01/1981	0	47968.00000		85CW0285	2		0	REF 81CW135 ABANDONED BY COURT 1/22/1990
40	2185	6 R DITCH NO 2	1	5	ROUBIDEAU CREEK	15	NW	NW	NW	19	51	N	11	W	N	19Q	0.5000	C	S,C	12/31/1981	12/31/1980	05/01/1981	0	47968.00000		81CW0135	1		0	USE INCLUDES HYDRO ELECTRIC POWER
40	2185	6 R DITCH NO 2	1	5	ROUBIDEAU CREEK	15	NW	NW	NW	19	51	N	11	W	N	19Q	0.5000	C	S,C,AB	12/31/1981	12/31/1980	05/01/1981	0	47968.00000		85CW0285	2		0	REF 81CW135 ABANDONED BY COURT 1/22/1990

40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	18	0.0000	C	S,AP	12/31/1982	12/31/1981	08/31/1908	0	48212.21427		82CW0008	4	4100530	.05C DOM 1.25C TWO HGTS IN DIST 40 ALSO OTHER ALT PTS IN DIST 41
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	18	0.0000	C	S,AP,AB	12/31/1982	12/31/1981	08/31/1908	0	48212.21427		82CW0008	10	4100530	CANCELLED BY COURT 6/23/1986
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	1	0.0000	C	S,AP	12/31/1982	12/31/1981	07/31/1967	0	48212.42945		82CW0195	7	4100530	15.0C HAS 2 HGTS IN DIST 40 ALSO OTHER ALT PTS IN DIST 41
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	9	0.0000	C	S,AP	12/31/1982	12/31/1981	07/31/1967	0	48212.42945		82CW0195	8	4100530	1.00C HAS TWO HGTS IN DIST 40 ALSO OTHER ALT PTS IN DIST 41
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	1	0.0000	A	S,C,AP	12/31/1982	12/31/1981	01/19/1982	0	48231.00000		82CW0008	5	4100530	3.00C HAS TWO HGTS IN DIST 40 ALSO OTHER ALT PTS IN DIST 41
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	19	0.0000	A	S,C,AP	12/31/1982	12/31/1981	05/23/1982	0	48355.00000		82CW0134	6	4100530	3.75 HAS TWO HGTS IN DIST 40 ALSO OTHER ALT PTS IN DIST 41
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	19	0.0000	A	S,C,AB	12/31/1982	12/31/1981	05/23/1982	0	48355.00000		82CW0134	11	0	3.75 ABANDONED 10/30/1987 ALT PTS IN DIST. 41
40	1317	SPRUCE SPRING DITCH	1	5	ROUBIDEAU CREEK	43		SW	NE	16	47	N	12	W	N	19	0.0000	C	S,AP	12/31/1983	12/31/1982	07/31/1967	0	48577.42945		83CW0269	9	4100530	4.60C HAS 2 HGTS IN DIST 40 ALSO OTHER ALT PTS IN DIST 41
40	2401	R GRAY DITCH	1	5	ROUBIDEAU CREEK	15	SE	SW	SE	30	51	N	11	W	N	1	2.0000	C	S	12/31/1987	12/31/1986	07/01/1960	0	50038.40359		87CW0192	1	0	WASTE WATER FROM UNCOMPAHGRE PROJECT
40	2412	MARY JANE SPRING	4	5	ROUBIDEAU CREEK	43	NW	SE	NW	6	49	N	12	W	N	90	0.0040	C	S	12/31/1987	12/31/1986	08/12/1986	0	50038.49897		87CW0288	1	0	ACTUAL LOCATION SW NE NW SEC 6 49N 12W N
