Transfers of Water Use in Colorado

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TRANSFERS OF WATER USE IN COLORADO

Chapter 3 from Volume 2 of
The Water Transfer Process as a
Management Option for
Meeting Changing Water Demands

Lawrence J. MacDonnell
Charles W. Howe
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University of Colorado

Natural Resources Law Center
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1990
CHAPTER 3

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Lawrence J. MacDonnell
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University of Colorado
# CHAPTER 3

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables and Figures</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td><strong>Section 1: Legal/Institutional Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Water Rights in Colorado</td>
<td>1</td>
</tr>
<tr>
<td>Changes in Water Rights</td>
<td>2</td>
</tr>
<tr>
<td>The Legal Basis</td>
<td>2</td>
</tr>
<tr>
<td>What May Be Changed or Transferred</td>
<td>3</td>
</tr>
<tr>
<td>The Change Procedure</td>
<td>4</td>
</tr>
<tr>
<td>The &quot;No Injury&quot; Rule in Colorado</td>
<td>4</td>
</tr>
<tr>
<td>Terms and conditions</td>
<td>5</td>
</tr>
<tr>
<td>Burden of proof</td>
<td>5</td>
</tr>
<tr>
<td>Exchanges and Substituted Supplies</td>
<td>5</td>
</tr>
<tr>
<td>Plans for Augmentation</td>
<td>6</td>
</tr>
<tr>
<td>Temporary Changes of Water Rights</td>
<td>7</td>
</tr>
<tr>
<td>Transferability of Special Categories of Water</td>
<td>7</td>
</tr>
<tr>
<td>Transfers of Designated Groundwater</td>
<td>7</td>
</tr>
<tr>
<td>Transfer of Nontributary Groundwater</td>
<td>8</td>
</tr>
<tr>
<td>Imported or Foreign Water</td>
<td>8</td>
</tr>
<tr>
<td>Transfers of Salvaged Water</td>
<td>8</td>
</tr>
<tr>
<td>Transfer of a Conditional Water Right</td>
<td>9</td>
</tr>
<tr>
<td>Transfers of Contract Water</td>
<td>9</td>
</tr>
<tr>
<td>Interstate Transfers</td>
<td>10</td>
</tr>
<tr>
<td>Transfers of Tribal Water</td>
<td>10</td>
</tr>
<tr>
<td>Transfers and Water Supply Organizations</td>
<td>10</td>
</tr>
<tr>
<td>Mutual Ditch/Mutual Reservoir Companies</td>
<td>10</td>
</tr>
<tr>
<td>Irrigation Districts</td>
<td>11</td>
</tr>
<tr>
<td>Water Users Associations</td>
<td>11</td>
</tr>
<tr>
<td>Conservancy Districts</td>
<td>11</td>
</tr>
<tr>
<td>Municipalities</td>
<td>11</td>
</tr>
<tr>
<td><strong>Section 2: Changes of Water Use, 1975-1984</strong></td>
<td>12</td>
</tr>
<tr>
<td>Change Activity</td>
<td>12</td>
</tr>
<tr>
<td>Characteristics of the Changes</td>
<td>12</td>
</tr>
<tr>
<td>The Change Process</td>
<td>13</td>
</tr>
<tr>
<td><strong>Section 3: Transaction Cost in Colorado: A Case Study</strong></td>
<td>13</td>
</tr>
<tr>
<td>Conclusions</td>
<td>16</td>
</tr>
<tr>
<td><strong>Section 4: Case Studies</strong></td>
<td>17</td>
</tr>
<tr>
<td>Analysis of Randomly Selected Cases</td>
<td>17</td>
</tr>
</tbody>
</table>
Clear Creek, Colorado .................................................. 20
  Physical Facilities ................................................. 21
  Hydrology of the Basin ........................................... 21
  Historical Shift in Basin Water Use .............................. 21
  Current Transfer Impediments .................................... 22
South Park, Colorado .................................................. 22
Lower Arkansas Valley, Colorado ..................................... 25
  Hydrology .......................................................... 26
  Diversion and Storage Systems .................................... 26
  Historical Water Use .............................................. 27
  Historical Transfer Activity ...................................... 28
  Rocky Ford Transfers ............................................. 28
  Colorado Canal Transfers ........................................ 29
  Local Impacts From Water Transfer Activity ................. 30

Section 5: Summary of Findings and Conclusions .................. 30
  Findings and Conclusions ........................................ 31
TABLES AND FIGURES

Tables

2.1 Applications for Change of Water Use, 1974-1984
3.1 Data from 9 Colorado Case Studies
3.2 Estimated ATRC Values from Equation (1a)
4.1 Type of Change for Sample Transfer Cases
4.2 Characteristics of Sample Transfer Cases
4.3 Lower Clear Creek Ditch Company Stock Ownership, 1989
4.4 Stock Distribution for Farmer's Highline Canal and Reservoir Company, 1974 and 1989
4.5 Ownership of Church Ditch Water, 1979 and 1989
4.6 South Park Water Rights Transfers, 1932-1988
4.7 Estimated Annual Water Supply - Pueblo, Colorado to Colorado-Kansas State Line
4.8 Major Lower Arkansas Valley Water Transfers, 1950-1986

Figures

1.1 Colorado Water Divisions
2.1 Number of Applications by Division as a Percentage of Total
2.2 Number of Applications by Division as a Function of Status, 1975-1984
2.3 Number of Applications Filed by Year
2.4 Number of Applications by Year For Divisions 1,2 and 3
2.5 Number of Applications by Year For Divisions 4,5,6 and 7
2.6 Proposed Shift in Nature of Water Use as a Percent of All Applications
2.7 Changes Involving Augmentation as a Function of Total Applications by Division
2.8 Percent of Transfers Associated with Various Quantities of Water Transferred in Cubic Feet Per Second
2.9 Percent of Transfers Associated with Various Quantities of Water Transferred in Acre-Feet
2.10 Source of Water Involved as a Percent of All Proposed Changes
2.11 Changes Involving Statements of Opposition as a Function of Total Applications by Division
2.12 Average Time to Decision as a Function of Final Ruling
2.13 Percent of Total Applications by Length of Time to Decision
2.14 Percent of Approved Cases Opposed as a Function of Months to Decision
4.1 Basin Map, Clear Creek basin
4.2 Physical Facilities in Clear Creek basin
4.3 Map of South Park, in Park County, Colorado
4.4 Arkansas River basin, Colorado
4.5 Diagrammatic sketch of irrigation-ditch systems along the lower Arkansas River, from Pueblo Reservoir to John Martin Reservoir
4.6 Diagrammatic sketch of irrigation-ditch systems along the lower Arkansas River, from John Martin Reservoir to the Kansas state line
5.1 Approval Status of Transfers
5.2 Mean Months to Decision by Final Ruling
5.3 Percent of All Cases Opposed (or Protested)
5.4 Number of Applications by Division as a Percentage of Total
5.5 Number of Applications by Division as a Function of Status
5.6 Changes Involving Statements of Opposition as a Function of Total Applications by Division
5.7 Average Time to Final Decision by Division
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LJM
Introduction

Colorado water policy traditionally has emphasized flexibility in the use of the state's water resources. It promotes this objective in several ways. First, Colorado law regards water rights as vested property rights which may be freely transferred in the same manner as other property rights. Second, it limits the basis for legal review of changes of water rights. Third, it treats water resources as largely interchangeable and promotes their optimal utilization. As a consequence of this policy, transfers of water rights, changes of rights, exchanges, and substituted supplies are all common practices in Colorado.

This chapter presents the results of an examination of Colorado law and experience in the transfer of the use of water. The first section provides a summary of Colorado law applying to water transfers. The second section reports the results of an empirical examination of all change-of-appropriative water-right activity involving a change in the use of water between 1975 and 1984. Section three presents a number of case studies including an analysis of a random selection of change cases filed between 1975 and 1984 as well as more general studies of transfer of water right activity in lower Clear Creek basin, in the South Park area, and in the lower Arkansas basin. The fourth section includes the results of our analysis of transactions costs for nine randomly selected change-of-water-right cases. The final section attempts a preliminary analysis of several important issues that emerge from this research. These include questions about the effectiveness of the transfer review process and the adequacy of review considerations.

Section 1: Legal/Institutional Analysis

Water rights in Colorado are of two basic types—those based on appropriation of water and those based on land ownership. Simple changes in ownership of water rights may occur without restriction. Transfers involving changes in other attributes of the water right such as purpose of use, however, are subject to legal review.

This section begins with a brief introduction to water rights law in Colorado. Then it turns to the law respecting changes of water rights. It describes other legal mechanisms available in Colorado for changing water use including exchanges, substituted supplies, and plans for augmentation. Next the section addresses the transferability of a number of legally distinctive categories of water. Finally it discusses the transferability of water uses controlled by several types of water supply organizations.

Water Rights in Colorado

In its 1876 Constitution, Colorado formally adopted the prior appropriation doctrine as the method for allocating rights to the use of the water "of every natural stream." Uniquely among the western states, Colorado retains much of the original notion of the appropriation doctrine that decisions about allocation and use of the resource are made by actions of individual appropriators, with the role of the state primarily limited to sorting out priorities. A specially constituted water court "determines" that a physical appropriation of water has occurred and that the water has been applied to a beneficial use. It also determines the priority date of the appropriation in a proceeding that essentially amounts to an ongoing general adjudication. The exercise of these water rights is closely administered by the state engineer's office through the seven division engineers and the water commissioners responsible for the state's streams. A map of Colorado showing the seven water divisions is shown in Figure 1.1.
Colorado law provides for "conditional" water rights allowing a would-be appropriator to establish a priority date as of the time the intent to appropriate is formed and certain acts manifesting that intent are taken. Until the conditional decrees are made absolute by demonstration of actual beneficial use of water, "reasonable diligence" in proceeding toward beneficial use must be shown in a water court proceeding every four years.

There are at least three legally distinctive categories of groundwater in Colorado. "Tributary" groundwater is considered so closely related to surface flows that rights to its use are determined and administered in a manner similar to that for surface water rights. An entirely separate system has been established for "designated" groundwater. Groundwater within designated basins is governed by a modified appropriation system. Finally, in 1985 the Colorado legislature clarified the rules applying to "nontributary" groundwater. Rights to nontributary groundwater are based on ownership of the overlying land rather than appropriation. The right extends to a proportionate share of the nontributary groundwater determined to underlie the land area.

All water rights in Colorado are "tabulated" every four years by the division engineers. The tabulations are lists of water rights which take water from the same source and may affect each other, according to their priority and the decreed amount of their water right. In addition, every ten years the division engineers are charged with preparing an abandonment list showing all absolute rights determined to have been abandoned in whole or in part. By statute there is a rebuttable presumption of abandonment if water rights have not been used for ten or more years.

Changes in Water Rights

The Legal Basis

Not long after recognizing the necessity of allocating water on the basis of appropriation in Colorado, the courts were faced with whether changes could be made in such rights without loss of priority. In an 1884 Colorado case, the supreme court ruled that a change in the point of diversion does not affect the water right or the priority. In 1888, the Colorado court addressed whether there could be a change in the point of diversion that also involved a change in the place of use. The court ruled that "in the absence of injurious consequences to others, any change which the party chooses to make is legal and proper."

Then, in 1891, the supreme court considered whether a water right used for irrigation purposes could be purchased by a city for domestic use without also purchasing the land on which the water had been used. The court noted that it had already permitted an existing water right to be transferred for use on different land. Thus, since the city could buy the land and its associated water right and then transfer the water right, the court ruled that the city need not buy the land if it only needs the water.

In the court's view, this result followed directly from the fact that a water right is a property right--specifically the priority right to the use of water. According to the court, "[i]f the priority to the use of water for agricultural purposes is a right of property, then the right to sell it is as essential and sacred as the right to possess and use." Thus, the right to transfer a water use priority was squarely established in Colorado, subject only to the "no injury" standard. In 1899, the Colorado legislature formalized this standard in enacting a change-in-point-of-diversion statute.
COLORADO WATER DIVISIONS
INCLUDING THE DESIGNATED GROUND WATER BASINS
What May Be Changed or Transferred

An appropriative water right includes a number of elements, most of which may be changed in Colorado. Generally, there is a specific point of diversion. There is a specified rate of diversion in the case of direct flow rights and a specific quantity of water in the case of storage rights. Water rights have an implied or expressed time of use. They have an implied or expressed place of use and they exist for specified types of use. By statute, change may be made in the point of diversion, in the type, place, or time of use, or between direct flow and storage rights. The only limitation on such changes is that they must not "injuriously affect the owner of or persons entitled to use water under a vested water right or a decreed conditional water right."

Much of the controversy in change of water right cases arises out of uncertainty in the scope of the original water right. Particularly in the earlier decrees, the elements of the water right often were not clearly specified. Moreover, the practice of describing direct flow water rights in terms of flow rates without any volumetric limitation in itself causes problems in determining the transferable quantity of water. Many decrees do not specify any time of use, though it may be implied to some degree by the type of use. Thus, for example, an irrigation water right is limited to the usual irrigation season in the area of use whereas domestic water use will be year-round. Water rights often are decreed for more than one type of use so the actual use of water under the right may not be apparent from the decree itself.

To provide definition to a water right the courts often have focused on "historic" use of the right. This very practical approach looks behind the decreed right to see what the historical pattern of use has been. Thus, it is not the right described in the court decree that necessarily defines the original right but, rather, the historical practice of appropriation and beneficial use of the water.

One of the attributes of a water right that often varies between the original decree and historical pattern is the quantity of water that is used. Many early decrees provided rates of diversion well in excess of the water actually used. The sale and transfer of these excess rights gave the purchaser a priority right to water that had never been used. Although initially refusing to consider whether an original decree authorized excess rights, subsequently the supreme court acknowledged that if the change resulted in an enlarged use of water, injury could result to other water users; thus it allowed consideration of abandonment in a change-of-water-right proceeding.

In a 1962 decision, the Colorado Supreme Court clarified the status of a water right with a decreed rate of diversion in excess of that actually used. The court noted that, irrespective of the decreed diversion right, a water right exists only to the extent of actual beneficial use. The remainder of the decreed right had not been abandoned; it had simply never been legally perfected.

Colorado courts have further defined a water right so that "diversions are limited to an amount sufficient for the purpose for which the appropriation was made, even though such limitation may be less than the decreed rate of diversion." In considering the transferable quantity of water, courts have looked to the "duty of water" in the original use. Duty of water is defined as "that measure of water, which, by careful management and use, without wastage, is reasonably required to be applied to any given tract of land for such period of time as may be adequate to produce therefrom a maximum amount of such crops as ordinarily are grown thereon." The historical use of water could be less than the optimum rate of use implied by the duty of water.
Thus, for purposes of making a change, a water right is defined not by its decree but by its historical use. The purchaser of a water right is entitled to use that water right in the same manner and with the same priority as the original user did. If the purchaser desires to change any of the elements of the right such as the point of diversion or the type, time, or place of use he will have to go through a formal change of water right proceeding.

The Change Procedure

Colorado law now provides a very expansive definition of change of water right.12 Applications to make changes of a water right are filed with the clerk of the water court.23

Any party may file a statement of opposition34 within two months following the month in which the application is filed.25 Change applications and statements of opposition are reviewed by the water referee who must rule on the application within 60 days.26 Within twenty days following the mailing of an order of the referee any party may file pleadings with the water judge. Such pleadings initiate an entirely new proceeding in which the court is not bound by findings of the referee.27

The applicant carries the burden of sustaining the application, including showing the absence of any injurious effect.28 If the applicant demonstrates an absence of injury, the referee or judge must approve the change.29 If it is determined that injury would result, terms and conditions preventing such injury may be proposed including (1) a limitation on the use of the water involved, (2) a relinquishment of part of the decree or another decree to prevent enlargement of use or diminution in return flows, and (3) a time limitation on the diversion of water.30

The "No Injury" Rule in Colorado

The issue of injury is, without question, the most commonly disputed aspect in changing a water right. At this point, the law-based elements of the no injury rule are reasonably well-defined. Factual disagreements are the primary reasons for disputes in these cases.

Courts often translate the no injury standard as protecting appropriators in the continuance of conditions of flow relied on to make their initial appropriations. The underlying assumption is that if stream conditions are not adversely affected by the change then there will be no impairment to other appropriators. Two important possible sources of injury are an increase in depletion of the stream or a change in the timing of flows.

The link established between the no injury rule and maintenance of stream conditions is the requirement that any water transferred be limited in quantity and time by the historical use under the original right. Stream conditions relied on by other appropriators must not be adversely affected by the change. Yet, because of the interdependency of users on a highly appropriated stream, any change in the point of diversion or the place, time or type of use is likely to alter stream conditions.

Beginning in 1954, the Colorado courts have emphasized an injury analysis that has been described as "an exercise in balancing depletions."41 Essentially, this approach seeks to keep the stream intact by ensuring that the depletion of the stream from the new use does not exceed the depletion of the stream caused by the original use. Historical use is measured by the depletion it has required.42 To prevent an enlargement in use to the injury of other appropriators, the new use should not result
in increased depletion of the stream. Colorado courts have emphasized that the determination of injury is fact specific and individual to each case. Consequently, even though the supreme court has considered numerous cases over the years centering on the matter of injury, there is remarkably little guidance to be found in these decisions.

