

ARKANSAS VALLEY DITCH ASSOCIATION

c/o Delores Putnam
59 MacGregor Rd.
Pueblo, Colorado 81001

July 26, 1985

To: Arkansas Valley Ditch Association
Executive Board and Canal Companies

Gentlemen:

Enclosed is a status report and related material from Mr. Rexford L. Mitchell, A.V.D.A. attorney, regarding Case No.'s 83 CW 124 through 83 CW 131 Wyoming Fuel Application, 84 CW 179 Winter Storage Application, and 83 CW 18 R.I.G. Application to transfer the Rocky Ford Ditch Water.

Mr. Mitchell, Mr. Frank Milenski and Mr. Lee Hancock in conjunction with Wright Water Engineers have negotiated with representatives of Wyoming Fuel in behalf of Arkansas Valley Ditch Association. If you have certain concerns and wish to discuss this case further, please let me know and we will schedule a meeting for this purpose. If not and the final decree is satisfactory to Mr. Mitchell, we will assume his action to be representative of Arkansas Valley Ditch Association in these cases.

Also enclosed is a copy of an amendment submitted by Kansas to the Arkansas River Compact Administrations relating to the resolution concerning alleged violations of the Compact which was adopted March 28, 1985.

The amendment appears to be an effort by Kansas to force Colorado to consider the effect of Colorado administration (or non-administration) of wells upon state line delivery.

The amendment was approved by both states during the special compact meeting held July 12, 1985. It was the Colorado opinion that the resolution adopted on March 28th incorporated an investigation of Colorado and Kansas wells as it relates to state line depletion, therefore did not increase the scope of this particular investigation.

Sincerely,

Carl G. Genova
sp

Carl G. Genova
Secretary-Treasurer

CGG:dp

Enclosures



Wright Water Engineers, Inc.

2490 West 26th Ave., Suite 55 A
 Denver, Colorado 80211
 (303) 480-1700

June 28, 1985

Southeastern Colorado Water
 Conservancy District
 c/o Kevin B. Pratt
 Fairfield and Woods, Attorneys-at-Law
 1600 Colorado National Building
 950 Seventeenth Street
 Denver, CO 80202

Arkansas Valley Ditch Association
 c/o Rexford L. Mitchell
 Mitchell-Mitchell, P.C., Attorneys-at-Law
 512 North Main Street
 Rocky Ford, CO 81067

S T A T E M E N T

Engineering services for May 1985 regarding the following:

Rocky Ford Ditch Case No. 83CW018--engineering analyses; meetings with Wheeler & Associates, Patterson & Associates, and attorneys; letter and memoranda as related to determinations of negative river loss logic and District position and land irrigated and crops grown on RIG lands.

Sr. Principal Engineer	2 1/4 hrs. @ 75.00	\$ 168.75
Sr. Water Engineer I	16 3/4 hrs. @ 59.00	988.25
Water Engineer II	79 1/2 hrs. @ 44.00	3,498.00
Engineering Technician	5 1/2 hrs. @ 26.00	143.00
Technician	9 1/4 hrs. @ 23.00	212.75
Auto		135.75
Travel		13.23
Parking		1.00
Printing		16.52
Telephone		38.33
Postage & Freight		.39
Computer/Data Processing - inside service		85.05
Word Processor		30.00
Supplies		55.00
Administrative Fee of 5%		18.76
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Subtotal		\$5,404.78

Wyoming Fuels Case Nos. 83CW124 through 83CW131--work included meetings with the applicant's engineer to review diversion records and aerial photos, a field inspection of the applicant's land and irrigation ditches, and a preliminary letter report dated May 28, 1985.

Sr. Principal Engineer	2 1/2 hrs. @ 75.00	\$ 187.50
Sr. Project Engineer	18 1/2 hrs. @ 61.00	1,128.50
Water Engineer II	22 hrs. @ 44.00	968.00
Engineering Technician	2 hrs. @ 26.00	52.00
Technician	2 1/2 hrs. @ 23.00	57.50
Auto		126.75
Lodging & Subsistence		6.85
Printing		65.46
Telephone		35.66
Word Processor		25.00
Supplies		171.00
Administrative Fee of 5%		21.54
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	Subtotal	\$ 2,845.76

Colorado Canal Protest Case Nos. 84CW62 through 84CW64--In connection with an on-going review of the change of water right application for the Colorado Canal, including a review of decrees for the Colorado Canal, Lake Henry and Lake Meredith, review of USGS groundwater mapping, and meetings with counsel for SECWCD and with the Board of AVDA.