40	2461	LONG PARK D HGT NO 6	1	5	ROUBIDEAU CREEK	43	NE	NW	SW	4	49	N	13	W	N	1	0.5000	C	S,C	12/31/1989	12/31/1988	08/07/1989	0	50988.00000		89CW0212	1	0	
40	2461	LONG PARK D HGT NO 6	1	5	ROUBIDEAU CREEK	43	NE	NW	SW	4	49	N	13	W	N	1	0.5000	C	S,C,AB	12/31/1989	12/31/1988	08/07/1989	0	50988.00000		96CW0085	2	0	ABANDONED BY COURT 2-18-03
40	2462	LONG PARK D HGT NO 7	1	5	ROUBIDEAU CREEK	43	NE	SE	NW	4	49	N	13	W	N	1	1.2000	C	S,C	12/31/1989	12/31/1988	08/07/1989	0	50988.00000		89CW0213	1	0	
40	2462	LONG PARK D HGT NO 7	1	5	ROUBIDEAU CREEK	43	NE	SE	NW	4	49	N	13	W	N	1	1.2000	C	S,C,AB	12/31/1989	12/31/1988	08/07/1989	0	50988.00000		96CW0084	2	0	ABANDONED BY COURT 2-18-03
40	2582	BLACK CABIN SPRING	4	5	ROUBIDEAU CREEK	43	NE	SW	SE	17	47	N	12	W	N	89	0.0120	C	S	12/31/1992	12/31/1991	06/11/1951	0	51864.37051		92CW0106	1	0	
40	2570	MICALE ROUBIDEAU RNH D	1	5	ROUBIDEAU CREEK	15	NE	NW	NW	19	51	N	11	W	N	1	2.0000	C	S,C	12/31/1992	12/31/1991	03/23/1992	0	51947.00000		92CW0026	1	0	
40	2570	MICALE ROUBIDEAU RNH D	1	5	ROUBIDEAU CREEK	15	NE	NW	NW	19	51	N	11	W	N	1	2.0000	C	S,CA	12/31/1992	12/31/1991	03/23/1992	0	51947.00000		98CW0138	2	0	
40	2574	ROBERTS DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	32	51	N	11	W	N	19	1.2500	C	S,C	12/31/1992	12/31/1991	12/16/1992	0	52215.00000		92CW0162	1	0	.033CFS IS USED FOR STOCKWATER
40	2574	ROBERTS DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	32	51	N	11	W	N	19	0.5500	C	S,CA	12/31/1992	12/31/1991	12/16/1992	0	52215.00000		99CW0076	2	0	.70 CFS REMAINS COND.
40	2640	LEE BENCH SPRING	4	5	ROUBIDEAU CREEK	43	SE	SW	NW	36	50	N	13	W	N	9W	0.0010	C	S	12/31/1993	12/31/1992	06/29/1946	0	52230.35243		93CW0228	1	0	
40	2682	COBB'S WASTE WATER DITCH	1	5	ROUBIDEAU CREEK	15	SE	NE	NE	19	51	N	11	W	N	1	2.0000	C	S	12/31/1994	12/31/1993	03/23/1897	0	52595.17249		94CW0253	1	0	
40	2732	COBB'S DITCH	1	5	ROUBIDEAU CREEK	15	SE	NW	SW	20	51	N	11	W	N	1	2.0000	C	S	12/31/1994	12/31/1993	01/26/1955	0	52595.38376		94CW0154	1	0	
40	2680	CUNNINGHAM D NO 1,2,3,4	1	5	ROUBIDEAU CREEK	15	SW	NE	NW	29	15	S	96	W	S	1	2.0000	C	S	12/31/1994	12/31/1993	10/11/1972	0	52595.44844		94CW0225	1	0	2.0CFS TOTAL FROM ALL FOUR PTS
40	2654	TRANQUILITY DITCH	1	5	ROUBIDEAU CREEK	15	NW	NW	SW	28	15	S	96	W	S	19	1.0000	C	S	12/31/1994	12/31/1993	10/31/1972	0	52595.44864		94CW0054	1	0	