Terms and conditions

Colorado law encourages transfers of water rights by providing that injury to other water rights may be offset by imposing terms and conditions upon the transfer in the decree. The statute suggests several types of terms and conditions, including limitation on the new use of the water, relinquishment of a part of the right being changed or of another related right, and limitations on the period of diversion. In addition, all change decrees now must include a condition providing for judicial reconsideration on the question of injury for some period determined to be necessary or desirable.

In 1989, the Colorado legislature enacted a law requiring the applicant to provide a proposed decree to the water court in any case in which a statement of opposition has been filed. The proposed decree is to prevent injury to other water rights. This requirement is intended to encourage discussions between the applicant and opponents prior to any formal hearing on the merits of the application.

Burden of proof

By statute, the applicant for a water right change carries the burden of showing that there will be no injurious effect. The Colorado Supreme Court provided the following rationale for this rule:

If a change is made, it disturbs the existing order and manner of distributing water diverted from our natural streams into irrigating ditches, which is performed by public officers, and causes a modification to be made in the general adjudication decree. It is fitting that a party who asks such relief should bear the burden of proving that the vested rights of others will not thereby be infringed if it is granted. It is only the burden which is usually imposed upon the moving party in a lawsuit.

The effect of this requirement is that the applicant carries the burden of proving a negative. Perhaps because of the difficulties inherent in so doing, several decisions indicate that there may be some requirement that the protesters demonstrate some injury. More recent decisions suggest that the burden on protesters only arises at the point that an applicant has made a "prima facie" showing of no injury.

Exchanges and Substituted Supplies

Under Colorado law, rights to use water may be exchanged as well as changed. As one commentator explains:

Exchange plans can be quite complicated in operation, but they rest on a simple concept. A user diverts water from the stream at a point which is physically desirable but at which the user has no senior diversion right. This diversion is legal if the user introduces an equivalent amount of water into the stream at another acceptable location.

This practice developed in the late 1800s in the Cache La Poudre River and Big Thompson River valleys in northern Colorado as a means of better capturing flows in these
rivers by allowing junior upstream reservoirs to divert water based on downstream senior priority rights in exchange for releases of stored water. Legislation enacted in 1897 gave legal status to this practice. It authorizes the owner of a reservoir to deliver stored water into a ditch or stream in exchange for an equal amount of water, less reasonable deduction for transport losses, further upstream. Exchanges may only be made when they do not cause other users injury, but state approval is not required.

In 1969, the legislature authorized the involuntary substitution of a water supply. Under this provision, a party may take a senior appropriator's entitlement so long as comparable substituted water is provided. Approval by the state engineer of substitute supply plans is necessary.

Colorado water law now provides for water court decrees recognizing an exchange established under either of the two authorizing sections just discussed. In such a proceeding, the original priority date or priority dates of the exchange are generally recognized and preserved.

The sufficiency of an exchange arrangement depends on several factors including the quantity of the exchange water, the location of exchange water deliveries, the timing of those deliveries, and the quality of the exchange water. As required by statute, the exchange water must be sufficient in quality and quantity to meet the senior appropriator's normal requirement of use. Water courts now are defining the meaning of these and other requirements associated with the use of exchanges.

**Plans for Augmentation**

Colorado water law contains a unique provision authorizing the creation of plans for augmentation. Originally envisioned as a device for integrating existing appropriations of tributary groundwater into the priority system for surface diversions, the major use of augmentation plans is to allow new, out-of-priority uses of water to proceed so long as "augmentation" actions are taken to protect existing water rights. Augmentation plans permit the new development and use of tributary groundwater in fully appropriated areas by replacing all depletions of the stream resulting from that use—typically through the retirement of an existing consumptive water right. Many changes of water rights in Colorado occur in connection with plans for augmentation.

The proponent of a plan for augmentation must file an application with the water court. The referee or judge uses the same standard of review as for a change of water right—that the plan will not result in injury to existing water rights. The decree may include terms and conditions to offset injury, and it must include retained jurisdiction to reconsider injury. The statute requires consideration of the depletions "in quantity and in time" associated with the use of water under the augmentation plan as well as the amount and timing of the replacement water being provided. Decrees approving augmentation plans must provide for curtailment of any out-of-priority diversions when the associated depletions are not being replaced so as to prevent injury.

A major attraction of the augmentation plan provision is that it permits new uses of water to occur in heavily appropriated areas so long as means are found to replace depletions from the new use. Common sources of replacement water include retirement of existing consumptive water rights, effluent from use of imported water, and nontributary groundwater. Exchanges and substitute supplies may be included in an augmentation plan. Concern has been raised about the hydrologic uncertainties and the complexity in administration associated with many augmentation plans. Experience to date, however, has been generally positive.
Temporary Changes of Water Rights

Colorado law authorizes the temporary loan or exchange of a water right. The exchange or loan may only be between those taking water from the same stream, and it must be either for the purpose of saving crops or for using the water in a more economical manner. There is no need to obtain a court decree for such temporary loan or exchange; however, notice in writing must be given to the division engineer including the length of time for which the loan or exchange is made.

Temporary changes also are limited by the no injury requirement. In the event of a challenge to a temporary loan or exchange, the proponent of the temporary change must affirmatively demonstrate that no injury will result.

Transferability of Special Categories of Water

The Colorado legal system has managed to transform the physically uniform substance of water into a sometimes bewildering array of legally distinctive categories. These legal distinctions can be important in understanding Colorado water transfer law. This section discusses designated groundwater, nontributary groundwater, imported water, salvaged water, conditional rights, contract water, interstate transfers, and tribal water.

Transfers of Designated Groundwater

The special statutory scheme that applies to groundwater within Colorado's eight designated basins authorizes the change in a permit right. The specific changes authorized include the acreage served, the volume of appropriation, the place, time, or type of use, and the well location. Application for the change is made to the Colorado Ground Water Commission and notice of the application and hearing is made public. The change may only be granted subject to "such terms and conditions as will not cause material injury to the vested rights of other appropriators."

The injury standard governing a change in a designated groundwater right is the same as that applying to other appropriative water rights. Specifically, possible increases in historical consumptive use and reductions in return flows are to be considered in determining if the change would cause material injury. The policy expressed by this standard is also the same: that a change of a water right may be allowed only when the change will not cause unreasonable harm to a prior appropriator.

Under the Colorado Ground Water Management Act, groundwater management districts may be established. These districts are authorized to regulate the use, control, and conservation of the groundwater within their area. Among the measures specified is the power to prohibit the use of groundwater outside the boundaries of the district where such use materially affects the rights acquired by permit by any owner or operator of land within the district.

The case of Danielson v. Vickroy illustrates the relationship between designated groundwater and other water in the context of a change proceeding. Vickroy held a ditch right for water diverted from Kiowa Creek, an intermittent stream, and sought to change the point of diversion to a well in the alluvial aquifer underlying the creek in a water court proceeding. The proposed well was within the boundaries of a designated ground water basin and a ground water management district. The district objected to the change on the basis that the ground water commission had exclusive jurisdiction to consider such an application. After reviewing the separate statutory schemes for designated groundwater and other appropriable water, the Colorado Supreme Court concluded that the creation of a designated basin places the
groundwater within that basin under the jurisdiction of the ground water commission. If the commission or, upon appeal, the district court determines that the groundwater being sought in the change proceeding is not designated groundwater then the application may be considered by a water court.  

Transfer of Nontributary Groundwater

In 1985, the Colorado legislature firmly established a right to groundwater in certain locations and formations based on land ownership rather than appropriation. Two such categories of groundwater were established: "nontributary" groundwater and groundwater within aquifers in the area known as the Denver Basin.

Allocation of this groundwater is based on two factors: the quantity of water underlying the land and an aquifer life of 100 years. This water may be developed either by the landowner or by one who has the consent of the landowner. Once established, the nontributary groundwater right closely resembles other appropriative groundwater rights. It provides the right to pump a certain quantity of water annually from a specified well location for designated types and places of use.

The transferability of nontributary groundwater should be facilitated by its status as water effectively owned by the overlying landowner. This water is not available for appropriation, and its development is contingent upon a determination of replacement to the stream necessary to offset depletions. So long as dominion over the water is maintained, it may be used to extinction or otherwise transferred without regard to return flow obligations.

Imported or Foreign Water

Water introduced into a stream system from a completely unconnected stream system, known as imported or foreign water, is accorded a special status under Colorado law. By statute, the appropriator of imported or foreign water "may make a succession of uses of such water by exchange or otherwise to the extent that its volume can be distinguished from the volume of the streams with which it is introduced." To reuse the water, the appropriator must keep careful records accounting for the quantities of imported water that he uses. When this water leaves the direct control of the user, it becomes available for use by downstream users but no permanent rights to this water may be established by these users.

Because this water, like nontributary groundwater, is not part of the native flows upon which in-basin appropriators may rely for satisfying their rights, imported water provides an unusually flexible source of supply. So long as it remains within the dominion and control of the user, it may be used and reused to extinction. Increasingly, the effluent from the use of imported water is being used as the basis for an exchange or a substituted supply.

Transfers of Salvaged Water

Generally, the transfer of a water right is limited to its historical consumptive use—essentially the depletion of the stream caused by the diversion of water and application of that water to beneficial use. In the case of irrigation, depletions result from use by crops, evaporation losses, use by other vegetation, and ground seepage which is lost to the stream. Salvaged water is water otherwise unavailable for beneficial use that is saved by some means and made available. The law in Colorado concerning the legal status of salvaged water is unclear.

The Colorado Supreme Court has denied efforts to gain rights to salvaged water through eradication of phreatophytes and through removal of peat moss. Still unanswered, however, is the question whether someone may be able to salvage a portion of
an existing right that presently is being evaporated, consumed, or otherwise lost to beneficial use and either expand his own use or transfer the salvaged water so long as there is no injury to other water rights. At least one early Colorado case seems to approve the idea that more economical use of one's water could enable the use of the saved portion on additional lands through a change of use proceeding and subject to the no injury requirement. The absence of any efforts to use salvaged water to date may reflect the relatively small amount of water that can be realized by such efforts in most situations compared with their cost. Better technical analysis of this issue is needed.

Transfer of a Conditional Water Right

Colorado law considers a conditional water right to be a vested property interest. Changes of conditional water rights are specifically authorized by statute. As a general matter the rules applying to the change of any water right apply in the case of a change of a conditional water right.

In fact, however, there are some peculiarities in the case of conditional water rights that raise special issues. No water has ever been diverted and applied to a beneficial use in the case of a conditional water right; there is only the specific intent to do so, coupled with overt actions sufficient to give notice of that intent. Conditional rights are protected only to the extent that due diligence in pursuing this intent or plan is exercised. A change may involve a completely different use of the water in contravention of the intent upon which the right was granted. Or the change may be made as a means of making developable an otherwise infeasible project.

Nevertheless, changes in conditional water rights have been permitted, and special problems in evaluating injury under such changes have been considered. The transferable quantity of water has been determined to be the amount "contemplated" under the conditional decree so that there would be no injury to junior appropriators from the change.

Transfers of Contract Water

Water may be supplied for use under contract by another individual or entity holding the appropriative water right. The rights to such water are primarily defined by the terms of the contract, and are voluntarily established. Colorado law does affect contract rights in some circumstances. For example, a carrier ditch company is required by statute to provide water to the classes of users it is incorporated to serve whenever it has water in its ditch unsold, and to have the rates for furnishing this water fixed by the board of county commissioners. Contract provisions have been struck down in several cases because they were found to be inequitable to the water users and against public policy.

Green v. Chaffee Ditch Company illustrates the differences between the legal right to change an appropriative water right and the right to change a water contract. Holders of a contract right for irrigation water supply sought to sell this right to a city. The original appropriative right had been conveyed to a ditch company in 1870 in return for a contract right to an equivalent amount of water for irrigation of specified lands. The supreme court noted that "such a contracted right is far different from the 'water right' acquired by [the original appropriator]. Originally the right [of the appropriator] had the status of real property and could be conveyed without reference to the land on which it had been used." Following his agreement with the ditch company, the former appropriator "becomes only a consumer whose rights were determined by contract...."

Bureau of Reclamation projects supplied about 2.4 million acre-feet of water
for use in Colorado in 1986. In most cases, a conservancy district established under Colorado law holds the appropriative water right and allocates the water from the Reclamation project to users within the district on some kind of contract or allotment basis. There are considerable differences in allocation and transfer approaches among the districts. Colorado law specifically empowers conservancy district boards to allocate and reallocate water and to provide for the transfer of water.

Interstate Transfers

Colorado law subjects the right to transport water out of state to several conditions. The proposed use of water out of Colorado either must be expressly authorized by interstate compact, be credited as a delivery under a compact, or be determined not to impair Colorado’s ability to comply with its legal obligations to other states. The use must be found consistent with the reasonable conservation of Colorado’s water resources. And the proposed out-of-state use must not limit in-state beneficial uses of water apportioned to Colorado by interstate compact or judicial decree. In addition, a fee of $50 per acre-foot is assessed against all water exports.

Transfers of Tribal Water

Federal law restricts the rights of tribes to lease or sell their property rights. The trust limitation, however, may be waived in specific circumstances by Act of Congress. In fact, Congress has enacted several pieces of legislation authorizing certain tribes to lease or sell water for off-reservation use.

To help settle the reserved right claims of the only two tribes with reservations in Colorado, Congress enacted the Colorado Ute Indian Water Rights Settlement Act in 1988. Water from the Dolores and Animas-La Plata projects is to be supplied to the tribes in satisfaction of these reserved water rights.

Authority for the tribes to lease or sell water off-reservation proved highly controversial in this situation. Lower Colorado River Basin states opposed allowing the tribes to sell their water to users in that area. Compromise legislation restricts disposition of this tribal water, and makes water leased or sold for off-reservation use subject to Colorado water rights laws.

Transfers and Water Supply Organizations

Much of Colorado’s water has been developed for use through the efforts of water supply organizations. Most of these entities originally were established to provide water for irrigation. Some are organized specifically to provide water for municipal purposes. This section examines Colorado law respecting the transferability of the water and water rights held by mutual ditch companies, irrigation districts, water users associations, conservancy districts, and municipalities.

Mutual Ditch/Mutual Reservoir Companies

The shareholders of a mutual ditch or reservoir company are also the beneficial users of the water and the equitable owners of the water rights and the conveyance and storage facilities. Shareholders are entitled to receive a pro rata quantity of the water available to the company under its water rights based on the number of shares of stock held by the shareholder. The priority of shareholders’ rights to water within a mutual supply company may vary, often according to different classes of stock.

A mutual supply company shareholder holds both a real and a personal property right. Shares of stock are deemed personal property which may be transferred in a manner consistent with state law and the company’s by-laws. A transfer involves both the assignment of the stock certificate and the application of water to a beneficial use by
the transferee. If the transfer involves a change of the water right, the transfer must be judicially approved.

As with other appropriative rights, such a change is subject to the no injury rule. Because of the unique interrelationship among shareholders in a mutual company, courts have developed a more restrictive reading of the no injury rule in such shareholder change proceedings. Established patterns of usage may not be altered to the detriment of other shareholders. The court will impose conditions on the transfer to prevent potential injury to the remaining shareholders.

Mutual ditch companies may establish requirements in their by-laws affecting the right of shareholders to transfer their share interests. For example, transfers may be subject to approval by the companies’ Board of Directors. Or restrictions may be placed on the manner, type or place of use. Generally, as with contracts, transfer limitations contained in by-laws are valid as long as they are reasonable and not against public policy.

**Irrigation Districts**

The structure of ditch companies made them inadequate for financing large irrigation projects. To respond to the need for a quasi-municipal corporation to facilitate such development, Colorado law initially authorized irrigation districts in 1901. An irrigation district holds title to the district’s water right in trust. The district has the power to transfer its water rights, although prior electorate approval and court order may be required. Transfers by the district are not limited to the district boundaries. No sale of water rights may infringe on other water rights or conflict with state water law. Districts formed under the 1921 Act may lease surplus waters for use within or without the district boundaries.

**Water Users Associations**

Water users associations were authorized originally in 1905 as another type of entity able to contract with the Bureau of Reclamation to receive project water. Colorado law authorizes water users associations to assess their members as necessary to repay obligations to the Bureau. There is no state statutory restriction on the transfer of water by the association or its shareholders.

**Conservancy Districts**

Conservancy districts have an ability to tax all lands within the district irrespective of whether they directly receive water. The board of directors of a conservancy district is given broad power to obtain and dispose of property, to enter contracts, and to levy taxes and assessments. The board has the authority to allocate and reallocate water within the district, and to permit a beneficial user to transfer his water to other lands within the district. District boundaries may be altered by petition from landowners or municipalities to either the board or the court for inclusion of their lands within the district. In 1989, the Colorado legislature authorized districts to lease or exchange water for use outside district boundaries. There can be no permanent transfers of water rights outside district boundaries, however.

