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INNOVATIVE TRANSFER AND EXCHANGE PLANS

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COLORADO WATER ISSUES AND OPTIONS:
THE 90'S AND BEYOND
Toward Maximum Beneficial Use
of Colorado's Water Resources

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This paper is intended to provide a framework for the
discussion of various approaches that are being taken to obtain
water supplies through a series of complex transfers and
exchanges. As virtually all transfers and exchanges effectively
involve changes of water rights and plans for augmentation, the
paper will first set forth the legal framework for implementing
such changes and plans. The paper will then analyze two recent
exchange plans which have been undertaken, and then conclude by
briefly examining some of the issues which have emerged as a
result of the proliferation of changes of water rights, plans for
augmentation, transfers, and exchanges.

I. LEGAL FRAMEWORK

The procedures for initiating changes in water rights
and plans for augmentation (including transfers and exchanges)
have been codified under the Water Right Determination and
Administration Act (the "Act"), C.R.S. 37-92-101, et seq (1973
and Supp.). In implementing such changes and plans, courts rely
on "well-established principles of water law." Weibert v. Rothe
Bros, Inc., 618 P.2d 1367, 1370 (1980). Having been incorporated
into the Act, these well-established principles include:

A water right is a property right .... One
of the incidents of a water right is the right
to change the point of diversion or place of
use .... That right is qualified in that
injury must not result from the change .... It
is the burden of the applicant to show in-
jury will not result from a proposed change.
.... If the water judge determines that
injury will result from the proposed change,
the applicant and the person opposed to the
application must be given an opportunity to
propose terms or conditions which would
prevent the injurious effect.
Weibert, supra at 1371.

The Act defines a "change of water right" as a change in the type, place or time of use. It also encompasses a change in the point of diversion, means of diversion, place of storage or virtually any other alteration involving a water right. C.R.S. 37-92-103(5) (1973).

Similar standards govern plans for augmentation. Statutorily, a "plan for augmentation" is defined as a detailed program to increase the supply of water available for beneficial use by the development of new or alternate means of pooling of water resources "by water exchange projects, by providing substitute supplies of water, by development of new sources of water, or by other appropriate means." C.R.S. 37-92-103(9) (1984 Supp.).

C.R.S. 37-92-305(8) (1984 Supp.) specifies that:

A plan for augmentation shall be sufficient to permit the continuation of diversions when curtailment would otherwise be required to meet a valid senior call for water, to the extent that the applicant shall provide replacement water necessary to meet the lawful requirements of a senior diverter at the time and location and to the extent the senior would be deprived of his lawful entitlement by the applicant's diversion.

Moreover, C.R.S. 37-92-305(5) (1973) provides:

In the case of plans for augmentation including exchange, the supplier may take an equivalent amount of water at his point of diversion or storage if such water is available without impairing the rights of others....
An application for a change of a water right or plan for augmentation can only be effected through judicial approval, following statutorily authorized procedures. These procedures are codified in C.R.S. 37-92-302 (1973 and Supp.).

The key to the approval of any change of water right or plan for augmentation, including exchange, is the question of injury. In fact, C.R.S. 37-92-305(3) (1973) mandates approval if such a change or plan does not injuriously affect the owner of or persons entitled to use water under a vested water right or a decreed conditional water right. This section of the Act further provides that if it is determined that the proposed change or plan as presented in the application would cause injurious effect, the referee or water judge shall afford the applicant or any objector an opportunity to propose terms or conditions which would prevent the injury.

The burden of showing an absence of injurious effect is upon the applicant. *Kelly Ranch v. South Eastern Colorado Water Conservancy District*, 550 P.2d 297, 306 (1976). However, once this burden has been met, a party in opposition to a change or plan must come forward to demonstrate some injury. *Ackerman v. City of Walsenburg*, 467 P.2d 267, 270 (1970).

To constitute injury, there must be a substantial or material effect upon another water right from the change of water rights or augmentation plan, *Green v. Chaffee Ditch Co.*, 371 P.2d 775, 783 (1962) (material injury and injuriously affected standard used interchangeably); *City of Colorado Springs v. Yust*, 249 P.2d 151, 153 (1952) (substantial injury standard); *Farmer's
Reservoir and Irrigation Company v. Town of Lafayette, 24 P.2d 756, 758 (1933) (substantial injury standard). Moreover, the injury asserted must be based upon actual impairment demonstrated by evidentiary facts and not by mere potentialities. Brighton Ditch Co. v. City of Englewood, 237 P.2d 116, 120 (1951); Del Norte Irrigation District v. Maria Reservoir Company, 113 P.2d 676, 679 (1941).