40	2721	C & M DITCH NO 1	1	5	ROUBIDEAU CREEK	43	SE	SE	NE	5	50	N	11	W	N	1	0.5000	C	S	12/31/1995	12/31/1994	04/30/1958	0	52960.39566		95CW0158	1	0	
40	2722	C & M DITCH NO 2	1	5	ROUBIDEAU CREEK	15	NW	NE	NE	5	50	N	11	W	N	1	0.5000	C	S	12/31/1995	12/31/1994	04/30/1958	0	52960.39568		95CW0158	1	0	
40	2726	CHAPMAN DITCH	1	5	ROUBIDEAU CREEK	15	SE	NE	NW	21	15	S	96	W	S	1	0.1250	C	S	12/31/1995	12/31/1994	04/30/1964	0	52960.41758		95CW0169	1	0	
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	3.0000	C	S	12/31/1995	12/31/1994	06/08/1995	0	53119.00000		95CW0078	7	0	SECOND ENLARGEMENT FOR 193 AC IN SEC 32 AND 33
40	2788	COTTON SPRING NO 1	4	5	ROUBIDEAU CREEK	43	NE	SE	NW	4	49	N	13	W	N	57*	0.0500	C	S	12/31/1996	12/31/1995	10/23/1936	0	53325.31707		96CW0295	1	0	SAME WATER AS FILED IN 89CW213
40	2789	COTTON SPRING NO 2	4	5	ROUBIDEAU CREEK	43	NE	NW	SW	4	49	N	13	W	N	57*	0.0500	C	S	12/31/1996	12/31/1995	10/23/1936	0	53325.31707		96CW0295	1	0	
40	2768	D'APONTI WASTEWATER D	1	5	ROUBIDEAU CREEK	15	NE	NE	SE	21	51	N	11	W	N	1	1.5000	C	S	12/31/1996	12/31/1995	12/31/1974	0	53325.45655		96CW0159	1	0	
40	2763	DORR SPRING NO 10	4	5	ROUBIDEAU CREEK	43	NE	NE	SW	30	49	N	13	W	N	9	0.0100	C	S	12/31/1996	12/31/1995	12/31/1991	0	53325.51864		96CW0149	1	0	
40	2761	DORR SPRING NO 8	4	5	ROUBIDEAU CREEK	43	SW	SW	SW	30	49	N	13	W	N	89	0.0200	C	S	12/31/1996	12/31/1995	12/31/1991	0	53325.51864		96CW0149	1	0	
40	2762	DORR SPRING NO 9	4	5	ROUBIDEAU CREEK	43	SW	SE	SW	30	49	N	13	W	N	9	0.0100	C	S	12/31/1996	12/31/1995	12/31/1991	0	53325.51864		96CW0149	1	0	
40	2758	WOZNICK WSTEWATER DITCH	1	5	ROUBIDEAU CREEK	15	NE	NE	SE	21	51	N	11	W	N	1	0.0200	C	S	12/31/1996	12/31/1995	06/01/1994	0	53325.52747		96CW0133	1	0	
40	2760	BRIAN DITCH	1	5	ROUBIDEAU CREEK	43	SW	SE	SW	29	51	N	11	W	N	19	0.2000	C	S	12/31/1996	12/31/1995	08/06/1996	0	53544.00000		96CW0146	1	0	
40	2962	PEG'S WASTEWATER DITCH	1	5	ROUBIDEAU CREEK	43	SE	NE	NW	21	51	N	11	W	N	19	1.0000	C	S,C	12/31/1996	12/31/1995	10/15/1996	0	53614.00000		96CW0227	1	0	IRRIGATES 30 ACRES
40	2962	PEG'S WASTEWATER DITCH	1	5	ROUBIDEAU CREEK	43	SE	NE	NW	21	51	N	11	W	N	19	0.3000	C	S,CA	12/31/1996	12/31/1995	10/15/1996	0	53614.00000		01CW0080	3	0	.70 CFS REMAINS CONDITIONAL
40	2826	GRAY DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	29	51	N	11	W	N	19	1.5000	C	S	12/31/1997	12/31/1996	06/30/1960	0	53691.40358		97CW0109	1	0	.05 CFS USED FOR STOCK WATER