**Municipalities**

The major source of new demand for consumptive use of water in Colorado is related to urban growth. Water supplies for municipal purposes, including commercial activities, commonly are supplied either by city water departments or by special water districts in Colorado. Municipalities may obtain water by appropriation, by purchase, by condemnation, or by lease. Because of their need to plan for future growth and development, courts have allowed cities to
Section 2: Changes of Water Use, 1975-1984

Changes in appropriative water rights involving a change in the purpose or place of use of water are common in Colorado. To document the level of activity and identify characteristics of water right changes, researchers examined the records of all change-of-water-right applications filed with the seven water courts between 1975 and 1984. Because we were interested in changes of water use, we excluded the numerous applications involving only changes in the point of diversion. We utilized the centralized records at the State Engineer's office in Denver for our data collection effort during the summer of 1988. This section summarizes our findings regarding the level of change-of-water-right activity, characteristics of the changes, and the change process.

Change Activity

As shown in Table 2.1, there were 858 applications for changes of water rights involving a change of water use between 1975 and 1984. Of these applications, 29 percent involved changes within Water Division One—the most populated area of the state, generally encompassing the South Platte River basin (see Figure 2.1). Forming a second tier in activity level are Divisions Five, Two, Seven, and Four (in order of level of activity). Division Five includes the mainstem of the Colorado River. Division Two covers the Arkansas River basin. Division Four includes the Gunnison River basin. There was relatively little activity in Divisions Three and Six.

Most of these applications were approved. Overall, 689 or 80 percent of the applications were approved. All of the applications in Divisions Five and Six were approved (see Figure 2.2). By comparison, 64 percent of the applications in Division One were approved. Statewide, only 11 applications were denied. About ten percent of the applications were withdrawn by the applicants. Nearly 70 percent of the applications still pending as of July 1988 were in Division One.

Figure 2.3 shows the number of applications by year. The highest number of applications filed during this period was in 1982. No clear trends are discernible from these data. The annual number of applications by division are shown in Figures 2.4 and 2.5.

Characteristics of the Changes

About 75 percent of the change applications involved a proposed shift of water use from primarily agricultural to primarily non-agricultural uses (see Figure 2.6). The proportion in Division One was 83 percent. About 11 percent of the change applications involved changes of use within the agricultural sector. About 13 percent of the applications proposed changes within the non-agricultural sector.

The single most common purpose for a change of a water right was to support a new use under a plan for augmentation. About 50 percent of all change applications were part of a plan for augmentation (see Figure 2.7). In Divisions One, Two, and Five, 66 percent of the change applications were part of a plan for augmentation. In Division Six, only 8 percent of the change applications involved augmentation plans.

The quantities of water involved in approved applications are shown in Figure 2.8 and 2.9. Figure 2.8 shows quantities for water rights described in cubic feet per second (cfs). For cases where this information was available, half involved 0.5
NUMBER OF APPLICATIONS BY DIVISION AS A PERCENTAGE OF TOTAL 1975-1984

DIVISION 1 (29.5%)
2 (14.2%)
3 (7.3%)
4 (12.4%)
5 (17.0%)
6 (5.8%)
7 (13.8%)

Figure 2.1.
NUMBER OF APPLICATIONS BY DIVISION AS A FUNCTION OF STATUS 1975-1984

Figure 2.2.
NUMBER OF APPLICATIONS FILED BY YEAR

Figure 2.3.
NUMBER OF APPLICATIONS BY YEAR FOR DIVISIONS 1, 2, AND 3

Figure 2.4.
NUMBER OF APPLICATIONS BY YEAR
FOR DIVISIONS 4, 5, 6, AND 7

Figure 2.5.
Figure 2.6.

PROPOSED SHIFT IN NATURE OF WATER USE AS A PERCENT OF ALL APPLICATIONS 1975-1984

- Ag to Ag: 11.1%
- Ag to Nonag: 75.4%
- Nonag to Ag: 12.8%
- Nonag to Nonag: .7%
CHANGES INVOLVING AUGMENTATION
AS A FUNCTION OF TOTAL APPLICATIONS
BY DIVISION
1975-1984

For all applications except pending

Figure 2.7.
PERCENT OF TRANSFERS ASSOCIATED WITH VARIOUS QUANTITIES OF WATER TRANSFERRED IN CUBIC FEET PER SECOND
1975-1984

For Approved Applications

Figure 2.8.
PERCENT OF TRANSFERS ASSOCIATED WITH VARIOUS QUANTITIES OF WATER TRANSFERRED IN ACRE-FEET 1975-1984

Figure 2.9.
Figure 2.10.

SOURCE OF WATER INVOLVED AS A PERCENT OF ALL PROPOSED CHANGES 1975-1984

- S->G (18.5%)
- G->S (0.7%)
- G->G (11.4%)
- S&G->S&G (2.4%)
- S->S (67.0%)

Legend:
- Surface and Ground Water to Same
- Ground Water to Ground Water
- Ground Water to Surface Water
- Surface Water to Ground Water
- Surface Water to Surface Water
CHANGES INVOLVING STATEMENTS OF OPPOSITION AS A FUNCTION OF TOTAL APPLICATIONS BY DIVISION 1975-1984

Figure 2.11.
AVERAGE TIME TO DECISION
AS A FUNCTION OF FINAL RULING
1975-1984

Figure 2.12.
PERCENT OF TOTAL APPLICATIONS
BY LENGTH OF TIME TO DECISION

1975-1984

% OF ALL APPLICATIONS

35
30
25
20
15
10
5

MONTHS TO DECISION

0-6
6-12
12-24
24-48
>48

For all cases except pending

Figure 2.13.
PERCENT OF APPROVED CASES OPPOSED AS A FUNCTION OF MONTHS TO DECISION

Figure 2.14.
cfs or less. About 21 percent involved water quantities between 1 and 5 cfs. For water rights quantified in acre-feet (AF), about half involved 10 AF or less.

In Colorado, surface water rights are predominately involved in change applications. For those cases where this information was discernible, 67 percent involved surface rights only (see Figure 2.10). In 18 percent of the cases, a surface water right was being changed to a groundwater right.

**The Change Process**

In addition to information regarding characteristics of the changes, we also collected data providing a picture of the change process itself—particularly concerning the level of opposition and the length of time to decision. The number of cases in which statements of opposition were filed is shown in Figure 2.11. About 61 percent of all applications drew at least one formal statement of opposition. There is considerable variation among the divisions. In Division One, statements of opposition were filed in 84 percent of the cases. The frequency was much lower in Divisions Four, Six, and Seven.

The average time for a final action in these cases was about 21 months (see Figure 2.12). For applications that were approved, the average time to decision was about 19 1/2 months. For the 11 cases that were denied, the average time to decision was about 27 months. The decision to withdraw averaged nearly 33 months.

Final decision was reached in six months or less in about 14 percent of the cases (see Figure 2.13). About 40 percent of the cases are resolved within one year of the application. Another 27 percent of the cases are resolved during the next year. Nearly 10 percent of the cases required more than four years to resolve.

There is a strong correlation between the length of time to decision and whether a statement of opposition was filed. This relationship is shown in Figure 2.14.

**Section 3: Transaction Cost in Colorado: A Case Study**

A major objective of this study has been to see the extent to which transaction costs differ among the various state water transfer systems. Transaction Costs (TR) comprise a large set of costs that are incurred during a water transfer and are borne either by the buyer, the seller, state agencies, or in part by all three. They include the following:

1. search costs incurred by buyers or sellers;
2. brokerage fees;

### Table 2.1: Applications for Change of Water Use, 1975-1984
(by division and by status) (as of July 1988)

<table>
<thead>
<tr>
<th>Water Division</th>
<th>Approved</th>
<th>Denied</th>
<th>Pending</th>
<th>Withdrawn</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>163</td>
<td>3</td>
<td>51</td>
<td>36</td>
<td>253</td>
</tr>
<tr>
<td>2</td>
<td>93</td>
<td>4</td>
<td>10</td>
<td>15</td>
<td>122</td>
</tr>
<tr>
<td>3</td>
<td>41</td>
<td>2</td>
<td>5</td>
<td>15</td>
<td>63</td>
</tr>
<tr>
<td>4</td>
<td>89</td>
<td>1</td>
<td>3</td>
<td>13</td>
<td>106</td>
</tr>
<tr>
<td>5</td>
<td>146</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>146</td>
</tr>
<tr>
<td>6</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>689</td>
<td>11</td>
<td>74</td>
<td>84</td>
<td>858</td>
</tr>
</tbody>
</table>
3. public agency review, hearing and administrative costs;
4. application and publication fees;
5. costs incurred by the buyer, seller, and objectors for legal help;
6. costs incurred by all of these parties for technical studies of hydrology and consumptive use;
7. positive or negative externalities imposed on third parties even after the precautions taken by the water authority to avoid third party damage.

It is clear that transaction costs, along with physical transfer costs create a "wedge" or separation between the buyer's willingness to pay for water at the intended point of use and the seller's reservation price or willingness to accept compensation for the water being sold from an existing use. Thus the lower the transactions costs per acre-foot transferred, the greater will be the opportunity for beneficial transfers.

This section analyzes a stratified random sample of cases drawn from the State Engineer's records of approved water transfers, excepting simple changes in points of diversion, to see what characteristics of the transfer process appear to affect total transaction costs, public and private. The initial goal was to obtain twenty complete cases. This meant that complete cost information would need to be obtained from the applicants, opponents, courts, etc. for each case drawn. Despite intensive efforts, only 9 cases were completed. There were several reasons for this.

(1) The 10-year period from which the cases were chosen, 1975-1984, extended too far back to make it possible to find cost data on many of the cases. Several earlier cases, especially in the 1975-1979 period, were so old that the principal transactors were either deceased or were no longer associated with the firm that made the transaction.

(2) Some water transfer cases chosen were just one of several cases filed jointly in water court by an applicant. In such cases, the applicant might be able to provide a total cost analysis for the combined cases, but could not identify the costs and time involved for the single sample case selected.

(3) The most frequent reason for being unable to provide the requested cost information was that it was too costly for the respondent to do so. This was especially true for cities and large companies that are routinely involved in buying and/or selling water. The information was available, but having a staff member or someone familiar with the case dig through old records required too much time.

(4) It became apparent after talks with all seven division water court clerks that court costs (primarily the time the referee and/or judge and staff spend on the case) associated with particular transfers were difficult to isolate. Judges and referees do not keep a time-log of time they spend reviewing and preparing for each water transfer case. A staff member typically brings in a stack of ten to twenty cases that the referee or judge reads over, makes notes on, and prepares for ruling, hearing, or trial. However, the time spent on each case is not recorded. Only one water division in the seven state divisions has a full-time salaried referee (Division One), while the other divisions contract for referees on an hourly or daily basis. The referee then bills the State according to the number of rulings he has completed that day. While he may know that he completed three rulings, he does not note how many hours are spent on each case.

Phone interviews with all referees suggested that recording the time spent on each case would not be a good use of their time. When the suggestions were made to them that it would be interesting to know what a cost accounting on each case would reveal about the costs of different types of
cases (small versus large transactions, pro-se cases, cases with a large number of opposers, etc.) or that efficiency might be increased if it were known what kinds of cases took more time, responses typically were that cost accounting would take a lot of time, would be inconvenient and really would be useful only to people who are interested in "figuring out if the state water court system is being efficient."

When pressed for estimates of time spent on a "typical" case, referees said there was no such thing as a "typical" case. Nonetheless, six of the seven referees supplied estimates of time spent on typical cases and the corresponding cost. The cost estimates were different for different divisions because of variations in the total number of transfer cases that move in that particular division, the percentage of cases that are typically opposed, whether or not the referee makes a field check, etc. Estimated court costs do not take into account the overhead needed in running the court. Our estimates thus underestimate the actual costs involved.

Two points should be noted before beginning the analysis of the cases. (1) All cases have had the flow rate (cfs) converted to a volumetric quantification, usually corresponding to the historic consumptive use. (2) The objective of obtaining costs from all opposers in every case was not attained. However, in all cases having opposers, at least one opposer sent in cost information. It was noted by several lawyers that the opponents frequently agree upon one party to pursue the objection, the costs to be divided later or the responsibility rotated for other cases. For this reason, we feel we have captured most of the costs incurred by opposers.

The data generated from the completed sample cases are given in Table 3.1. The standard measure of cost is average cost per acre-foot transferred. The hypotheses concerning factors affecting ATRC are:

H1: there are scale economies in transaction costs, i.e. ATRC should decrease with size;
H2: the presence of opposition will increase ATRC;
H3: the more senior the rights being transferred, the more likely that there will be opposition;
H4: the larger the transaction, the more likely opposition;
H5: opposition is more likely if the stream is frequently administered;
H6: transaction costs have risen over time.

These hypotheses were translated into a two equation model, the first equation "explaining" the level of transactions costs per acre-foot (ATRC) and the second "explaining" the occurrence of opposition:

\[(1) \quad ATRC = f (AF, ONO, T)\]
\[(2) \quad ONO = g (AF, ADM, T)\]

Hypotheses 1, 2, and 6 are embodied in equation (1), while hypotheses 3, 4, and 5 are embodied in equation (2). The priority date itself, while presented in Table 3.1 has little significance across different streams, since an 1890 right may be very senior on one stream but very junior on another.

The first stage of the analysis was the estimation of a PROBIT model for equation (2) since ONO is a zero - one variable. The PROBIT estimate of equation (2) was

\[(2a) \quad ONO = 0.75 AF - 1.07 ADM - 0.74T \]
\[\quad (1.16) \quad (0.71) \quad (1.14)\]

where the asymptotic "t" ratio is given in parentheses. None of the coefficients is statistically significant and the signs of ADM and T are contrary to expectations. The lack of significance is, at least in part, due to the small number of observations.
TABLE 3.1. Data From 9 Colorado Case Studies

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Transactions Costs per AF in 1982 - 84 Dollars (ATRC)¹</th>
<th>Size In Acre-Feet (AF)</th>
<th>Opposition Dummy Variable (ONO)²</th>
<th>Admin. Dummy Variable (ADM)³</th>
<th>Priority Date ⁴</th>
<th>Date Decree Issued (T)⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.68</td>
<td>3275.00</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>78</td>
</tr>
<tr>
<td>2</td>
<td>302.69</td>
<td>2.00</td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>84</td>
</tr>
<tr>
<td>3</td>
<td>400.00</td>
<td>113.00</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>83</td>
</tr>
<tr>
<td>4</td>
<td>1.38</td>
<td>145.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>83</td>
</tr>
<tr>
<td>5</td>
<td>13.05</td>
<td>800.00</td>
<td>0</td>
<td>1</td>
<td>60</td>
<td>82</td>
</tr>
<tr>
<td>6</td>
<td>990.44</td>
<td>0.37</td>
<td>0</td>
<td>1</td>
<td>89</td>
<td>83</td>
</tr>
<tr>
<td>7</td>
<td>1702.00</td>
<td>12.00</td>
<td>1</td>
<td>0</td>
<td>56</td>
<td>84</td>
</tr>
<tr>
<td>8</td>
<td>2.03</td>
<td>188.00</td>
<td>0</td>
<td>0</td>
<td>84</td>
<td>86</td>
</tr>
<tr>
<td>9</td>
<td>0.37</td>
<td>1039.00</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>82</td>
</tr>
</tbody>
</table>

1 Adjusted to 1982 - 84 dollars using the Consumer Price Index.
2 ONO = 1 if the transfer was opposed by one or more parties.
3 ADM = 1 if the Division Engineer judged that the stream involved was frequently administered, i.e. priority restrictions invoked.
4 Priority dates start with 1890 = 0.
5 Date of issuance of final decree, 1900 omitted.

TABLE 3.2. Estimated ATRC Values From Equation (1a)

<table>
<thead>
<tr>
<th>Size of Transfer (AF)</th>
<th>Unopposed</th>
<th>Opposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>458</td>
<td>1118</td>
</tr>
<tr>
<td>100</td>
<td>117</td>
<td>777</td>
</tr>
<tr>
<td>200</td>
<td>15</td>
<td>675</td>
</tr>
</tbody>
</table>

Trial regressions and data plotting indicated that scale economies would best be represented by the natural logarithm of AF. Thus, the estimate of equation (1) is

(1a) \[ \text{ATRC} = 799 - 148 \ln AF + 660 \经开(ONO) ^2 \text{AF} \]

where the "t" statistics are given in parentheses and the adjusted R-squared is 0.61. All coefficients are highly significant. Table 3.2 exhibits ATRC values from this equation.

Equation (1a) indicates that there are significant economies of scale and that opposition greatly increases ATRC.

**Conclusions**

To understand the motivation for water transfers, one must understand the structure of costs lying between the buyer's willingness-to-pay and the seller's willingness-to-accept payment for different quantities of water. Transactions costs constitute a major part of those intervening costs in many cases, so it becomes necessary to understand the relationship between transaction costs and characteristics of the transfer that influence those costs.