Furthermore, once the applicant proposes terms and conditions to avoid injury, an objector has the burden to show injury notwithstanding the proposed terms and conditions. CF&I Steel Corp. v. Rooks, 495 P.2d 1134, 1136 (1972); Monte Vista Canal Co. v. Centennial Irrigating Ditch Co., 139 P. 981 (1913).


As set forth in C.R.S. 37-92-305(5) (1973), the substituted water must be of "a quality or quantity so as to meet the requirements for which the water of the senior appropriator has normally been used...."

From a water quantity standpoint, the Colorado Supreme Court summarized its position in Danielson v. Kerbs Ag., Inc., supra at 372, as follows:

In our view, each of the standards ["material injury" vs. "injuriously affected"] is an alternative expression of the policy that a change in the place of use of a water right may be allowed only when the change will not
cause unreasonable harm to a prior appropriator. We recognize that the facts determinative of the reasonableness of various changes in place of use involving surface water, tributary ground water, and designated ground water systems will differ. We believe, however, that the standard of reasonableness which governs changes in the place of use is the same in all cases.

Similarly, in *A-B Cattle Co. v. U.S.*, supra, the Colorado Supreme Court recognized that only unreasonable deterioration of historic water quality is prohibited by the substitute water statutes. In this regard, Justice Erickson's dissenting opinion in *A-B Cattle Co.* is particularly instructive where he agreed with the majority that only unreasonable changes in water quality are prohibited: "A balancing of interests is required in every case to determine whether the change in quality or condition is within a reasonable range of acceptability for a prior appropriator when related to his beneficial use." *Id.* at 62.

Also, in considering a change of water right or a plan for augmentation, absolute certainty in the supply of replacement water is not required:

Inherent in the hydrological and geological analysis which the plan for augmentation herein is founded is a degree of uncertainty, but the uncertainty is no greater than that inherent in the administration of water rights generally and is not of great significance. *Kelly Ranch, supra* at 308; *Glacier View Meadows, supra* at 296.

Moreover, in applying all of the foregoing principles to a change of water rights or plan for augmentation one must be mindful of the state's policy of maximum utilization of water. *C.R.S. 37-92-102(1)(a) (1984 Supp).*

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It is implicit in these constitutional provisions that, along with vested rights there shall be maximum utilization of the water of the state. As administration of water approaches its second century the curtain is opening upon the new drama of maximum utilization and how constitutionally that doctrine can be integrated into the law of vested rights." (emphasis added)


Finally, C.R.S. 37-92-304(6) (1984 Supp.) requires that any decision of the water judge passing on a change of water right or plan for augmentation include the condition that approval of such change or plan be subject to reconsideration by the water judge on the question of injury to the vested rights of others. The period for reconsideration is to be long enough after the entry of such decision as to preclude or remedy any such injury. In most instances, this is a minimum of three years.

II. CASE STUDIES

Exxon/Colony Augmentation Plan

The large scale development of oil shale, if and when it ultimately does take place, will in all likelihood need vast amounts of water. Predictions are that upwards of 12,000 acre-feet of water will be required annually to support a 50,000 barrel per day plant.

In the case of Exxon's Colony Project, the oil-bearing shale and proposed retort plant are located atop a high mountain plateau in the headwaters of Parachute Creek, a tributary of the Colorado River (see Fig. 1). Given the limited physical supply
of the Parachute Creek headwaters, coupled with the downstream senior demand for this water, planners have been forced to look to the Colorado River for the project's primary source of supply. For the Colony Project, mainstem Colorado River water will be pumped a distance of approximately 14 miles, up a rise of nearly 4000 vertical feet, where it will be used for mining, retorting, and other related industrial uses.

This reliance on Colorado River water created two problems. First, water from the Colorado River would have to be diverted under relatively junior water right (known as the Dow Pipeline) which could be out-of-priority for a number of months in dry and average years. A source of replacement water, therefore, had to be found to augment such out-of-priority diversions. Second, the pumping costs associated with transporting Colorado River water to the required place of use were awesome. It quickly became apparent that every acre-foot that could be diverted or stored in the upper reaches of Parachute Creek, albeit only a limited source of supply, would represent a significant annual savings in terms of pumping costs. Thus, all conceivable ways of exchanging mainstem Parachute Creek and Colorado River water up to the project area were considered.