Sr. Principal Engineer	3/4 hr. @ 75.00	\$ 56.25
Water Engineer II	8 1/2 hrs. @ 44.00	374.00
Engineering Technician	1/2 hr. @ 26.00	13.00
Technician	1 1/4 hrs. @ 23.00	28.75
Computer/Data Processing - inside service		60.50
Word Processor		7.50
Administrative Fee of 5%		3.40
		<hr/>
	Subtotal	\$ 543.40

AMOUNT DUE THIS STATEMENT \$ 8,793.94

Amount Due This Statement from
 Southeastern Colorado Water
 Conservancy District \$ 4,396.97

Amount Due this Statement from
 Arkansas Valley Ditch
 Association \$ 4,396.97

Pd. 2500.00 CB8
 WRIGHT WATER ENGINEERS, INC.

By 
 Kenneth R. Wright



Wright Water Engineers, Inc.

DENVER OFFICE
2490 West 26th Ave., Suite 55A
Denver, Colorado 80211
(303) 480-1700

TULSA OFFICE
707 South Houston, Suite 302
Tulsa, Oklahoma 74127
(918) 584-7136

GLENWOOD SPRINGS OFFICE
818 Colorado Avenue
P.O. Box 219
Glenwood, Springs, Colorado 81602
(303) 945-7755
Denver Direct Line: 893-1608

May 28, 1985

Mr. Howard Holme
Fairfield and Woods
1600 Colorado National Building
950 Seventeenth Street
Denver, Colorado 80202

Mr. Rexford L. Mitchell
Mitchell & Mitchell, P.C.
512 North Main Street
Rocky Ford, Colorado 81067

Re: North Central Energy - Wyoming Fuel Company Applications,
Case Nos. 83 CW124 through 83 CW131

Gentlemen:

Pursuant to Howard Holme's letter of April 29, 1985, we have analyzed the issues of missing diversion records, actual irrigated acreage, and consumptive use ceilings in the above-referenced case. On May 15, 1985, we joined with the Division Engineer, Water Commissioner, and representatives of the Southeastern Colorado Water Conservancy District, Purgatoire Water Conservancy District, and Arkansas Valley Ditch Association in a field trip to inspect the principal ditches and irrigated lands. A trip report with photographs will be forwarded to you under separate cover.

Diversion Records

With respect to the diversion records, two issues were examined--the treatment of missing entries and the reconstruction of diversion quantities. In many of the years under study the Water Commissioner's records indicate only whether a headgate was open or closed; for such years Patterson has assumed that the full decreed amount was diverted whenever the headgate was open. The data in the "Division Summary" tables in Patterson's report were derived by this method for roughly half of the years between 1950 and 1970. The Water Commissioner and Harold Winter indicated during the field trip that this appears to be a reasonable assumption. However, we believe that the Patterson assumption must be challenged because it may be an overstatement. For instance, the principal waterline on the Consolidated Ditch flume indicates a normal flow of 17 cfs with some diversions of close to 30 cfs. Also, Patterson apparently did not relate diversions to physical water availability in the streams.

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For several of the rights in the package many years of record were excluded by Patterson in calculating the average annual diversions. A review of the Water Commissioner's records indicated that most of those missing years were, in fact, years of no diversion. In a few cases there were no records at all. We have added those omitted years for which the records show that no diversion occurred to the periods of record for the respective ditches and have recomputed the average monthly diversions. The net reduction in the total average annual amounts of water diverted thus obtained is about 109 acre-feet. Using Patterson's assumptions regarding irrigation efficiency for estimating consumptive use, this would correspond to a reduction in transferable yield of about 63 acre-feet. It should be noted that this issue of disregarding years of non-use applies mainly to the smaller water rights in the case.

We believe that the matter of ditch diversions needs particular attention for further detailed study.