The small data set, analyzed through regression analysis, strongly suggests very significant economies of scale. The presence
of opposition raises costs, and opposition rises with size of the transfer, but not enough to offset the scale economy factors within the range of transactions studied here.

Section 4: Case Studies

This section reports the results of case studies that were used to obtain a more detailed analysis of water transfers in Colorado. First, we examined a random sample of cases drawn from those cases filed between 1975 and 1984 that were approved. Second, we examined transfer activity in three areas of Colorado: the Clear Creek basin, South Park, and the Arkansas River basin. In these analyses we were interested in considering water transfers over time and in relation to a geographic area.

Analysis of Randomly Selected Cases

A stratified random sample of twenty-one cases was selected from the total of 689 approved decrees. Analysis of these cases yields a picture of a "typical" change of water right in Colorado.

Based on the sample, a change-of-water-right case is very likely to involve a change in the point of diversion and a change in the type of use (see Table 4.1). It is also likely to involve a change in the place of use. It may involve a change in time of use. The use of the original water right(s) typically was for irrigation. Most of these rights were to use surface flows.

Most often, the change in use was to a broader set of uses. Two cases decreed the changed right for "all beneficial uses." Many cases included domestic use as one of the new uses. Interestingly, a few of the sample cases involved a change in use to recreation or fish and wildlife protection purposes. About half of the cases involved a plan for augmentation. In many cases, the new point of diversion for the changed right is a well.

Applications to change water rights are very likely to draw statements of opposition in Colorado (see Table 4.2). This is especially true if the application is filed in Divisions 1, 2, or 5. In a few cases, the state engineer may be one of the opposers. The most common types of objection were: failure of the applicant to adequately demonstrate that there would be no injury; an enlarged use of water would result from the proposed change; the original water rights sought to be changed were abandoned or never perfected; or the new uses were not adequately specified. Those cases involving statements of opposition took longer to complete than those without opposition, and there was a general correlation between the number of objectors and the length of time to complete. Only one case in the sample went to trial.

In most cases the changed water right retained the same rate of diversion as under the original right. Commonly, however, limitations were placed on the new diversion right. In several cases a specific volumetric limit was established. In a few cases the new use was limited to historical consumptive use of the original right, but no evidence of that consumptive use was provided in the decree. In general, the cases reflected little disagreement concerning historical consumptive use, but there was considerable discussion of assumptions concerning consumption in the new use.

In addition to terms and conditions limiting the changed right on the basis of historical consumptive use, decrees commonly required metering of new wells or use of other measuring devices, record keeping, and regular reports to the division engineer—particularly in cases involving plans for augmentation. Where specified, the most common period for continuing jurisdiction by the water court was five years. A few cases required that lands previously irrigated be dried-up. A few cases place specific limits on the new use, such as in-house domestic use only.
TABLE 4.1. Type of Change for Sample Transfer Cases

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Out of 21 Total</td>
</tr>
<tr>
<td>Change in type of use</td>
<td>18</td>
</tr>
<tr>
<td>original use type</td>
<td>14</td>
</tr>
<tr>
<td>irrigation</td>
<td>1</td>
</tr>
<tr>
<td>domestic</td>
<td>2</td>
</tr>
<tr>
<td>municipal</td>
<td>1</td>
</tr>
<tr>
<td>industrial, commercial</td>
<td>1</td>
</tr>
<tr>
<td>new use type*</td>
<td></td>
</tr>
<tr>
<td>agriculture</td>
<td>0</td>
</tr>
<tr>
<td>domestic (&amp; lawn irrigation)</td>
<td>8</td>
</tr>
<tr>
<td>municipal</td>
<td>5</td>
</tr>
<tr>
<td>industrial, commercial, mining</td>
<td>9</td>
</tr>
<tr>
<td>recreation, fish, wildlife, instream</td>
<td>3</td>
</tr>
<tr>
<td>all beneficial uses</td>
<td>2</td>
</tr>
<tr>
<td>New or additional points of diversion</td>
<td></td>
</tr>
<tr>
<td>old diversion surface water</td>
<td>13</td>
</tr>
<tr>
<td>old diversion ground water</td>
<td>2</td>
</tr>
<tr>
<td>new diversion surface water</td>
<td>5</td>
</tr>
<tr>
<td>new diversion ground water</td>
<td>9</td>
</tr>
<tr>
<td>New or additional place of use</td>
<td>19</td>
</tr>
<tr>
<td>Change to longer season of use</td>
<td>9</td>
</tr>
</tbody>
</table>

A closer look at a few of the sample cases illustrates both typical and unique conditions and issues in Colorado transfer proceedings. In transfers involving plans for augmentation, applicants along the Front Range may propose the use of nontributary groundwater to augment streamflow depletions. The Stroh Ranch application is an example of this type of transfer plan.

The applicant sought the use of several tributary wells and not nontributary wells and new junior surface water rights from the alluvium of Cherry Creek in its plan. Water withdrawn from the wells (tributary, nontributary and not nontributary) was to supply water to the Stroh Ranch Development. To prevent injury to vested water rights, the applicant proposed to cease pumping of certain tributary wells and to take credit for historic stream depletions from these wells as an offset against new well depletions and also to return additional water to Cherry Creek or its alluvium from nontributary and not nontributary sources. The court retained jurisdiction on the question of injury for an unusually long period - 15 years, or until 70 percent of the land area is developed, whichever occurs first.

Compensation to the stream system may be required with plans for augmentation like the Stroh Ranch plan, to make up for out-of-priority pumping. It may also be required where there is no augmentation plan, to prevent injury to other vested water rights that might otherwise result from the proposed transfer. The proposed water
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number of cases out of 21 total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involved plan for augmentation</td>
<td>10</td>
</tr>
<tr>
<td>Involved water exchange</td>
<td>2</td>
</tr>
<tr>
<td>Statements of opposition filed no. filed in water divisions 1, 2 or 5</td>
<td>14</td>
</tr>
<tr>
<td>Terms and Conditions</td>
<td></td>
</tr>
<tr>
<td>compensation to stream system to prevent injury to co-owners of ditch co.</td>
<td>1</td>
</tr>
<tr>
<td>for out-of-priority diversions/pumping</td>
<td>5</td>
</tr>
<tr>
<td>for loss of return flows</td>
<td>1</td>
</tr>
<tr>
<td>for transportation losses</td>
<td>2</td>
</tr>
<tr>
<td>for evaporation losses</td>
<td>2</td>
</tr>
<tr>
<td>by abandonment of direct flow rights</td>
<td>5</td>
</tr>
<tr>
<td>installation of measuring device</td>
<td>12</td>
</tr>
<tr>
<td>record keeping and reporting</td>
<td>7</td>
</tr>
<tr>
<td>removal of lands from irrigation</td>
<td>6</td>
</tr>
<tr>
<td>restrict type of sewage treatment system</td>
<td>4</td>
</tr>
<tr>
<td>require formation of homeowner’s group</td>
<td>3</td>
</tr>
<tr>
<td>limit or prohibit yard irrigation</td>
<td>4</td>
</tr>
<tr>
<td>designate use preferences if shortage</td>
<td>1</td>
</tr>
<tr>
<td>plug and abandon old wells</td>
<td>1</td>
</tr>
<tr>
<td>limit rate, season and annual volume to historic pattern of use</td>
<td>4</td>
</tr>
<tr>
<td>continue to pay ditch co. assessments</td>
<td>1</td>
</tr>
<tr>
<td>reduce other water rights of applicant</td>
<td>1</td>
</tr>
<tr>
<td>retain jurisdiction on question of injury (2-15 yrs.)</td>
<td>12</td>
</tr>
<tr>
<td>Legal issues</td>
<td></td>
</tr>
<tr>
<td>decreed abandonment for some or all water rights</td>
<td>2</td>
</tr>
<tr>
<td>transfer credit for evapotranspiration</td>
<td>1</td>
</tr>
</tbody>
</table>

Supply for a residential development near Gunnison, Colorado illustrates this point. The plan was to use 39 wells, one for each single family residence, for domestic and light irrigation use. Ditch rights that had historically been used to irrigate the lands on which the subdivision would be built would be abandoned, with the water instead being withdrawn from the wells. The applicant also planned to enlarge and deepen a storage pond and construct a dam in order to store additional water for year-round use. The court found that the plan would place an additional burden on the watershed that could be addressed by foregoing diversion of some of the water from the irrigation ditches.153

The abandonment of direct flow rights may also be required in cases involving only surface diversions. The City of Lafayette sought to change the point of diversion for water rights previously tied to the South Boulder and Bear Creek Ditch. The water instead would be used on a direct flow basis from another ditch, or stored in one of several reservoirs. The court allowed the change, setting limits on the season and rate of diversion and requiring the applicant to abandon certain water rights to the stream to prevent injury.154 In a separate transfer case
involving a similar condition, the court expressly held that this type of abandonment does not constitute a legal abandonment of water or water rights.135

Legal abandonment may be declared, however, where the evidence in a transfer case demonstrates that the water rights sought to be changed have in fact not been used for many years.136 In an extreme case, the court found that more than one-third of the water rights the applicants sought to change had been abandoned. The applicants, two companies operating coal mines in Las Animas County, applied to the water court for a change of several agricultural water rights to year-round use for mining and mining-related uses, and the modification of other rights for storage. The change application listed 20 separate water rights totalling about 60 cubic feet per second (cfs). In approving the change, the court determined that only 5 water rights totalling 20.1 cfs could be changed.137 As discussed below, a de facto abandonment may be found where the court reduces the allowable transfer amount because of historic use patterns.138

In determining the quantity of water that may be transferred, courts generally look at the historical use of the water regardless of the amount of water awarded in the original decree. One case from the sample involved the question of whether the transferable consumptive use should include that amount attributable to vegetation growing along the ditch. The Town of Silverthorne alleged that it should be permitted to transfer to its new point of diversion its historic consumptive quantity plus the amount of water previously consumed by vegetation along the ditch. The Town of Silverthorne alleged that it should be permitted to transfer to its new point of diversion its historic consumptive quantity plus the amount of water previously consumed by vegetation along the Graff Ditch. In pretrial proceedings, the water court ruled that if the water was lost to the vegetation during transport from the point of diversion to the place of beneficial use, it may be included in the quantity transferred to a new point of diversion.139

While it is not unusual for a transfer to involve conditional water rights,140 it is rare for a court to change decreed absolute rights to conditional rights with a newer priority date. This was done in one of our sample transfer cases from Division 2. The requested change in use was approved for eight-ninths of an absolute right, but the changed quantity became a conditional water right with a priority date as of the application date, resulting in a 13 year loss of priority.141 The Division Engineer had recommended these terms for the change request because the source, a natural spring, may be tributary to the Arkansas River system and so subject to a call by downstream senior water rights.142

A final illustrative case from our sample involved a change to an alternate use for instream flow purposes. The City of Aspen and the Colorado Water Conservation Board jointly filed an application pursuant to an agreement entered into between the applicants, the Southeastern Water Conservancy District and the Pitkin County Commissioners.143 The Board was to acquire by license from Aspen the right to use certain of the city's water rights for minimum flow purposes. The applicants wanted to add the beneficial use of instream flow to the existing decreed uses.144 The Board sought to use the water at such times as any of its other minimum flow decrees in the same creek are out of priority, but the instream flow use would be subject to Aspen's need for the water. The court approved the change request, attaching conditions to prevent injury to objectors.145

Clear Creek, Colorado

Clear Creek basin is located in central Colorado and is bordered by the Continental Divide to the west, and the confluence of Clear Creek and the South Platte River within the City of Denver to the east (see Figure 4.1). The basin is comprised of upper and lower basins which collectively drain an area of about 575 square miles. The major
Figure 4.1. Basin map, Clear Creek basin
portion of the water supply comes from the mountainous upper basin in the form of surface water runoff from annual snowmen. The lower basin is in a plains area where the water is used for agricultural, municipal, industrial, and recreational purposes.166

**Physical Facilities**

Storage and diversion facilities are located in both the upper and lower basins. Storage facilities in upper Clear Creek supply water for power generation, domestic and agricultural uses in the lower basin. The primary diversions in the upper basin provide municipal and industrial water to the older mountain communities as well as the more recently developed residential and commercial mountain properties.167

In the lower basin there are presently seventeen ditch headgates on Clear Creek, diverting water for agricultural users, municipal suppliers and two major industrial users. The physical facilities also include ditches, canals, augmentation stations, storage reservoirs and pump stations. The reservoirs include Standley Lake and Great Western, Arvada, and Maple Grove Reservoirs. In addition, there is a series of reservoirs located on the south side of Clear Creek which are being formed as gravel is mined (see Figure 4.2).118

**Hydrology of the Basin**

Native flows in the Clear Creek basin averaged 166,000 acre-feet per year from 1912 to 1985. From 1912 to 1930, the average was 190,000 acre-feet, decreasing to an average of 158,000 acre-feet for 1931 to 1985.189

In addition to native flows, Clear Creek basin is supplied by transbasin imports and non-tributary flows. The transbasin imports have been from Jones Pass (Gumlick Tunnel), Berthoud Pass Ditch and Vidler Tunnel while the non-tributary flows have been from the Henderson Mine Tunnel.

Imports through Gumlick Tunnel and flows from the Henderson Mine Tunnel have been significant, generally greater than 2,000 acre-feet per year. Imports through Berthoud Pass Ditch and Vidler Tunnel have normally been less than 700 acre-feet per year.170

**Historical Shift in Basin Water Use**

Clear Creek basin water use has evolved over time to meet the changing needs of adjacent and downstream inhabitants. While there was always a demand for domestic water supply, the proportion of the basin water put to such use has increased dramatically as the lower basin population centers have exploded and traditional patterns of mining and agriculture have been replaced by other means of livelihood.

Mining created the first demand for Clear Creek water in about 1860, although the location of the mining quickly changed. The original demand was for gold sluicing in the lower basin. As gold mining shifted to the upper basin, irrigation water was needed to support the growing settlements in the upper basin. Lower basin mining activities declined significantly after 1862.171

All but three of the water rights in the lower basin were originally decreed for irrigation use.172 Agricultural lands have steadily declined as urban development pressures for land and water have increased. In 1950, irrigated acreage using Clear Creek water was reported by the State Engineer's Office to be 120,000 acres. By 1980, that area had decreased to an estimated 28,000 acres. This indicates a rate of decrease in irrigated acreage of about 3,000 acres per year.173

While this pattern of agricultural decline, if continued, would have resulted in a total loss of agricultural lands by 1990, this outcome will not come to pass. Additional
Figure 4.2. Physical Facilities in Clear Creek basin
sales of land and water for urban development depend on willing sellers. This market has declined in recent years. Some of the lands served by Clear Creek water are removed from land development pressures, and have remained in agricultural production. Additionally, some of the younger farmers in these and other areas served by Clear Creek basin water will likely continue to farm. As a result, the agricultural demand is expected to drop from an estimated 42,000 acre-feet per year in 1987 to an estimated 4,500 acre-feet per year by the year 2035.17

As agricultural use has decreased, municipal use has increased.12 A look at the ownership of three ditch companies using Clear Creek water illustrates this shift to municipal use. Table 4.3 shows the stock ownership distribution for the Lower Clear Creek Ditch Company for 1975 and 1989. The company has about 2,600 irrigated acres in its service area which includes the alluvial plain from just above the confluence of Clear Creek with the South Platte downstream along the west side of the river for about 8 miles. It owns one primary Clear Creek water right with an 1884 priority, for 49.5 cubic feet per second.17

The Farmer's Highline Canal and Reservoir Company's share distribution for the same ten year period presents a good comparison (see Table 4.4). In contrast to Lower Clear Creek Ditch Company, Farmer's Highline has a large service area comprising approximately 23,500 acres, and owns numerous Clear Creek water rights totaling 733.6 cubic feet per second. In 1974, 51.1 percent of the stock was held by municipalities, counties and special districts, while 35.1 percent was held by farmers and small landowners. In 1989, these figures were 79.2 and 11.0 respectively.

The Church Ditch is one of the oldest systems of water irrigation in the state of Colorado. It was originally constructed by a group of farmers in 1863, and is currently owned by the towns of Broomfield and Northglenn. The ditch is about 28 miles long with a service area which exceeds 75,000 acres.19 The Ditch has a capacity of 113 cubic feet per second (cfs) but has been carrying only 80 cfs.

Ownership of the Church Ditch has shifted to become heavily dominated by municipal interests (see Table 4.5). Broomfield alone owns about 39 percent of the total Ditch water. Westminster is the next largest owner at 14 percent of the total. Municipal owners hold title to approximately 90 percent of the company's water in 1989, compared with about 53 percent in 1979.