With regard to the augmentation of the Colorado River diversions, the first step was to quantify the amount of required replacement water. As the proposed uses of water would be one hundred percent consumptive, there was no need to perform the depletion analysis which is typically required in any augmentation plan. In this instance, the only determination was the
extent of out-of-priority diversions. For this a computer model was made of the Colorado River, using a number of conservative assumptions as to the development of senior conditional water rights, strict administration and various compact considerations. In every respect, conservatism was the name of the game as a billion dollar oil shale operation cannot be idled for even the briefest of moments for want of a water supply. When the engineering analysis was completed, it was determined that approximately 6000 acre-feet of augmentation water would be required to provide a dependable year-round source of Colorado River water for the Colony Project. Moreover, since company policy sought to avoid the dry-up of irrigation lands if at all practicable, storage was the key to providing the requisite water supply.

Yet, at the time the Colony augmentation plan was being formulated, there was a significant time constraint. The entire project was to be fully operational within two years. Obviously that meant that there was not enough time to go through all of the environmental hoops to build a new reservoir with a firm yield of 6000 acre-feet. The only alternative was to lease or purchase an existing storage facility which could effect a year-round release to the Colorado River or its tributaries upstream of the Colony mainstem diversion.

A computer printout of all Water Division No. 5 reservoirs in excess of 50 acre-feet in size was prepared and analyzed. Few realistic alternatives were apparent and only one facility satisfied all requirements -- Ruedi Reservoir. Located on the Fryingpan River above the town of Basalt (see Fig. 1),
Ruedi Reservoir is a 103,000 acre-foot federal storage facility built as part of the Fryingpan-Arkansas Project. While its primary purpose was to provide replacement water for project diversions earmarked for southeastern Colorado, Ruedi Reservoir was deliberately oversized to provide a source of water for future municipal and industrial uses (specifically oil shale related) on Colorado's western slope. However, notwithstanding the original intended uses, no long-term contracts had ever been issued by the Bureau of Reclamation (the managing federal agency) for Ruedi Reservoir water during its fifteen years of operation, and it appeared as though significant political and environmental problems might make the secural of such a contract a difficult task. Yet, with its options limited if it wanted to avoid the purchase and storage of agricultural water rights, Exxon decided to tackle the difficulties of securing a long-term service contract for 6000 acre-feet of water from Ruedi Reservoir. The result was that after nearly a year and a half of intense effort (the intricacies of which would be enough for an entirely separate article), Exxon succeeded in obtaining a long-term contract for the necessary Ruedi water. Moreover, it also contracted for an additional 1200 acre-feet to augment out-of-priority depletions generated by Battlement Mesa, the municipal development constructed to house the growth associated with the Colony Project. With these contracts, Exxon had the ability to insulate its mainstem Colorado River diversions from a call through the release of an amount of Ruedi water corresponding to its out-of-priority diversions, plus chargeable transit losses.
An interesting collateral aspect to the use of Ruedi water for augmentation purposes was the calculation of the associated transit losses. Extensive studies performed by Wright Water Engineers demonstrated that the standard ten percent carriage loss assessed by the State Engineer for reservoir releases was excessive. In particular, the study indicated that transit losses dramatically decrease after the first two weeks of a call situation, primarily because of the stabilization of losses caused by bank storage. Accordingly, the augmentation plan decree fixed the transit losses associated with Ruedi Reservoir releases, using a fluctuating formula based on the duration of a call. Specifically, the transit loss was set at 9.5% for the first fourteen days of release after call initiation, and 0.4% for each day thereafter through termination of the augmentation release.

The second major aspect of the Colony augmentation plan was the so-called Cornell Ditch exchange. Exxon is the owner of an undivided one-half interest in and to the Cornell Ditch. This water right is not only the senior most right on Parachute Creek, it is also one of the last or furthest downstream ditches to divert on the creek. The proposal was to change this water right from agricultural to industrial uses, and alternately divert and store this senior right upstream at various onsite wells, creeks and reservoirs. Perhaps the most unique aspect of this change, however, was the fact that Exxon sought to transfer not just the historic consumptive use of its Cornell Ditch rights, but the full amount of the historic diversions of its interest in this
water right (approximately 811 acre-feet/year). Exxon maintained that an exchange of the historic diversions was proper in view of the seniority and downstream positioning of its right. In other words, since the senior Cornell Ditch could have called out upstream junior rights and none of these junior rights benefitted from any Cornell Ditch return flows, a situation existed whereby an amount equal to the historic diversions could be exchanged during certain times of the year. Yet, in order to assure that the operation of this exchange would not result in any injury to other users on the stream, four principle protective terms and conditions were imposed.