Irrigated Area

With respect to irrigated acreages, our analysis consisted of a review of Patterson's aerial photos, the aforementioned field trip, and conversations with Ivan Walters, of W. W. Wheeler and Associates, who is representing Trinidad. A search has also been conducted for additional aerial photography; and two sets of photos for the years 1970 and 1984 have been ordered, which we believe will provide better indications of irrigation practices. We expect to receive these aerial photographs in about three weeks.

Based on our analysis of currently available data, we believe that Patterson has overestimated the irrigated acreage by roughly 500 acres. This number will probably be refined upward using the new aerial photography. The main reduction in acreage is on the South Branch of the Consolidated Ditch, i.e., that part of the ditch serving lands known as the "Quatro Meadow" along the south side of the South Fork of the Purgatoire River. Smaller acreage reductions are indicated in the South Valley area.

These reduced acreages have been used to re-estimate irrigation requirements with the modified Blaney-Criddle procedure used by Patterson based on average monthly climatic data and diversions. However, based on Patterson's assumption of 50 percent overall efficiency, these lands still appear to be water-short so that the reduced acreage would not result in a reduction in calculated historic consumptive use.

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Irrigation Efficiency

Patterson and Associates analyzed the irrigation operations under the Wyoming Fuel Company's water rights as being a "water short" system, meaning one where potential consumptive use exceeds the irrigation water supply. Under these conditions, historical consumptive use may be calculated as a function of the historical water supply.

It is usual to base such calculations upon the measured headgate diversions multiplied by a "canal efficiency" factor, reflecting seepage losses between the river headgate and the farm lateral headgate, and then by a "field efficiency" factor, reflecting losses by surface runoff and deep percolation. The Patterson report calculated consumptive use by applying a single overall "irrigation efficiency" factor to the river headgate diversions for each water right. The irrigation efficiency factors assumed by Patterson were 80 percent for the South Valley area under the Consolidated Ditch, 50 percent for the Quantro Meadow area under the Consolidated Ditch, 50 percent for the Ramon Torres Ditch, and 60 percent for each of the other ditches.

It is our opinion that the 80 percent overall efficiency assumed for the South Valley area under the Consolidated Ditch is too high and cannot be supported on the basis of data cited in the Patterson report. Ditch seepage losses would be significant from the upper segment of the ditch whence the return flows would be to the South Fork of the Purgatoire River. For approximately 6,000 feet below the headgate, the ditch traverses a steep hillside cut through soils which are variably stoney and shaley and do not appear to be very tight. For another 3,000 feet, the ditch traverses less steep terrain through soils which appear to be highly permeable, before it crosses a topographic divide into the South Valley watershed, which drains northward to the Middle Fork of the Purgatoire River. At the time of the field inspection water had not yet been diverted through the Consolidated Ditch, so that evidence of concurrent seepage was not available. Although vegetation immediately below the ditch embankment did not show apparent evidence of seepage from the canal, the Water Commissioner commented that the bottom land below the break in slope below the ditch becomes boggy each year when the ditch begins to carry water and dries up again within about two weeks after the ditch ceases to carry water. In the absence of actual data from seepage loss studies, we would suggest that a 10 percent canal loss should be assumed for the North Branch of the Consolidated Ditch.

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With respect to field efficiencies in the South Valley area, the Patterson report stated, "Efficiency for the Consolidated Ditch was estimated to be 80 percent in the South Valley area because of the interconnection of ditches and laterals indicating re-use of water." The topography of the South Meadow area is unusual in that irrigation water diverted into the upper end of the valley would have to travel on the surface or through the subsurface a distance of about five miles before returning to the Middle Fork of the Purgatoire River near Stonewall. There are also numerous laterals for managing surface runoff to maximize its beneficial use. Accordingly, it is reasonable to expect that the field efficiency for the South Valley would be somewhat higher than the normal range of 30 to 40 percent for flood irrigation of mountain pasture. The controlling factors would be the extent to which irrigation water could be kept on the surface and the subsurface factors affecting the movement of groundwater. A review of preliminary soil mapping of the area by the Soil Conservation Service indicates that the soils in the South Valley are classified as clayey valley and clay-loam deposits. These relatively tight soil types could indicate the potential for somewhat higher field irrigation efficiencies, where there was opportunity to redirect surface runoff. Field observations and comments by people with knowledge of the area, however, indicated that infiltration rates for soils in the South Valley area would be normal to high. In the absence of infiltration test data and a more detailed analysis of groundwater movement within the South Valley, we would recommend that field efficiencies be assumed to be in the 60 to 70 percent range for the South Valley area.