40	2817	LEIS WASTE WATER DITCH	8	5	ROUBIDEAU CREEK	43	SE	SE	SW	21	51	N	11	W	N	1	0.0500	C	S	12/31/1997	12/31/1996	05/17/1994	0	53691.52732		97CW0083	1	0	
40	2826	GRAY DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	29	51	N	11	W	N	1	0.5000	C	S,C	12/31/1997	12/31/1996	07/29/1997	0	53901.00000		97CW0109	2	0	
40	2826	GRAY DITCH	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	29	51	N	11	W	N	1	0.5000	C	S,CA	12/31/1997	12/31/1996	07/29/1997	0	53901.00000		04CW0032	3	0	
40	1436	HALLEY DITCH	1	5	ROUBIDEAU CREEK	15	NW	SE	SW	17	51	N	11	W	N	1	6.0000	C	S	12/31/1999	12/31/1998	05/01/1937	0	54421.31897		99CW0049	5	0	AKA HALLEY DITCH ENLARGEMENT
40	3821	CLAY POND	3	5	ROUBIDEAU CREEK	15	NW	SW	SW	22	50	N	13	W	N	W	0.1000	A	S	12/31/2000	12/31/1999	08/14/2000	0	55013.00000		00CW0246	1	0	
40	2996	CLAY SPRING	4	5	ROUBIDEAU CREEK	15	NW	SW	SW	22	50	N	13	W	N	9W	0.0330	C	S	12/31/2000	12/31/1999	08/14/2000	0	55013.00000		00CW0246	1	0	
40	6055	FRASER SPRING	4	5	ROUBIDEAU CREEK	43	NE	SW	SW	20	51	N	11	W	N	1	0.0250	C	S,C	12/31/2002	12/31/2001	07/23/2002	0	55721.00000		02CW0119	1	0	
40	6053	FRASER WASTEWATER DITCH NO 1	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	20	51	N	11	W	N	1	0.0250	C	S,C	12/31/2002	12/31/2001	07/23/2002	0	55721.00000		02CW0119	1	0	
40	6054	FRASER WASTEWATER DITCH NO 2	1	5	ROUBIDEAU CREEK	43	NW	SW	SW	20	51	N	11	W	N	1	0.0250	C	S,C	12/31/2002	12/31/2001	07/23/2002	0	55721.00000		02CW0119	1	0	
40	2962	PEG'S WASTEWATER DITCH	1	5	ROUBIDEAU CREEK	43	SE	NE	NW	21	51	N	11	W	N	19	0.1510	C	S	12/31/2003	12/31/2002	10/15/1996	0	55882.53614		03CW0098	2	0	PEG'S W/W DITCH ENLARGEMENT
40	1425	ADOBE DITCH	1	5	ROUBIDEAU CREEK	15	NE	SE	SW	21	51	N	11	W	N	1	0.0700	C	S	12/31/2003	12/31/2002	08/05/2001	0	55882.55369		03CW0200	8	0	HDGT LOCATION SE NE SW SEC 21 SEE STIP
40	6088	GRAHAM WASTEWATER DITCH NO 1	1	5	ROUBIDEAU CREEK	15	SW	NW	NE	30	51	N	11	W	N	19	0.7500	C	S	12/31/2003	12/31/2002	04/12/2002	0	55882.55619		03CW0101	1	0	
40	6088	GRAHAM WASTEWATER DITCH NO 1	1	5	ROUBIDEAU CREEK	15	SW	NW	NE	30	51	N	11	W	N	1	1.2500	C	S,C	12/31/2003	12/31/2002	04/12/2002	0	55882.55619		03CW0101	2	0	
40	6149	BUTTERMILK CREEK PUMP	8	5	ROUBIDEAU CREEK	15	SW	SW	NW	21	51	N	11	W	N	19	0.5000	C	S,C	12/31/2003	12/31/2002	12/22/2003	0	56238.00000		03CW0269	1	0	
40	6146	CANTY SPRINGS	4	5	ROUBIDEAU CREEK	43	NW	NW	NE	26	50	N	13	W	N	189	0.0500	C	S	12/31/2004	12/31/2003	06/01/1913	0	56247.23162		04CW0018	1	0	