As one might expect, the exchange was limited to the historic season of use of the Cornell Ditch rights (April 15 through October 31) at the monthly distribution rates of historic diversions agreed to by the various participating engineers. Moreover, during years that the exchange is being operated, the lands historically irrigated by Exxon's interest in the Cornell Ditch are to be taken out of production.

To account for the fact that the downstream Cornell Ditch may have been historically satisfied by the return flows of upstream junior rights, perhaps the most important aspect of this exchange was the imposition of the so-called "minimum flow" condition. This condition limits the exchange to times when there is a surface flow bypassing the existing points of diversion and storage of upstream water rights which are in priority (see Fig. 2). At times when the surface flow passing any such point of diversion or storage is less than the historic Cornell Ditch
diversions, then the amount that can be exchanged by Exxon is limited to the amount of such surface flow. In other words, the exchange can only be prevented from occurring in some form when an upstream water right is diverting in priority the entire surface flow and is still not receiving its full decreed entitlement. As long as there exists a minimum flow bypassing upstream water rights diverting in priority, all parties agreed that these water rights could not be injured by the exchange. Additional provisions were also incorporated in the decree to define the point of measuring the surface flow bypass where upstream groundwater wells were involved.

The third condition related to the replacement of carriage losses in the Cornell Ditch. To prevent injury to other ditch co-tenants, Exxon agreed to leave in the ditch a portion of its historic Cornell Ditch diversions. This could be accomplished by either restricting the amount of its upstream exchange (see Fig. 2), or by replacing the appropriate ditch loss by injecting into Parachute Creek at or above the Cornell Ditch headgate an equivalent amount of water from its Colorado River rights. Using this latter approach, Exxon can exchange the full amount to its upstream diversion points and significantly limit the distance it would have to pump its Colorado River rights.

The fourth principle condition was designed to prevent injury to downstream Colorado River users. To the extent that the exchange exceeds the historic consumptive use of Exxon's Cornell Ditch rights, then Exxon is obligated to replace to the Colorado River the difference between the amount being exchanged
(up to the historic diversion limitations) and its historic consumptive use credits. However, this condition is only imposed during such times as there is a call on the Colorado River below the mouth of Parachute Creek. At such times, the downstream Colorado River rights would have received the benefit of the historic Cornell Ditch return flows. Consequently, the exchange and subsequent consumption of amounts in excess of the historic Cornell Ditch depletion credits must be replaced to prevent injury to these downstream rights. The decree provides for the replacement of such return flows by the release of Exxon's Ruedi Reservoir water, or by foregoing the diversion of a corresponding amount of its Colorado River rights when in priority. In either event, the replacement via the use of Colorado River water does not restrict the Cornell Ditch exchange, and the goal of limiting pumping costs is achieved.

Overall, there were some twelve original objectors to the Colony augmentation plan, four of whom were particularly active. In the end, all parties stipulated to a consent decree which was approved by the Division No. 5 Water Court in March of 1985. Just over two years elapsed from the time of filing this augmentation plan to the date of entry of a decree.

**Summit County Exchange Plan**

In the midst of the adjudication of the Colony augmentation plan, a far more complex and intricate exchange plan was developing. The plan involved no less than six municipalities and water districts, three major ski areas, the Denver Water Board, the Bureau of Reclamation, the Colorado River Water
Conservation District and the Middle Park Water Conservancy District. Yet, no entity played a more central role than the Board of County Commissioners of Summit County, Colorado, which spearheaded the entire effort.

The impetus for this exchange lay in the additional needs for water within Summit County caused by three factors. Those factors were the significant expansion of snowmaking operations at the Breckenridge, Copper Mountain and Keystone Ski Areas; the ever-expanding populations of the Towns of Breckenridge, Dillon, Frisco and Silverthorne, along with the unincorporated areas in the County; and the development of a number of area golf courses.

Generally, an adequate physical supply is available to satisfy these various water requirements. However, between Denver's Dillon Reservoir/Roberts Tunnel system and Public Service Company's Shoshone Power Plant, the prospects exist for a virtual year-round call in the Blue River basin. Thus, little reliance can be placed on the development of junior water rights to permit diversion of the available physical supplies.