**Current Transfer Impediments**

There is still a fair amount of water being transferred in the Clear Creek basin,119 but there are a few factors which may influence future transfer activity. The Welch Ditch's Board of Directors have adopted by-laws which tie the water to land historically irrigated. The ditch is located about two miles west of the City of Golden on the south side of Clear Creek (see Figure 4.2). As a result of the transfer restriction, the water is currently used only by remaining agricultural owners.190

Secondly, there is an agreement among several municipal water users, referred to as the "Cosmic Agreement," which obligates the users to make specific discharges, to store effluent, and to exchange, purchase, lease and sell certain water rights in Clear Creek basin.191

**South Park, Colorado**

Averaging nine thousand feet in altitude, South Park is a broad, flat valley stretching thirty-five miles across and fifty miles long and encompassing 900 square miles. It is located in Park County, Colorado, about 50 miles southwest of Denver and is
bordered by mountains on three sides. Park Range to the north and Mosquita Range to the west boast thirteen and fourteen thousand foot peaks. The mountains to the east do not rise above timberline yet provide a majestic entrance to the Park through Kenosha Pass (see Figure 4.3).

Park County was once widely known for its cattle and irrigated hay. The wild hay and cultivated alfalfa of the area provided both excellent graze and cash crops. The natural grass was described as water grass because it required irrigation from spring runoff until almost harvest time. The grass was nutritious fodder, and was shipped as far away as England to be used in the stables as feed for race horses. What was not shipped out of the county was used to feed the abundant cattle, horse and sheep population. In 1883, there were 40,000 head of cattle, 5,000 horses and 10,000 sheep in the South Park area.

Agricultural water use in South Park was directly tied to the acreage of irrigated pasture and hay. Since 1969, irrigated acreage has decreased dramatically as more and more water rights are transferred to front range cities for municipal use, leaving behind thousands of acres to be dried-up. In 1969, there were over 35,000 acres of irrigated pasture and hay. By 1982, this figure had dropped to 20,000. Today, there are less than 4,000 acres being irrigated.

Denver was the first city to purchase South Park water, completing the majority of its transfers prior to 1940 (see Table 4.6). These earlier transfers are diverted downstream at Waterton Canyon. Two later transfers totaling about 2200 acre-feet per year are diverted and stored in Eleven Mile Reservoir (see Figure 4.3).

Aurora began acquiring South Park water in 1968, and has applications pending today. The city has purchased the water rights to approximately 13 ranches, including at least two in conjunction with Thornton. Most of Aurora’s South Park water rights are located above Spinney Mountain Reservoir, which was built in 1972. The transferred water is diverted and stored in the reservoir.

Thornton is the relative newcomer to the South Park water transfer scene, and has purchased much smaller quantities of water than Denver and Aurora. In addition to the seven transfers completed over the past ten years, the city has an interest in at least two pending transfer applications. Thornton uses some storage in Spinney Mountain Reservoir to meet its return flow obligations. However, the transferred quantities of water are left in Tarryall Creek and diverted downstream on the South Platte River. There is no storage for later use. Currently, Aurora leases all of Thornton’s South Park water.

Between 1932 and 1988, about 21 ranches were sold to municipalities, retiring over 35,000 acres of irrigated land. In wet years, as much as 40,000 acre-feet of water could be moved out of the valley to serve municipal needs in Front Range cities. This figure would be much lower in dry years, when more junior rights would be called out. In addition to the decreed transfers, there are at least five completed sales, four of which are at some stage of court transfer proceeding. These sales involve over 4,000 acres of land and over 200 cubic feet per second of originally decreed water rights.

There are a few remaining South Park ranches, and sales are likely to continue. At least one ranch is currently on the market and about eight others remain in private ownership for the present time. In all, they comprise about 6,400 irrigated acres and account for about 190 cfs of originally decreed water rights.
Figure 4.3. Map of South Park, in Park County, Colorado
TABLE 4.3 Lower Clear Creek Ditch Company Stock Ownership, 1974 and 1989

<table>
<thead>
<tr>
<th>Stockholder</th>
<th>Number of shares owned</th>
<th>Percent stock</th>
<th>Number of shares owned</th>
<th>Percent stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers and ditch companies</td>
<td>290.6</td>
<td>77.5</td>
<td>196.6568</td>
<td>52.4</td>
</tr>
<tr>
<td>Thornton</td>
<td>54.4</td>
<td>14.5</td>
<td>135.7289</td>
<td>36.2</td>
</tr>
<tr>
<td>Westminster</td>
<td>0</td>
<td>0</td>
<td>3.7143</td>
<td>1.0</td>
</tr>
<tr>
<td>Adams County</td>
<td>16.0</td>
<td>4.3</td>
<td>16.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Commercial</td>
<td>14.0</td>
<td>3.7</td>
<td>22.9</td>
<td>6.1</td>
</tr>
<tr>
<td>Total</td>
<td>375.0</td>
<td>100.0</td>
<td>375.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>


TABLE 4.4 Stock Distribution for Farmer's Highline Canal and Reservoir Company, 1974 and 1989

<table>
<thead>
<tr>
<th>Stockholder</th>
<th>Number of shares owned</th>
<th>Percent stock</th>
<th>Number of shares owned</th>
<th>Percent stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers and small landowners</td>
<td>383.73</td>
<td>35.1</td>
<td>120.6134</td>
<td>11.0</td>
</tr>
<tr>
<td>Cities and other gov'ts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thornton</td>
<td>259.34</td>
<td>23.7</td>
<td>222.6786</td>
<td>20.4</td>
</tr>
<tr>
<td>Westminster</td>
<td>230.41</td>
<td>21.1</td>
<td>398.8112</td>
<td>36.5</td>
</tr>
<tr>
<td>Arvada</td>
<td>43.54</td>
<td>4.0</td>
<td>105.0518</td>
<td>9.5</td>
</tr>
<tr>
<td>Northglenn</td>
<td>0</td>
<td>0</td>
<td>3.7125</td>
<td>.3</td>
</tr>
<tr>
<td>County gov't and special districts</td>
<td>25.0</td>
<td>2.3</td>
<td>133.7683</td>
<td>12.3</td>
</tr>
<tr>
<td>Subtotal</td>
<td>558.29</td>
<td>51.1</td>
<td>864.0224</td>
<td>79.2</td>
</tr>
<tr>
<td>Commercial, real estate firms and others</td>
<td>151.58</td>
<td>13.9</td>
<td>106.9775</td>
<td>9.8</td>
</tr>
<tr>
<td>Total</td>
<td>1,093.6</td>
<td>100.0</td>
<td>1,091.6133</td>
<td>100.0</td>
</tr>
</tbody>
</table>


1 The difference in total number of shares is probably due to a mathematical error in the company's records.
TABLE 4.5 Ownership of Church Ditch Water, 1979 and 1989
(in inches, 1 in. = 3 gal. per min.)

<table>
<thead>
<tr>
<th>Owner</th>
<th>1979</th>
<th>% of total (approx.)</th>
<th>1989</th>
<th>% of total (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arvada</td>
<td>21.67</td>
<td>1%</td>
<td>133.92</td>
<td>2%</td>
</tr>
<tr>
<td>Broomfield</td>
<td>3.00</td>
<td>&lt;1%</td>
<td>2,232.251</td>
<td>39%</td>
</tr>
<tr>
<td>Golden</td>
<td>64.50</td>
<td>5%</td>
<td>56.5</td>
<td>1%</td>
</tr>
<tr>
<td>Northglenn</td>
<td>0</td>
<td>0%</td>
<td>422.295</td>
<td>7%</td>
</tr>
<tr>
<td>Thornton(^{102})</td>
<td>245.00</td>
<td>10%</td>
<td>400.00</td>
<td>7%</td>
</tr>
<tr>
<td>Westminster</td>
<td>563.98</td>
<td>24%</td>
<td>772.98</td>
<td>14%</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>898.15</td>
<td>38%</td>
<td>4,017.946</td>
<td>70%</td>
</tr>
<tr>
<td>Partial municipal users:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmers Res. &amp; Irr. Co.</td>
<td>360.295</td>
<td>15%</td>
<td>475.00</td>
<td>8%</td>
</tr>
<tr>
<td>Greenway Pk.</td>
<td>0</td>
<td>0%</td>
<td>59.00</td>
<td>1%</td>
</tr>
<tr>
<td>H.O. Assoc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Total</td>
<td>360.295</td>
<td>15%</td>
<td>534.00</td>
<td>9%</td>
</tr>
<tr>
<td>All other owners</td>
<td>1,077.03458</td>
<td>46%</td>
<td>1,158.69</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>2,335.47958</td>
<td>100%(^{103})</td>
<td>5,710.64</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Data provided by Rosie Yeager, Secretary of Church Ditch.

Work is currently underway to comprehensively investigate and report on the socio-economic impacts related to the South Park water rights transfers. However, an impact that has happened quickly and has already been tied to the transfer activity is the low well water levels experienced by the residents of Hartsel (see Figure 4.3). A 1983 engineering report concluded that having little or no production capacity.\(^{104}\)

The report also concluded that some of the deeper wells may also be affected by the drop in the water level.\(^{105}\)

Some solutions were suggested by this study. The solution identified as the most viable with respect to reliability, performance and permanence was the installation of a municipal water supply and collection system, at an estimated cost of $250,000. There has been no action taken to construct such a system to date.\(^{106}\)

Lower Arkansas Valley, Colorado

The Lower Arkansas Valley is defined here to include the stretch of the Arkansas River basin which runs from the City of
Pueblo east to the Kansas line (see Figure 4.4). The headwaters of the Arkansas River are located in the 14,000 foot peaks of the Sawatch and Mosquito mountain ranges near Leadville, Colorado. The river flows eastward through the foothills of the Rocky Mountains to the high plains of eastern Colorado and on into Kansas. The drainage area of the entire Arkansas River basin is over 25,000 square miles.197

**Hydrology**

Most of the native flow in the Arkansas River originates as snowmelt in the mountainous upper basin. Heavy rainfall in the lower basin contributes substantial quantities of flow for short periods.198 Groundwater is an additional significant source of water, especially along the eastern plains of the basin where irrigation return flow as groundwater is the main source of streamflow.199 Finally, eight tributaries feed into the river below Pueblo to contribute substantially to the water supply downstream. While the total native supply varies widely from year to year depending on the winter snow pack, the average supply from Pueblo to the Kansas line is estimated at 1.2 million acre-feet (see Table 4.7).200 Additionally, imported water from transmountain diversions contributes over 150,000 acre-feet of water to the river basin.201

**Diversion and Storage Systems**

A description of the physical facilities of the lower Arkansas can best be provided in the historical context of water development in the basin. Direct diversions were developed in the mid-1800s to irrigate small parcels of land on the flood plain of the Arkansas or its tributaries. Once this land was taken, more difficult irrigation techniques were required on the terraces above the river. Farmers grouped together and formed irrigation companies to overcome the expense of putting such a system into operation. Most reservoirs were constructed between 1890 and 1910, to store water in excess of direct-flow water rights and flows outside of the irrigation season.202

Transmountain diversions into the Arkansas basin began in the early 1900s and are still being developed today. These systems range in complexity from open ditches that traverse low mountain passes, to complex collection systems of tunnels, conduits, reservoirs and tunnels.203

Finally, groundwater use began, slowly at first, with the digging of wells for domestic and livestock purposes. Windmills were later erected. Large-volume well use began during the 1950s, once all inexpensive sources of surface supplies had been tapped.204

The result of these four phases of water development: direct diversions, water storage, transmountain diversions, and ground water, is a complex network of ditches, canals and reservoirs.

Between the Pueblo Reservoir and John Martin Reservoir, there are several major irrigation conveyances diverting water from the Arkansas River (see Figure 4.5). The Colorado Canal diverts from the north bank about 3 1/2 miles upstream from the Huerfano River, and has two major off-stream storage reservoirs, Lake Henry and Lake Meredith. The Highline Canal diverts both native river flows and water from the Busk-Ivanhoe transmountain diversion. The Rocky Ford Canal diverts from the south bank about midway between the towns of Manzanola and Rocky Ford. The canal’s water rights are very senior and are in priority most of the time. The Fort Lyon Canal diverts water about halfway between the towns of Swink and La Junta, and also receives water from both Horse Creek and Reservoir and Adobe Creek and Reservoir.205
### TABLE 4.7. Estimated Annual Water Supply
Pueblo, Colorado to Colorado-Kansas State Line

<table>
<thead>
<tr>
<th>Water Supply:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Streamflow at Pueblo (77-year average)</td>
<td>514,000</td>
</tr>
<tr>
<td>Tributary Inflow</td>
<td>320,000</td>
</tr>
<tr>
<td>Precipitation</td>
<td>300,000</td>
</tr>
<tr>
<td>Groundwater Inflow</td>
<td>55,000</td>
</tr>
<tr>
<td>Total supply (rounded)</td>
<td>1,200,000</td>
</tr>
</tbody>
</table>


### TABLE 4.8. Major Lower Arkansas Valley Water Transfers, 1950-1986

<table>
<thead>
<tr>
<th>Date</th>
<th>Transferred From</th>
<th>Transferred To</th>
<th>Amount Transferred (acre-feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>Las Animas Town Ditch</td>
<td>Pueblo West Metro Dist.</td>
<td>10,000</td>
</tr>
<tr>
<td>1971</td>
<td>Highline (Busk-Ivanhoe)</td>
<td>City of Pueblo</td>
<td>2,600</td>
</tr>
<tr>
<td>1972</td>
<td>Booth-Orchard Grove</td>
<td>City of Pueblo</td>
<td>9,000</td>
</tr>
<tr>
<td>1972</td>
<td>Hobson Ditch</td>
<td>City of Pueblo</td>
<td>1,488</td>
</tr>
<tr>
<td>1974</td>
<td>Colo. Canal (Twin Lakes)</td>
<td>Cities of Pueblo, Colo.</td>
<td>57,000</td>
</tr>
<tr>
<td>1974</td>
<td></td>
<td>Springs, Aurora</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>Las Animas Consol. Ext.</td>
<td>Public Service Co. (not used)</td>
<td>10,186</td>
</tr>
<tr>
<td>1985</td>
<td>Colorado Canal</td>
<td>City of Colo. Springs</td>
<td>43,180</td>
</tr>
<tr>
<td>1986</td>
<td>Rocky Ford (58%)</td>
<td>Aurora</td>
<td>9,270</td>
</tr>
<tr>
<td>1986</td>
<td>Highline (Busk-Ivanhoe)</td>
<td>Aurora</td>
<td>2,250</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>144,974</td>
</tr>
</tbody>
</table>

Source: Paper by Professor Charles Howe, entitled "Effects of Transferring Agricultural Water to Non-Agricultural Uses in the Arkansas Valley of Colorado," presented at a Water Marketing conference Oct. 6 and 7, 1988 at University of Denver College of Law.

Between John Martin Reservoir and the Kansas State line, in Water District 67, there are many more ditches, canals and reservoirs (see Figure 4.6). All of these systems participate in the Arkansas River Compact, and all store winter and excess streamflows in John Martin Reservoir for later use.223

### Historical Water Use

Historically, the Arkansas River Valley was predominantly grazed by livestock from the Kansas border to the headwaters in the mountains. The discovery of gold in Colorado in 1858 and the resulting Pike’s Peak gold rush, led to the first permanent settlements in Colorado. Many prospectors
<table>
<thead>
<tr>
<th>Date of Decree</th>
<th>Purchaser</th>
<th>Ranch or Ditch</th>
<th>Annual Volume Transferred (in acre-feet)</th>
<th>Priority</th>
<th>Acres Dried-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-28-1932</td>
<td>Denver</td>
<td>Weed, Little Channel, Island</td>
<td>3,699.45</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>4-13-1933</td>
<td>Denver</td>
<td>Borden</td>
<td>2,035.50</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>5-23-1933</td>
<td>Denver</td>
<td>Weed, Love &amp; Rayne</td>
<td>940.66</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>11-27-1968</td>
<td>Aurora</td>
<td>Augustine</td>
<td>2,279.98</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>7-14-1976</td>
<td>Denver</td>
<td>Beery</td>
<td>1,600.0</td>
<td>2,000 (approx.)</td>
<td></td>
</tr>
<tr>
<td>2-2-1978</td>
<td>Aurora</td>
<td>Janitell</td>
<td>not final</td>
<td>5,082.0</td>
<td>1,449.3</td>
</tr>
<tr>
<td>1-16-1979</td>
<td>Thornton</td>
<td>McDowell</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-21-1979</td>
<td>Aurora</td>
<td>High Creek</td>
<td>2,932.46</td>
<td>1,624</td>
<td></td>
</tr>
<tr>
<td>11-12-1982</td>
<td>Denver</td>
<td>Four Mile No. 9</td>
<td>598.0</td>
<td>725</td>
<td></td>
</tr>
<tr>
<td>8-26-1983</td>
<td>Aurora</td>
<td>Badger Basin</td>
<td>2,349.0</td>
<td>2,456</td>
<td></td>
</tr>
<tr>
<td>8-26-1983</td>
<td>Aurora</td>
<td>Eleven Nile</td>
<td>14,438.62</td>
<td>9,410</td>
<td></td>
</tr>
<tr>
<td>8-26-1983</td>
<td>Aurora</td>
<td>Coll</td>
<td>2,193.0</td>
<td>1,298</td>
<td></td>
</tr>
<tr>
<td>8-26-1983</td>
<td>Aurora</td>
<td>Walker</td>
<td>1,335.0</td>
<td>968</td>
<td></td>
</tr>
<tr>
<td>3-20-1985</td>
<td>Aurora</td>
<td>Trout Creek</td>
<td>2,855.0</td>
<td>2,600</td>
<td></td>
</tr>
<tr>
<td>3-20-1985</td>
<td>Aurora</td>
<td>Platte-Ansley</td>
<td>1,857.0</td>
<td>2,500 (approx.)</td>
<td></td>
</tr>
<tr>
<td>12-1-1986</td>
<td>Thornton</td>
<td>McKelvy</td>
<td>1,246.0</td>
<td>775</td>
<td></td>
</tr>
<tr>
<td>6-25-1987</td>
<td>Thornton</td>
<td>Rocker 7</td>
<td>206</td>
<td>311</td>
<td></td>
</tr>
<tr>
<td>7-23-1987</td>
<td>Thornton</td>
<td>Sibley</td>
<td>827</td>
<td>780</td>
<td></td>
</tr>
<tr>
<td>10-1-1987</td>
<td>Thornton</td>
<td>Schattlinger</td>
<td>658 +</td>
<td>660</td>
<td></td>
</tr>
<tr>
<td>4-29-1988</td>
<td>Thornton</td>
<td>Teter</td>
<td>560</td>
<td>820</td>
<td></td>
</tr>
<tr>
<td>4-29-1988</td>
<td>Thornton</td>
<td>Dixon-Johnson</td>
<td>560</td>
<td>685</td>
<td></td>
</tr>
<tr>
<td>8-10-1988</td>
<td>Aurora</td>
<td>Indian Mtn.</td>
<td>350</td>
<td>511</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL: >40,030.21  >35,154.8

1 Figure represents maximum volume which could be diverted if right was never called out for more senior rights, and assuming less than 100% reduction of irrigation. In most years, rights dated as late as 1871 are called for at least a few days, per telephone conversation with Mark Curry, Water Commissioner, District 23, on Nov. 3, 1989.