Combining our assumed canal loss of 10 percent and field efficiency of 60 to 70 percent would give a range of 54 to 63 percent for the overall "irrigation efficiency" within the South Valley area, as opposed to the 80 percent given in the Patterson report.

Summary

To summarize, we believe that: 1) average historic diversions, especially in the smaller ditches, are somewhat less than indicated by Patterson; 2) irrigated acreages under the Consolidated Ditch are less than indicated by Patterson; and 3) efficiencies, particularly under the Consolidated Ditch, are lower than estimated by Patterson. In general, however, the consumptive use of water under the ditches in question still appears to be limited by water availability rather than by irrigated acreage and potential consumptive use.

We propose to refine our estimates and analyses based on the aerial photography which should be available by about June 12 and also taking into account

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undecreed and unmeasured tributary runoff from the forested areas above the Consolidated Ditch. At that time we will finalize our calculation of the acceptable consumptive use for each ditch, which we would recommend as a basis for settlement negotiations. We should be able to report to you on the results of this work by about June 25.

We would appreciate your comments regarding the scope of work outlined above and any suggestions you might have concerning other factors or avenues of investigation that should be included. Please call us if you should have any questions.

Very truly yours,

WRIGHT WATER ENGINEERS, INC.

By *CMBrendecke*
Charles Brendecke, Ph.D., P.E.

By *Charles R. Haines*
Charles R. Haines

CMB/CRH:djg
741-017.560
cc: Kevin Pratt

DISTRICT COURT, WATER DIVISION NO. 2, COLORADO

CASE NO. 83CW18

JUL 9 1985

MINUTE ORDER

Roselee A. Lyons

Clerk

IN THE MATTER OF THE APPLICATION FOR CHANGE OF WATER
RIGHTS OF:

RESOURCE INVESTMENT GROUP, LTD, MONTINI CATTLE COMPANY,
VALCO, INC., FRANK L. and PATRICIA GILBERT, ROY E. and
ALICE MOFFETT, JOHN K. and MILDRED GAUSE, JOHN K. and
DONALD GAUSE, and IRENE GAUSE,

IN OTERO AND PUEBLO COUNTIES, COLORADO
IN THE ARKANSAS RIVER, OR ITS TRIBUTARIES
IN OTERO and PUEBLO COUNTIES.

This matter came on for hearing on the following motions:
Motion to Vacate Trial Date and Reschedule filed on behalf
of Arkansas Valley Ditch Association, et al; Motion For
In Limine Ruling filed on behalf of Fort Lyon Canal Company;
Motion to Vacate Trial filed on behalf of Fort Lyon Canal
Company; Motion to Compel Discovery filed on behalf of the
Fort Lyon Canal Company; Motion To Vacate Trial filed on
behalf of Public Service Company of Colorado and Las Animas
Consolidated Canal Company; Applicants' Motion For Protective
Order and For In Camera Inspection and Applicants' Motion
To Compel Discovery.

Present: William A. Hillhouse II, Esq. on behalf of
Applicants; John Dingess, Esq. on behalf of the City of
Aurora; Wayne B. Schroeder, Esq. on behalf of Fort Lyon
Canal Company; Rexford L. Mitchell on behalf of Arkansas
Valley Ditch Association et al; Timothy J. Flanagan, Esq.
on behalf of Public Service Company of Colorado and Las
Animas Consolidated Canal Company; Ralph N. Wadleigh, Esq.
on behalf of the Holbrook Mutual Irrigating Company;
Kevin B. Pratt, Esq. on behalf of Southeastern Colorado
Water Conservancy District; John Wittemyer, Esq. on behalf
of The Colorado Canal Company, et al and Robert F. T. Krassa,
Esq. on behalf of Harry E. Aschermann Estate, et al.