As a result, water users were forced to look to the purchase of senior agricultural water rights or existing storage, such as Green Mountain Reservoir. In addition, for the water districts and towns, there is the 1500 acre-feet of water stored in Granby Reservoir for the benefit of County municipal users as part of the settlement of the Windy Gap water project. However, all of these potential sources of senior water rights are located downstream of Dillon Reservoir, and, with the exception of the
Town of Dillon and Silverthorne municipal water diversions, all of the Summit County requirements are upstream of Dillon Reservoir (see Fig. 3). Therefore, in order to obtain a legal supply of water where needed in the upper reaches of the Blue River basin, an exchange plan had to be fashioned which would take water from the available downstream sources and "jump" it above Denver's Dillon system. The problem is that, absent a subordination agreement from Denver, such an exchange would have limited potential in the spring and summer months when Dillon Reservoir and the Roberts Tunnel direct flow diversions are in priority. Moreover, the exercise of Denver's Williams Fork exchange has the potential of further limiting any Summit County exchange\(^1\) in the fall and early winter. To compound the problem, with the anticipated construction of additional east slope storage, the specter also exists for Denver to expand its Williams Fork exchange through the winter and early spring.

While there are serious questions as to whether the existing or expanded Williams Fork exchange could be used to block an upstream exchange of Green Mountain Reservoir water, that is big ticket litigation that only the water attorneys would relish. Even a complete victory for the west slope interests on this issue would still only solve the winter water requirements. The bottom line was that, without Denver's cooperation, any Summit County exchange would be difficult to accomplish, take years to litigate, and in the end would probably only provide a limited solution.
It was against this backdrop that the Summit County Commissioners began a series of wide-ranging negotiations with the Denver Water Board. With the support and close cooperation of the local ski areas, towns and water districts, the negotiations commenced in October of 1982, and were successfully concluded with the approval of a comprehensive agreement in August of 1985. In addition to water supply matters, this agreement spanned a wide range of issues, such as water quality (direct discharge of County-treated effluent into the Roberts Tunnel to provide relief from phosphorous limits threatening to cap the County's future growth); Dillon Reservoir operations (the maintenance of a full reservoir in the summer season and subordination of the recreation water levels of any future east slope storage facility to Dillon Reservoir); County support for a future Denver east slope storage facility; Denver support for a newly adopted Green Mountain Reservoir operating policy which provides for long-term water service contracts for County users; and more. For purposes of this article, however, only the water right aspects of the agreement will be discussed.

Principally, the Denver/Summit County agreement provides that Denver will subordinate Dillon Reservoir and the Roberts Tunnel, along with the operation of the Williams Fork exchange, to the extent required to permit County users to divert and consume, directly or by exchange, up to 3100 acre-feet per year at any point of diversion or place of storage upstream of
Green Mountain Reservoir. So as to replace the amount of water which would otherwise be lost by Denver as a result of this subordination, the County agreed to four conditions.

First, the users agreed to provide to Denver 0.58 acre-feet of replacement water for each consumptive acre-foot of water used pursuant to the subordination agreement for municipal and irrigation uses, and 0.145 acre-feet for each acre-foot of water diverted for snowmaking uses. Thus, in a year where 2000 acre-feet might be used pursuant to the agreement for snowmaking, and 1100 acre-feet used for municipal purposes, the County users would have to provide 958 acre-feet of replacement water to Denver \([2000 \times 0.45 + 100 \times 0.58]\).

Under the terms of the agreement, this replacement obligation can be satisfied by Green Mountain Reservoir contract water, Windy Gap settlement/Granby Reservoir water, the Clayton Hill Ranch irrigation water rights purchased by the Town of Breckenridge, or any other source subsequently agreed to by Denver and the County users. It should be noted that this replacement water is in addition to the water which may be required to prevent injury to downstream senior water rights, such as the Shoshone Power Plant. For example, in the case where 2000 acre-feet is diverted for snowmaking uses, 2000 acre-feet of water would have to be acquired from Green Mountain Reservoir to prevent injury to the Shoshone Power Plant, while an additional 290 acre-feet \((2000 \times 0.145)\) would have to be secured to prevent injury to Denver as a result of its subordination.
Second, the County users agreed to use only once any water diverted under the Denver subordination, and that no credit will be taken for any snowmaking return flows.

Third, no more than 1750 consumptive acre-feet of the 3100 consumptive acre-feet benefitting from the Denver subordination can be used in any one year for municipal and irrigation purposes, with the remaining balance to be used for snowmaking.