2 Some of this acreage may have continued to receive irrigation water after the transfer decree date.

3 Aurora purchased these water rights from Belona Corp. in the Fall of 1989, after the transfer decree was final.
Figure 4.4. Arkansas River basin, Colorado
Figure 4.5. Diagrammatic sketch of irrigation-ditch systems along the lower Arkansas River, from Pueblo Reservoir to John Martin Reservoir

Figure 4.6. Diagrammatic sketch of irrigation-ditch systems along the lower Arkansas River, from the John Martin Reservoir to the Kansas state line.

who failed in their search for gold took up farming in the Arkansas Valley. It wasn’t until 1874, however, that large-scale irrigation began in the area of Rocky Ford.

Through the years, the area of land irrigated in the Arkansas Valley has remained relatively stable at 415,000 acres. While agricultural use has been the greatest consumptive use of water, historic water use was not limited to irrigation. Since the earliest settlements, cities and industries have accounted for a portion of the water in the basin. Colorado Springs, Pueblo, Trinidad, Walsenburg and Lamar all have historically obtained their supplies through direct diversions or tributary ground water wells. CF & I Steel Corporation annually diverts between 80,000 and 110,000 acre-feet of Arkansas River water for use in their Pueblo plant. Sugar beet factories accounted for some river water use until closing their doors in the 1960s.

**Historical Transfer Activity**

Water transfers in the Lower Arkansas began in the 1950s. During a decade of severe drought and dust storms, many of the ditches and canals with more junior appropriation dates received little or no water. The prolonged drought had a devastating impact on the local economy, closing the sugar beet factory and driving many farmers out of the area. At the same time, several Colorado front range cities initiated efforts to purchase Arkansas Valley water.

After the initial sales in the 1950s to the City of Pueblo, another decade passed before additional sales were completed. This may be due in part to a short-lived improvement in the local economy in the early 1960s. However, since the sugar beet factory permanently closed its doors in 1967, sales of water rights have been steady and continue today.

Aside from Pueblo, other major purchasers of Lower Arkansas Valley water include Pueblo West Metropolitan District, Colorado Springs, Aurora, and Public Service Company (see Table 4).

**Rocky Ford Transfers**

The Rocky Ford Ditch was originally owned and operated by the Rocky Ford Ditch Company. The Ditch historically diverted water from the Lower Arkansas River and delivered the water to farmlands in the area.

The company has two Arkansas River water rights which provide average annual diversions of 46,380 acre-feet. Individual water users hold their rights as shares of stock in the company. There is a total of 800 shares, with each share representing an average of almost 58 acre-feet annually.

In 1983 Aurora purchased 233.24 shares, or about 29 percent of the total rights in the ditch. Additionally, the city took options on additional rights held by the same seller plus rights held by other shareholders in the ditch. The major seller was RIG Investment Group, Limited (RIG), a Canadian investment group that in 1981 purchased all assets of the American Crystal Sugar Company, a large stockholder in the Rocky Ford Ditch Company.

The transfer application requested a change in the point of diversion from the Rocky Ford Ditch to the Pueblo Dam and Reservoir, the north and south side diversion intake points of the City of Pueblo’s water work, and the Fountain Valley Pipeline intake. The applicants also sought a change of use to add municipal, domestic and industrial uses to irrigation.

Aurora’s plan for this water is to exchange the water upstream to Twin Lakes...
or Turquoise reservoirs on the Upper Arkansas River. There the water will be pumped over Trout Creek Pass to Spinney Mountain Reservoir in the South Platte basin.\textsuperscript{114}

The transfer application was granted with certain modifications, and conditions were imposed to protect other water users, including farmers who wished to remain in agriculture. The city must maintain river inflow into Lake Pueblo at a specified rate to protect the carrying capability of the river below the reservoir. Also, 1,000 acre-feet of winter storage water must be released into the lake for use by the farmers in the spring.\textsuperscript{213} Limits were set on the rate of flow and total annual diversion.\textsuperscript{114} Additionally, the court imposed a continuing call at the Rocky Ford Ditch between March 15 and November 1 at specified rates, to help maintain the ditch flow. Part of this amount must be left in the ditch to compensate for incremental seepage losses.\textsuperscript{217}

A unique condition is the treatment of dewatered lands. Before lands may be dried-up, a ground cover must be established which will not require irrigation in order to mitigate the dust bowl effect caused by removing the lands from irrigation.\textsuperscript{215} Responsibility for developing the revegetation program was placed on the sellers, primarily RIG. To date, the program has not resulted in the consistent establishment of a successful ground cover. Also, it is not certain that the successful plantings will survive without irrigation.\textsuperscript{219} Until this revegetation program gets underway, no water may be transferred.\textsuperscript{217}

\textit{Colorado Canal Transfers}

The Colorado Canal is a mutual irrigation ditch located about 15 miles downstream from Pueblo, near the town of Boone, Colorado. In contrast to Rocky Ford ditch rights which are fairly senior, Colorado Canal water rights are little more than flood rights. Historically, the canal has supplied water to lands along and near the north bank of the Arkansas River that have been used for agricultural production.\textsuperscript{221}

In 1900, the canal's water supply became more certain with the completion of the Twin Lakes Reservoir on Lake Creek, a tributary of the Arkansas River near its headwaters. Between 1935 and 1974, the canal received additional water from Western Slope transfers into Twin Lakes through Twin Lakes Division Tunnel. In 1974, however, the canal sold its Twin Lakes water to the City of Colorado Springs, leaving only the rights to the native flow of the river. Eleven years later, the majority stockholder in the ditch entered a contract to sell 28,012.76 shares of Colorado canal stock to Colorado Springs. The seller, Foxley and Company, had acquired lands once owned by the Colorado Land and Development Company.

The Canal's water rights are tied to the ownership of shares of stock. Colorado Canal has 49,133.009 outstanding shares of stock. Each owner of one share of Colorado Canal stock also owns either one share of Lake Meredith or one share of Lake Henry stock, which represent storage rights. There are 49,638.975 acres of land to which interests in the direct flow water rights are appurtenant.\textsuperscript{221}

In the subsequent change of water rights application, Colorado Springs sought to change the type and place of use. The city plans to exchange water from Lake Meredith upstream to Pueblo Reservoir, then exchange the water further upstream to Twin Lakes Reservoir, where it already has facilities in place to transport water to the city.\textsuperscript{225}

Determining historic depletions associated with the water rights proved to be quite a task, due to the complex drainage
pattern associated with historic use of the water. Lands irrigated directly by the canal, or receiving Lake Meredith or Lake Henry storage rights, returned water to a network of sources. Four separate operational studies were required. River depletions on an average annual basis was determined to be 75.5 percent of the historic average annual diversions. As a result, the city received a transferrable right of about 17,500 acre-feet annually.

Conditions were imposed to protect the remaining shareholders of the applicant canal and reservoir companies. All new uses must continue to bear their share of assessments. Non-irrigation uses are subject to a five percent charge which must be left in the lateral where the shares were historically distributed to make up for incremental lateral loss. Stockholders of the Lake Meredith Reservoir Company with a change in use must leave an additional 12 percent of their rights in the reservoir and bear the pro rata evaporation and seepage loss tied to this water.

As with the Rocky Ford application, the Colorado Canal change requires the applicants to undertake a revegetation program requiring no irrigation after its establishment. The goal is to be "not so much...reestablishment of native species but rather of an economically viable dry land forage crop."

Aurora's plan for the Colorado Canal water is basically the same as for the Rocky Ford Ditch water. In the Colorado Canal case, however, the exchange plan is specified in the decree. Water will be exchanged upstream, then pumped over to the South Platte basin.

Local Impacts From Water Transfer Activity

Much work is in progress now to study and develop a comprehensive report on the social and economic consequences of Lower Arkansas Valley water transfer activity. The results of this work should be available in the near future. A more narrow look at consequences of the Rocky Ford Ditch transfer suggests, in general terms, some of the potential effects on the local area.

The drying-up of agricultural lands may impact the local economy. Land values may decrease substantially. County, school and conservancy district taxes may suffer because of their dependence on merchants' sales, real estate values and employment. The removal of water also may lead to the permanent loss of future agricultural economy. If the mandatory revegetation program is not successful, substantial soil erosion may cause local dust storms and increase costs of road, building and equipment maintenance.

Water quality may also be impaired as a result of a reduction of river flows--by reducing the dilution capability of the river. Costs associated with municipal waste clean-up and reduction of salinity levels may be increased. Reduced river flows may also affect the recreational uses of the river.

Section 5: Summary of Findings and Conclusions

This section provides a summary of the findings and conclusions from the Colorado water transfer study. Where possible, comparisons are drawn with the other study states. Several recommendations are then presented for consideration.
Findings and Conclusions

1. Colorado law governing water rights and water transfers is highly developed and somewhat complex. Water rights are regarded as property rights and are transferable in the same manner as other property rights. Changes of water rights including changes in the point of diversion and in the type, place, or time of use may be made so long as other water rights are not injured. Terms and conditions are to be added as necessary to insure no injury to other water rights. To avoid injury, the transfer should result in no net increase in depletion to the stream as a consequence of the change. Colorado law also permits voluntary and involuntary exchanges of water, subject to the requirement that the exchange water is sufficient in quality and quantity to meet the senior appropriator's normal use requirements. Temporary loans or exchanges of water also are authorized.

The physically uniform substance of water has been carved up into many legally distinctive categories in Colorado. These legal distinctions can be quite important in determining the transferability of this water. For example, there are three completely separate legal systems governing groundwater in Colorado: laws related to tributary groundwater, laws related to designated groundwater, and laws related to nontributary groundwater. The rights to use each of these legal categories of groundwater are determined differently, and the rules and procedures governing transfers and changes of these rights also differ.

Imported water—water brought into a basin from another basin—and nontributary groundwater share one very important legal characteristic: since this water is not considered native to the system, it may be used to extinction, reused, or exchanged after use. So long as this water remains in the dominion and control of the user there are no return flow obligations. This legal status makes imported water and nontributary groundwater readily transferable.

Colorado law relating to salvaged water—water previously lost to the stream during beneficial use pursuant to a water right that can be saved and made available for other use—is unclear. The Colorado Supreme Court has denied efforts to gain rights to water not presently being used pursuant to a water right that would be saved by eradicating phreatophytes, removing peat moss, and cutting down pine trees. It has not directly considered the situation in which the water to be salvaged is presently being consumed pursuant to a water right and, through activities such as reduction in evaporation by changes in irrigation techniques and reduction in evapotranspiration through shifts in crop type, water previously lost to the system can be made available without injury to other water users. The right to make new or additional uses of this water should be determinable under a plan for augmentation or change of water right proceeding.

Colorado, like other western states, has authorized a number of different types of special water supply organizations (WSOs) and has given municipalities special water supply authority. WSOs initially were established to supply water for irrigation and rural domestic use. Colorado statutes governing these WSOs vary considerably, and these differences are significant for the transferability of the water rights and the water they control.

Water users in mutual ditch companies hold shares representing some proportional right to the water available under the ditch company's water rights. These shares may be freely traded, subject only to rules established by the ditch company.
members. Irrigation districts are authorized under three different Colorado statutes, and the provisions governing transferability of water vary. Typically, water is allocated by the district according to the number of acres irrigated. The district may sell its water rights, subject to approval of district members. Districts formed under the 1921 Act may lease surplus water for use within or outside the district boundaries.

Conservancy districts are given broad authority under Colorado law and may tax all lands within the district boundaries to carry out district purposes. Originally envisioned as a supplier of irrigation water from projects constructed by the federal Bureau of Reclamation, districts may also supply other water uses within their boundaries. Allocation policies are determined by the districts themselves within the general framework established by the statute authorizing the federal project and the contract between the Bureau and the district and state law. In 1989, Colorado law was amended to allow districts to lease or exchange water for use outside district boundaries. Permanent transfers of water rights outside district boundaries are not authorized, however.

Municipalities are permitted to appropriate water beyond their immediate requirements because of their need to plan for future growth and development. They have also been permitted to lease surplus supplies for use outside their boundaries. Denver has been particularly effective in establishing a water supply system and it supplies water to many users outside the city and county limits. Efforts to subject this water supply activity to public utilities regulation have failed.

Cities in Colorado have been buying agricultural water rights and transferring the water to municipal uses for more than 100 years... As the case studies of Clear Creek, South Park, and the lower Arkansas show, cities continue to use transfers as a means of providing water supplies. The South Park and Arkansas studies also indicate that cities are reaching greater distances to find transferable supplies.

As this summary suggests, Colorado law generally supports water transfers. In particular, it favors permanent transfers of the water rights themselves. It provides a very expansive definition of the changes that may be made in a water right. Changes may only be denied if there is unavoidable injury to other water rights. There are many different legal categories of water, and the categories can have important consequences for the transferability of the rights to this water. The transferability of water rights also is affected by the type of legal entity holding the right. Thus, while the system generally supports transfers of water rights, its highly legalistic orientation makes these transfers potentially more complex.

2. Changes of appropriative water rights involving a change in the use of water are common in Colorado. Excluding changes in point of diversion only, there were 858 applications for changes of water rights filed in the seven Colorado water courts between 1975 and 1984. About 29 percent of these applications were filed in Division One, the South Platte basin. Next most active was Division Five, the Colorado River mainstem, with 17 percent of the applications. During this ten-year period, the highest number of applications was filed in 1982. There was no statistically significant trend in the number of applications during this period.

About 80 percent of the applications were approved. Only 11 applications (about one percent) were denied. About ten percent of these applications were withdrawn, and the remainder were still pending as of
July 1988. The approval rate was about 64 percent in Division One whereas all the applications in Divisions Five and Six were approved.

About 75 percent of the change applications involved a proposed shift of water use from primarily agricultural to primarily non-agricultural uses. About 11 percent of the applications involved shifts of use primarily within the agricultural sector. The single most common purpose for a change of a water right was to support a new use under a plan for augmentation.

Changes typically involve small quantities of water. About half of the approved cases involved either 0.5 cfs or less or 10 acre-feet or less. About 67 percent of the cases involved surface water rights only.

3. The review process for changes of water rights works, but it appears to be contentious and time-consuming. Applications to change a water right are filed with the clerk of the water court for the division in which the water right was established. Statements of opposition may be filed by any party. Generally, the referee rules on the application. Following this ruling, any party may file pleadings with the water judge initiating an entirely new proceeding.

About 60 percent of the applications filed during the ten-year study period drew at least one statement of opposition. In Division One, statements of opposition were filed in 84 percent of the cases. By comparison, the rates of opposition in Divisions Four, Six, and Seven were much lower.

The average time for a final action in the cases studied was about 21 months. The average time for those cases that were approved was more than 19 months. The data indicates a very strong correlation between the length of time to decision and whether a statement of opposition was filed.

It is useful to compare change-of-water-right activity in Colorado with other states included in the overall study. New Mexico and Utah will be used here because their water transfer laws are most comparable to those of Colorado.

Looking first at the number of change-of-water-right applications excluding changes only in the point of diversion, New Mexico had 1,135 applications between 1975 and 1984 while Utah appears to have had about 3853. Colorado had 858 during this period.

In New Mexico, 94 percent of the applications were approved. The approval rate in Utah was about 85 percent. In Colorado, the approval rate was 80 percent. Figure 5.1 compares Colorado and New Mexico.

In New Mexico, the average time for approval of the cases filed during this period was about 5.8 months. The average time for approval in Utah was 9 months. The average time for approval in Colorado was 19.5 months. Figure 5.2 shows the average time to decision in the three states for cases that were approved and the cases either denied or withdraw.

Protests were filed in about 6 percent of the New Mexico cases. The protest rate in Utah was about 9 percent. In Colorado, 60 percent of the cases were opposed. See Figure 5.3.

In short, there appears to be less change-of-water-right activity in Colorado than in New Mexico and Utah, the approval rate in Colorado is somewhat lower, the average time to reach approval is considerably longer in Colorado, and the rate of opposition is much higher. These findings
raise important questions about Colorado water law and the transfer review process that will be discussed below.

4. Analysis of a stratified random sample of 21 cases taken from the cases that were approved closely follows the findings from the broader empirical study. Eighteen of the cases involved some change in the purpose of use. In 14 of these cases the original use was for irrigation. New or additional uses typically included domestic, municipal, and industrial purposes. In two cases the change was to "all beneficial uses." Fourteen of the cases involved a changed or additional point of diversion. Nineteen of the cases involved a new or additional place of use. And, in nine cases the time of use was extended. In ten cases the change was part of a plan for augmentation.

Statements of opposition were filed in 14 of the cases. Objections commonly alleged that an enlarged use of water would result from the proposed change or that the applicant had not adequately demonstrated that no injury would result. Cases with opposition took longer to reach a decision than those without opposition. Only one case in the sample went to trial.

In four of the cases, the terms and conditions included some limitation on the new diversion right and in five cases some compensation to the stream was required by abandoning certain direct flow rights. In several cases the diversion rate was qualified by adding a specific volumetric limit. The single most common requirement was to install measuring devices. The period of retained jurisdiction typically was five years.

5. The transaction costs (not including the purchase price of the water right) involved in making a change of a water right appear to vary widely. Analysis of a stratified random sample of nine change-of-water-right cases showed transaction costs ranging from $0.37 per acre-foot to $1,702 per acre-foot. The average transaction cost per acre-foot for all cases was about $380. There appear to be significant economies of scale so that the transactions costs per acre-foot fall rapidly as the quantities of water transferred increase. The presence of opposition raises costs substantially, and opposition is more likely in cases involving larger quantities of water. Those costs are higher than those found in the New Mexico study.

6. Our study of water transfer activity in Clear Creek basin, South Park, and the lower Arkansas basin illustrates the shift in ownership of water rights in these areas from agricultural to urban control. In the case of South Park and the lower Arkansas basin, it also illustrates that cities in Colorado are reaching further away to find transferable sources of water.

Clear Creek is an example of the transition of an area from mining and agriculture to urban and industrial. Irrigated acreage in lower Clear Creek has declined from 120,000 acres in 1950 to about 28,000 acres in 1980. Our examination of stock ownership in three mutual ditch companies drawing water from Clear Creek illustrates the dramatic shift from agricultural to urban control.

South Park is located near the headwaters of the South Platte River. It is a high mountain valley used extensively in the past for grazing cattle and growing irrigated hay. In 1969, there were over 35,000 acres of irrigated lands. Twenty years later, less than 4,000 acres are being irrigated. Between 1932 and 1968 Front Range cities purchased about 21 ranches in South Park, involving over 35,000 acres of irrigated land. In wet years, the water rights purchased with these ranches could produce as much as 40,000 acre-feet of water.
APPROVAL STATUS OF TRANSFERS

COLORADO 1975-1984

A 80.2%

P 8.61%

D 1.28%

W 9.9%

New Mexico 1975-1984

A 94.4%

U 1.86%

D 1.41%

W 2.29%

Figure 5.1.
Figure 5.2. MEAN MONTHS TO DECISION BY FINAL RULING 95% Confidence Intervals 1975-1984

Mean Number of Months to Decision

Final Status

- COLORADO
- NEW MEXICO
- UTAH

Approved Denied/Withdrawn
PERCENT OF ALL CASES OPPOSED (OR PROTESTED) 1975-1984

ALL CASES EXCEPT PENDING

% OF TOTAL APPLICATIONS

COLORADO  NEW MEXICO  UTAH

Figure 5.3.
There are about 20 major ditch systems drawing water from the Arkansas River below Pueblo. Irrigated agriculture is the major water user in this area. Since the decline of the sugar beet industry in the late 1960s, many irrigation rights have been purchased—primarily by the cities of Pueblo and Colorado Springs. The City of Aurora has purchased ditch rights in the lower Arkansas Valley for eventual transfer into the South Platte basin.

Recommendations

Our research has raised a number of questions about Colorado law and procedure relating to water transfers. The following discussion points to several areas where changes in the law should be considered.

1. The Colorado process for reviewing proposed changes of water rights should be changed to provide that all findings of fact are made by the division engineer.

Colorado's water allocation system utilizes a legal proceeding to determine rights and review proposed changes to these rights. The burden of protecting other water rights in the system is placed primarily on water right holders who must file a statement of opposition and participate in the proceeding if they believe their rights may be injured by the proposed change. The parties to the case each present the engineering, hydrologic, and legal evidence supportive of their positions. Based on the record before them, the referee or judge then renders a final decision.

The issues under consideration in a change-of-water-right case are almost completely factual. They involve matters of historical diversions, transport losses, consumptive use, return flows, and other hydrologic and engineering issues. There are legal issues in some of the cases, but the legal concerns commonly are secondary. Most disputes turn on factual disagreements.

Consideration should be given to making the division engineer the finder of fact in water rights cases. Under this approach, the division engineer would review all applications for their factual analysis that no injury will result and would prepare the proposed decree for final review by the water judge. The technical expertise and the detailed knowledge of the hydrologic system among the staff in the division engineer's office would be used to protect the priority system. This expert review and decision-making approach is used in New Mexico and Utah and appears to be expeditious and effective. As indicated previously, transactions costs in New Mexico are lower than in Colorado.

Colorado law now allows the state engineer to enter a water right case like any other water right holder by filing a formal statement of opposition. He may also formally protest a ruling by the referee, causing the case to go before the water judge. By law, the referee is to "consult" with the division engineer or the state engineer (or both). The consulted engineer is to file a written report with the referee concerning the application and any statements of opposition. If the case is "rereferred" to the water judge by the referee, the division engineer is to file a written recommendation with the water judge. The judge may also request a written report from the state engineer.

Water Division Seven, located in the southwest part of the state, utilizes a simplified system in which the water judge also acts as the referee. The judge has the division engineer review all water rights applications. The Division staff make a field inspection and provide a report. In many cases, the division engineer meets informally with the applicant, and perhaps with other concerned parties, to clarify issues. The division engineer then makes his recommendations, including terms and
NUMBER OF APPLICATIONS BY DIVISION AS A PERCENTAGE OF TOTAL
1975-1984

Figure 5.4.
NUMBER OF APPLICATIONS BY DIVISION
AS A FUNCTION OF STATUS
1975-1984

APPLICATION STATUS
☑ Approved ☐ Withdrawn ■ Denied ☑ Pending

DIVISION
1 2 3 4 5 6 7

NUMBER OF APPLICATIONS
300 250 200 150 100 50 0

Figure 5.5.
CHANGES INVOLVING STATEMENTS OF OPPOSITION AS A FUNCTION OF TOTAL APPLICATIONS BY DIVISION

1975-1984

Figure 5.6.
AVERAGE TIME TO FINAL DECISION
BY DIVISION
1975-1984

IN MONTHS

DIVISION

All cases except pending

Figure 5.7.
conditions to prevent injury. If the parties agree, a proposed decree containing these terms and conditions is then presented to the referee/judge for his final decision.

As shown in Figure 5.4, Division Seven is moderately active in changes of water rights. During the ten-year study period, about 14 percent of the change applications in the state were filed in this division. Figure 5.5 shows the application status for the seven divisions. The approval rate in Division Seven during this period was about 91 percent compared to about 80 percent statewide. Figure 5.6 shows the proportion of cases opposed in the various divisions. About 40 percent of the cases in Division Seven are opposed, compared to about 60 percent statewide. In Division Seven, final action is taken in about 71 percent of the cases within 12 months of the filing of the application. Statewide, final action is taken in only 41 percent of the cases within the first year. As shown in Figure 5.7, the average time to decision in Division Seven is about 10.5 months, lowest of all the water divisions. These statistics indicate that the procedure followed in Division Seven may help to reduce opposition and to facilitate decision-making.

Based on the documented efficiencies of the review processes in New Mexico, Utah, and Division Seven in Colorado, we recommend that Colorado consider making the division engineer the resolver of factual disputes involving engineering and hydrologic issues with appeal of these issues possible to the state engineer. As in Division Seven, the proposed decree would be presented to the water judge for review of legal matters and final approval, disapproval, or modification.

2. Colorado law should be broadened to recognize and address the full set of interests implicated in transfers of water rights and water.

At present, Colorado law requires review of change applications only respecting possible injury to other water rights. Litigation concerning water right changes "has been purely a property quarrel between private interests, with the express object of protecting vested water rights." Yet the interests implicated in a water transfer may be considerably broader than matters of water right injury.

For example, water quality effects apparently are considered only in connection with exchanges and plans for augmentation. In these cases, Colorado statutes specifically require that the substituted water be of a quality that will meet the needs of the senior appropriator. Presumably, any proposed change causing unmitigatable water quality injury to other water rights should be denied but there are no reported cases where the injury alleged from a change was based on adverse water quality effects.

Effects on streamflow-related values are protected only if the Colorado Water Conservation Board holds an instream flow water right potentially injured by the proposed change. As of 1988, more than 1,000 instream water rights had been established under Colorado's program, representing protection of flows on more than 7,000 miles of streams and rivers largely located in the mountainous areas of the state. Not only are these rights limited geographically, they are also limited in that they seek to protect only cold-water fisheries. Other flow-based values such as recreation, water quality, and wetlands are not considered at all.

The effects on groundwater may not be adequately considered, especially in changes of water rights involving surface water diversions. When irrigated lands are dried-up, recharge of shallow aquifers in some locations ceases. The loss of this recharge may affect wells drawing water from the aquifer. It may also affect wetland areas dependent on the higher water tables caused by recharge. Colorado law generally
recognizes the interrelated nature of surface and groundwater. It does not yet, however, adequately consider the many implications of this close relationship.

Water transfers, especially from uses in rural areas, also may raise economic, social, and cultural issues. Among the possible effects associated with these transfers are reduction of assessed valuation of the formerly irrigated lands, limited alternative economic uses of the land, soil erosion on the land and growth of weeds that could spread to other lands still in cultivation, and reduction in agricultural activity upon which other businesses in the area depend. While some of these effects may be addressed through negotiation and stipulation between the applicant and opposers, there is no requirement for review of any of these matters.

There are two related issues that require additional consideration. First, what are the interests that should be addressed? And, second, what process or processes should be used? We have already suggested several areas of concern: instream effects related to things like water quality, recreation, and wetlands and land-based effects such as impacts on the local economy. One approach would be to enumerate the matters for review and require that they be considered. A second would simply be to subject the change of water right to a general public interest standard.

Every western state except Colorado provides for some kind of public interest review of proposed new appropriations of water and at least eight states subject water transfers to this kind of review. The factors considered and the process followed vary considerably from state-to-state. While Colorado's review of water appropriations differs from that in other states, there is no constitutional barrier to establishing a requirement that changes of water rights be in conformance with protection of interests beyond the property interests of other water right holders.

Concerning the process, we have suggested that review of matters related to protection of other water rights should be given to the division engineer. Only relatively minor changes in existing procedures would be necessary to establish this process. The more difficult question concerns how to address the broader set of interests we argue should be considered. Several general approaches are possible.

The most obvious approach is to broaden the review process itself. Because of the nature of the issues raised, we believe careful consideration should be given either to establishing a special advisory group to make recommendations to the water judge on public interest issues or to creating a special body with final decision-making authority in such cases. Whichever approach is taken, we believe that only a small number of water right change cases would need to undergo this broader review. Most cases raise only hydrologic concerns that can be readily addressed by the division engineer's office. Therefore, we suggest creation of a bifurcated process under which only those few cases raising broader issues would be subject to more extended review.

We also urge serious consideration of a somewhat different approach that relies on compensation to offset the adverse effects of water transfers. Under this approach, a water transfers mitigation fund could be established. The fund would be supported by charges assessed against all water transfers. Monies from this fund would be used to mitigate impacts of water transfers as they are identified. One attraction of this approach is that it avoids the need for speculative assessments of the possible adverse social and economic effects of a transfer. At the same time it provides a source of funds for needed mitigation. The availability of such a fund may also be important since the effects of
transfers are likely to be more significant cumulatively than individually.

Finally, we suggest consideration of authorizing county review of water transfers under the so-called "1041" process. In a recent decision,11* the Colorado Supreme Court upheld the authority of counties to regulate the land use impacts associated with the development of water supply systems.12 This case involved county regulation of land use activities by the Denver Water Board in connection with water project development on the West Slope. This review authority could be extended to water transfer activities as an alternative to state review of the land use impacts.

Certainly there are many additional options that should be considered. Whatever the approach taken, we believe the fundamental need is to recognize that water transfers implicate a much broader set of interests than the interest of water right holders' in protecting their diversion rights. Presently, the Colorado system provides little opportunity for consideration of these interests. We recommend that the system be modified to allow such consideration.

3. Colorado water law should be clarified to permit transfer of salvaged water.

There is considerable potential in some circumstances to salvage water presently diverted from streams that is consumed or otherwise lost to subsequent use. So long as the water can be saved without injury to other water users, it should be transferable to other uses with the priority of the original diversion. Colorado law now appears to limit such transactions. We believe this law should be clarified to permit the salvage, and additional use, of water presently diverted or withdrawn for a beneficial use so long as there is no net increase in the depletion of the stream or aquifer and other protected interests are not injured.

4. Colorado law regarding temporary transfers should be updated.

The Colorado statute authorizing temporary loans or exchanges of water was enacted in 1899. It gave legal recognition to the practice of informal swaps of water among irrigators, commonly on the same ditch. There is now considerable interest in arranging so-called "dry year options" and other types of leasing arrangements that may go beyond the scope of Colorado's temporary transfer statute.13 Colorado law should be reviewed to ensure that water leasing arrangements are adequately provided for.

A Final Word

The uses of water are changing in Colorado. Historically, most new demands have been met through the development of unappropriated water supplies. As Colorado reaches the acceptable limit of new water development, the option of reallocating some portion of existing water uses to new uses becomes increasingly attractive. Colorado long has allowed essentially unrestricted transfer of the ownership of water rights. Virtually any type of change may be made in a water right so long as other water rights are not injured.

While transfers and changes of water rights occur with frequency in Colorado, our analysis indicates that the approach is highly legalistic and somewhat complex. The approach involves a review process that is markedly slower and more contentious than in other study states. We believe these findings warrant a reconsideration of many aspects of Colorado water law.

Water transfers implicate a broad set of interests, many of which presently are not considered in the transfer process. We believe that means must be found to address these concerns if transfers are to continue to play a role in meeting new water needs in Colorado.


7. Identified as "underground water," the statutory definition is "water in the consolidated alluvial aquifer of sand, gravel, and other sedimentary materials, and all other waters hydraulically connected thereto which can influence the rate or direction of movement of the water in that alluvial aquifer or natural stream." Colo. Rev. Stat. §37-92-103 (11) (1973).

8. The statutory definition is "ground water which in its natural course would not be available to and required for the fulfillment of decreed surface rights, or ground water in areas not adjacent to a continuously flowing natural stream wherein ground water withdrawals have constituted the principal water usage for at least fifteen years preceding the date of the first hearing on the proposed designation of the basin, and which in both cases is within the geographic boundaries of a designated ground water basin." Colo. Rev. Stat. §37-90-103 (6) (1973).


14. Sieber v. Frink, 7 Colo. 148, 154 2 P. 901, 904 (1884). The court also noted that both points of appropriation were upon the same stream; no change was made in the quantity of water diverted, and no one was injured by the removal; the use and the points of application to such use remained the same. Id.


16. Id. at 19, 19 P. at 839 (quoting from Kldd v. Laird, 15 Cal. 161, 179 (1860)). The court went on to state: "The right to change, so limited, includes the point of diversion, and place and character of use." Id.

17. Strickler v. City of Colorado Springs, 16 Colo. 61, 26 P. 313 (1891). This apparently was a case of first impression in the western prior appropriation states.


24. See E. Mead, Irrigation Institutions 149-51 (1903).

25. Id. at 174: "In every instance investigated the real purpose [of the transfer] has been to make money out of excess appropriation. The parties who have acquired surplus rights are unable to use the water themselves, and seek to sell to some one who can."


33. Colo. Rev. Stat. §37-92-302(1)(a) (1973 and Supp. 1988). Information to be provided in the application includes: (1) a description of the water rights to be changed, (2) a map showing the approximate location of use of these rights, and (3) records of actual diversions of each right. The water clerk for each division prepares a "resume" of all applications each month which is published in certain newspapers and mailed to potentially interested parties. Colo. Rev. Stat. §37-92-302(3) (Supp. 1988).


53. See E. Mead, Irrigation Institutions 171-72 (1903).


59. Colo. Rev. Stat. §37-92-302(1)(a) (Supp. 1988): "Any person who desires ... approval of a proposed or existing exchange of water under section 37-80-120 or 37-83-104 ... shall file with the water clerk in quadruplicate a verified application setting forth facts supporting the ruling sought....".


61. Halford, supra note 52 at 1084.

63. An augmentation plan is defined as:

a detailed program to increase the supply of water available for beneficial use in a division or portion thereof by the development of new or alternate means or points of diversion, by a pooling of water resources, by water exchange projects, by providing substitute supplies of water, by the development of new sources of water, or by any other appropriate means.


68. Fort Lyon Canal Co. v. Chew, 33 Colo. 392, 401, 81 P. 37, 40 (1905).


70. Failure to make this affirmative demonstration of no injury produced a harsh result in Bowman v. Virdin, 40 Colo. 247, 90 P. 506 (1907).


72. The volume may not be increased beyond that permitted prior to basin designation.

73. Colo. Rev. Stat. §37-90-112 (1973) requires notice to be published in a newspaper of general circulation in the county or counties where the activities are located.


76. Id. at 370.

77. Id. at 372.


82. Id. at 759-60.

84. Nontributary groundwater is defined as that groundwater, located outside the boundaries of any designated groundwater basins in existence on January 1, 1985, the withdrawal of which will not, within 100 years, deplete the flow of a natural stream at an annual rate greater than one tenth of one percent of the annual rate of withdrawal. Colo. Rev. Stat. §37-90-103(10.5) (Supp. 1988).


88. Replacement requirements vary depending on whether the water is nontributary or in one of the Denver Basin formations. Colo. Rev. Stat. §37-90-137(9)(b) and (c) (Supp. 1988).


90. The statute provides: "Such water, when released from the dominion of the user, becomes a part of the natural surface stream when released, subject to water rights on such stream in the order of their priority, but nothing in this subsection (2) shall affect the rights of the developer or his successors or assigns with respect to such foreign, nontributary, or developed water...." Colo. Rev. Stat. §37-82-106(2) (Supp. 1988).

91. In Water Supply & Storage Co. v. Curtis, 733 P.2d 680 (Colo. 1987), applicants sought the right to maintain control of and reuse native water—that is, water originating in and part of the watershed in which the use was proposed. The court denied this request because there was no demonstrated beneficial use for the reuse water.


103. See, e.g. Wheeler v. Northern Colo. Irrigating Co., 10 Colo. 532, 17 P. 487 (1887) (fee for the water in addition to the carriage charge struck down); White v. Farmers' Highline Canal & Reservoir Co., 22 Colo. 191, 43 P. 1028 (1896) (contract provision allowing users to determine the amount of water to which he is entitled and to take that amount regardless of other users' rights struck down).

104. 150 Colo. 91, 371 P.2d 775 (1962).

105. Id. at 99, 371 P.2d at 779.

106. Id. See also Merrick v. The Fort Lyon Canal Co., 621 P.2d 952 (Colo. 1981).


109. A repayment contract entered into between the district and the Bureau of Reclamation establishes the payment requirements. It may also contain provisions affecting the transferability of water provided by the Bureau project. Cite to discussion in my overview paper.


115. Pub. L. No. 100-585, 102 Stat. 2973 (1988). This act essentially ratified the agreement made by the Ute Mountain Ute Indian Tribe, the Southern Ute Indian Tribe, the State of Colorado, and the United States in 1986 concerning the reserved rights of the tribe. Special provision is made for the repayment of project costs for this water. An appropriation of $49.5 million is authorized to support tribal development.

116. Id. §5(a),(b) and (c). This means that any arrangement to transport such water out of state would be subject to the limitation of Colo. Rev. Stat. §37-81-101 (Supp. 1988).

117. Carrier ditch companies have already been considered in the section on contract water.


120. See Robinson v. Booth-Orchard Grove Ditch Co., 94 Colo. 515, 31 P.2d 487 (1934). It is reasonable for the company to place a greater assessment on the classes of stock with an earlier priority to reflect the benefits that each class of stock receives. This assumes that the earlier the priority, the more frequent the service. Alternatively, priority may be established by contract between the company and the shareholder. See Ferdue v. Ft. Lyon Canal Co., 184 Colo. 219, 223, 519 P.2d 954,956 (1974).


123. See Fort Lyon Canal Co. v. Catlin Canal Co., 642 P.2d 501 (Colo. 1982). Transfer restrictions in the company’s bylaws must be reasonable and not against public policy. Model Land and Irrigation Co. v. Madsen, 87 Colo. 166, 285 P. 1100 (1930). The restriction will be struck down if found to be arbitrary, capricious, and/or unreasonable. See Zoller v. Mall Creek Ditch Co. 31 Colo. Ct. App. 99, 498 P.2d 1169 (1972); Costilla Ditch Co. v. Excelsior Ditch Co., 100 Colo. 433,436, 68 P.2d 448,449 (1937). A company may be found to have waived a transfer restriction by conduct recognizing the transfer. See Grand Valley Irr. Co. v. Lesher, 28 Colo. 273, 65 P. 44 (1901). The stock certificates should have printed on their face the restriction or a notice of availability of restrictions. See Colo. Rev. Stat. §7-4-108 (Repl. 1966).


143. Known as the "Great and Growing Cities Doctrine," this special status was first fully articulated in City & County of Denver v. Sheriff, 105 Colo. 193, 96 P.2d 836 (1939).

144. See, e.g., City of Colorado Springs v. Colorado City, 42 Colo. 75, 94 P. 316 (1908); Bd. of Comm'rs of Larimer County v. City of Fort Collins, 68 Colo. 634, 189 P. 929 (1920).

145. We were unable to make a determination of the type of use in 94 cases, so the statistical base here is 764 cases of which 576 involved a shift from agricultural to non-agricultural water uses.


147. A PROBIT analysis relates the probability that a given case will experience opposition to the characteristics of that case.

148. We arranged our cases by water division and by size of the water right(s) involved. Water rights measured in cfs were divided into those ranging from 0-.5, >.5-5, and >5. Those measured in acre-feet were divided into those 0-10, >10-100, and >100. The sample size was based on the approximate proportion of cases falling into the 42 case matrix (7 divisions by 6 sizes).


151. The Stroh Ranch Development plan consists of 8,109 residential dwelling units, up to 490,200 square feet of commercial space, up to 182,600 feet of office space and up to 359,400 square feet light industrial space. See Stroh Ranch Decree, at 2.

152. See Stroh Ranch Decree, at 20-21.


154. See In re Application for Water Rights of the City of Lafayette, Case No. W-8347-76, Dist. Court, Water Div. No. 1, decided Aug. 28, 1979. The applicant was also required to continue to pay assessments on its shares of stock. Id. at 15.

156. Under Colorado law, there is a presumption of abandonment if the water rights have not been used for ten years. Colo Rev. Stat. §37-92-402(1)(l)(Supp. 1988).

157. See In re Application of North Central Energy Co. and Wyoming Fuel Co., Case No. 83CW131, Dist. Court, Water Div. No. 2, decided Sept. 16, 1985. The court specifically found that 10 of the rights totalling 23.49 cfs had been abandoned. The other rights were rejected for other reasons.

158. See In re Application of Geoffrey H. Edmunds, Case No. W-81CW120, Dist. Court, Water Div. No. 7, decided April 7, 1982. In this case, the decreed amount was not always physically available. When available, the applicant should be able to continue using the non-transferred amount for its originally decreed purpose.

159. See Order dated March 18, 1983, in In re Application For Change of Water Rights of the Town of Silverthorne, Colorado, Case No. 81CW160, Dist. Court, Water Div. No. 5. The case never went to trial as the parties entered a stipulated ruling allowing the transfer of a reduced quantity of water. The court found that the quantity lost to the vegetation was part of the originally decreed amount.


163. See Agreement dated October 7, 1978, by and between the State of Colorado, the Southeastern Water Conservancy District, the City of Aspen and the Board of County Commissioners of Pitkin County, relating to the resolution of basin and region-wide problems resulting from the operation of the Fryingpan - Arkansas Project.

164. There was a companion case involving the Red Mountain Ditch, in which the applicants sought to change the use from agriculture to municipal and instream flow. Both types of use were approved in the decree. See In re Application of City of Aspen and The Colorado Water Conservation Board, Case No. 80CW62, Dist. Court, Water Div. No. 5, Dec. 6, 1985.

165. See Findings of Fact, Conclusions of Law, Judgment and Decree, Case No. 80CW61, Dist. Court, Water Div. No. 5, decided Aug 7, 1985. The conditions ensured that the ditch rights claimed by objectors would be satisfied and that the Board's use or the combination of use by the Board and the City of Aspen would not exceed in time or rate of flow the decreed quantity.


167. Id. at 2-5 to 2-7.

168. Id. at 2-10 to 2-11.

169. Id. at 1-1.

170. See Final Report, at 4-12.


173. Id.

174. This estimate includes park, cemetery, and golf course irrigation needs.

175. Municipalities have acquired more water than is currently needed. Therefore, some of the water that has been purchased by the cities may continue to be used to irrigate lands until needed by the city.


177. The company also owns water rights on Dry Creek, Ralston Creek and Leyden Creek. See Completion Report, at 11.

178. See L. Walther, Colorado Water - Liquid Gold (1988), at 15-17. This service area estimate includes areas susceptible of irrigation from the ditch through Standley Lake and into the bed of Dry Creek Canal or Nivel Canal.

179. For example, Westminster purchased additional shares of the Farmers Highline Canal and Reservoir Company and has filed a change of water right application with the water court.


181. See Agreement dated May 23,1988, between and among the cities of Golden, Thornton and Westminster and Coors Company. Once the Agreement was executed, an exchange application was filed with the water court. The city of Broomfield objected, claiming that the proposed exchanges would injure their water rights.

182. See K.F. Nutt, Gold, Guns, and Grass: South Park and Fairplay, Colorado (1983) at 34. In 1905, from Hartsel alone, one hundred cars of hay were shipped out of South Park on the Colorado Midland Railroad.


184. Id. at 6.

185. Based on data provided by Mark Curry, District 23 Water Commissioner as to ranches not yet sold or transferred from agricultural use.

186. Information on Denver’s South Park water rights was obtained through several telephone conversations with Bill Bates, Denver Water Board, and research at the State Engineer’s office.

187. Information on Aurora’s water rights was provided by Doug Kemper, Manager of Water Resources for the City of Aurora, and from research at the State Engineer’s office.

188. These pending transfers are discussed infra. Thornton purchased Michigan Creek and Wesley Furman Ranches and has a 25% interest in the Collard Ranch.

189. From telephone conversation on November 2, 1989 with Brian Fitzpatrick, with the City of Thornton. Thornton has a conditional storage right to build a reservoir below Tarryall Reservoir, but plans have not yet been finalized for this facility.
190. Court cases are pending in Water Division No. 1 for the Collard Ranch (Case No. 88CW228) and the Black Mountain Ranch (Case No. 84CW010). Cases likely be filed in December 1989 for the Wesley-Furman Ranch and the Michigan Creek Ranch. The Kline Ranch was acquired by Western Water Rights Ltd. and has not yet been resold to a city. Information on pending applications was provided in part by Brian Fitzpatrick, with the City of Thornton.

191. Figures compiled with assistance from Mark Curry, District 23 Water Commissioner, November 1989. The ranch on the market is owned by Ralph Johnson. The other eight which remain in private hands are owned by Albert Wahl, Freda Wahl, Jay C. Green, Walt Steiner, Ione Evans, Alex Ebel, Woody Nelson and John's Estate.

192. Legal title is under the name Mandalay Irrigation Company.

193. Because of rounding, all uses total only 99%.


195. Id.

196. Id. at 2.2. The study suggests that financial assistance may be available through the Farmer's Home Administration, most likely in the form of a loan. There has been some initial contact between the Park County Commissioners and Doug Kemper, Water Resources Manager for the City of Aurora, to try to resolve the Hartsel well water problem.


201. Id. at A-8. This is a conservative estimate based on a 1974-75 figure of 168,733 acre-feet.


203. Id. at 9.

204. Id. at 9-10. Effects of pumping on the Arkansas River became a problem, leading to provisions in the 1969 Water Rights Determination and Administration Act which made tributary ground water subject to the priority system.

205. Id. at 33-34.

206. Id. at 35. The Arkansas River Compact between Colorado and Kansas was entered in 1948. It provides operating criteria for John Martin Reservoir, which was completed in 1943. See Cooperative Study Report, at A-12.

208. P.O. Abbot, at 32. But the seasonal water supply to this area is subject to considerable fluctuation.

209. Id. at 31.

210. Id. at 11-30. Lamar obtains only part of its supply from wells tributary to the Fort Bent Canal.

211. Id. at 41. Less than 20 percent of diverted water is consumed.


216. Id. at 12. The maximum annual diversion is 9,270 acre-feet including the 1,000 AF release requirement.

217. Id. at 13-14. The applicants entered a stipulation with the minority shareholders to leave certain flows (2 CFS to 5 CFS) in the ditch in order to compensate for historical seepage from the ditch.

218. Id. at 15. See also, WATER MARKET UPDATE (Feb. 1987) at p. 9.

219. Aurora is working on obtaining control of the program. Telephone conversation with Doug Kemper, Manager of Water Resources, City of Aurora on Aug. 22, 1989. The Southeastern Colorado Water Conservancy and other parties filed a motion with the water court in Pueblo to show cause for lack of progress on the revegetation program. RIG and Aurora were found in contempt of court and assessed a fine.

220. See Stipulation dated Jan. 31, 1985 In the Decree, at 4-5, which requires that the ground cover be established prior to removing water from any land now irrigated.

221. See In re Application of the Colorado Canal Co. and Foxey & Co. and the City of Colorado Springs, Consolidated Case Nos. 84CW62-64, District Court, Water Div. 2, State of Colorado (Oct. 21, 1985), at 11 (hereinafter Application of Colorado Canal Co.).


223. Application of Colorado Canal Co., at 18 and telephone conversation with Gary Bostrum, Water Resources Division, City of Colorado Springs (Aug. 24 and Nov. 13, 1989). Colorado Springs and Aurora basically have the same plan for utilizing the water as 50-50 partners in the Homestake project. Colorado Springs' water will be diverted into the South Platte and not stored in Spinney Mountain Reservoir.

224. Application of Colorado Canal Co., at 11. This means that of the 44,429 acre-feet of historic average annual diversions associated with the exercise of the subject water rights, 33,548 acre-feet were completely consumed by consumptive use or evaporation.

225. This figure is after subtracting the amount necessary to maintain return flows. The decree appears to treat the change as if it were an out-of-basin transfer, assuming total consumptive use of all transferred...

226. Id. at 16-17. Numerous other conditions were imposed in the decree related to the applicants' existing and proposed exchanges and substitutions of water and water rights.


228. A separate exchange application is currently pending for the Rocky Ford water.


230. Id. at 218-19.

231. Id. at 221.

232. Carlson, Report to Governor John A. Love on Certain Colorado Water Law Problems, 50 Den. L.J. 293, 318 (1973) (hereinafter Carlson). Carlson further notes that "[r]esearch does not disclose one case where changes were restricted or denied in order to accommodate the proprietary interest of the "public" or the "people" in the water." Id.


234. The legal basis for these rights is set forth at Colo. Rev. Stat. §37-92-102(3) (Supp. 1988). See also Shupe, Colorado's Instream Flow Program: Protecting Free-Flowing Streams in a Water Consumptive State, In Instream Flow Protection in the West (MacDonnell, Rice & Shupe eds. 1989). Most rights held by the Board are based on the protection of unappropriated water. In a few instances existing consumptive water rights have been transferred to the Board and changed to instream flow use. For example, in 1988 a mining company conveyed to the Nature Conservancy a conditional water right to 20,000 acre-feet of storage and 800 cfs of direct flows in the Gunnison River. Company Acts to Preserve Rivers in Colorado, N.Y. Times, Apr. 9, 1988, at A1, col. 3. The Nature Conservancy intends to transfer the rights to the Colorado Water Conservation Board to help protect streamflows through the Black Canyon of the Gunnison. Id.


237. Carlson, at 332. Carlson suggests that it would be necessary to carefully spell out the state interests. He analogizes this kind of requirement to the police-power-based limitations placed on the right to change uses of other types of property. Id.

238. City and County of Denver v. Board of County Commissioners of Grand County, 782 P.2d 753 (1989).