The rationale behind these latter two conditions underscores the importance of the snowmaking return flows to the entire County exchange plan. Snowmaking diversions are made at times when Dillon Reservoir and the Roberts Tunnel are out-of-priority due to the downstream senior call of the Shoshone Power Plant. While a 100% depletion at the time of diversion, approximately 85% of the water diverted and used for snowmaking returns to the stream system during the spring runoff. Denver's Dillon system is in priority during the spring runoff and can capture and divert this water so long as the ski areas claim no credit for the snowmaking return flows. In fact, it is through these return flows that the major source of replacement water is provided to Denver under its agreement with the County. Thus, the reason for the ceiling placed on municipal diversions benefitting from the Denver subordination.

Moreover, the benefits derived from the snowmaking return flows also illustrate another aspect of the County-wide exchange plan. By pledging their return flows as part of an overall agreement, the County ski areas were willingly subsidizing the County municipal users so as to reduce the overall
amount of replacement water required to effect the exchange. In fact, the spirit of cooperation among the County users exhibited through the entire negotiation process was truly noteworthy, and critical to the ultimate success of the process.

Since Denver agreed to subordinate to 3100 consumptive acre-feet, the fourth condition defined the method for determining the consumption of various diversions. For instance, the agreement provided that 5% of all municipal diversions would be consumed where waste water was processed by a central treatment plant, and the figure was set at 10% where a septic/leachfield system was employed. In addition, the consumptive use for irrigation purposes was set at 1.45 acre-feet per irrigated acre, while snowmaking diversions in a given year reduced the remaining amount of water which may be diverted under the Denver subordination in the same year on an acre-foot for acre-foot basis. In other words, snowmaking uses are considered a full depletion at the time of such diversions.

Finally, for the two County towns (Dillon and Silverthorne) which divert below Dillon Reservoir, Denver agreed to make a limited amount of storage space available in the reservoir (a total of 400 acre-feet). This will permit these towns to exchange and store for subsequent release water from Green Mountain and Granby Reservoirs. In return, these towns are required to make available to Denver 1.4 acre-feet of agreed upon replacement water for each acre-foot of water stored and released in Dillon. This is indeed a small price to pay for the most valuable of all water resources in the Blue River basin -- storage!
Given the recent execution of the Denver/Summit County agreement, the County is currently in the process of signing agreements with the local ski areas and municipal suppliers allocating the amount of water which can be diverted by each entity pursuant to the terms of the Denver subordination. This allocation is being made according to pre-agreed upon amounts and will dispose of all but a small unallocated pool which the County will retain for future uses. Most importantly, however, as part of the allocation process, each County user has agreed not to oppose the use of water pursuant to the Denver subordination by the various other County users. In that manner, downstream County users will be prevented from opposing the exchange plans of upstream users, thereby eliminating another significant source of potential litigation. This is perhaps one of the most significant aspects of the entire plan and further demonstrates the spirit of cooperation among the County users.

With the approval of the Denver/Summit County agreement and the various County allocation agreements, a significant step was taken toward the resolution of the County's long-term water requirements. Based on the principles negotiated in this process, the Town of Breckenridge has already successfully adjudicated its exchange plan utilizing the 700 consumptive acre-feet of agricultural water rights located in the Lower Blue purchased as part of the Clayton Hill Ranch. Moreover, a number of municipal entities with access to Windy Gap/Granby Reservoir water have pending exchange plans based on the Denver/Summit County agreement. However, those ski areas and other entities
principally relying upon Green Mountain Reservoir as a source of augmentation and replacement water have one more hurdle to overcome. Long-term water service contracts for such water must still be secured, which, in turn, is dependent upon the completion of an environmental impact statement,\(^3\) and the successful resolution of some complex minimum streamflow and endangered species issues. All one can say for certain is that this entire process has had enough twists and turns and potential pitfalls to satisfy even the most hardcore water attorneys. But then again, no one said it would be easy, and where so much water is at stake, it rarely is.

III. EMERGING ISSUES

Water Quality

As water resources have become more scarce, particularly in the urban areas of Colorado's eastern slope, the indirect reuse of municipal effluent has become commonplace. Upstream municipalities divert their water requirements from area streams, and then discharge the sewage return flows back into the stream after treatment. Downstream municipal and agricultural users then divert and use the stream water which, in part, is comprised of the treated municipal effluent.

As the upstream municipalities grow and require additional water supplies, augmentation and exchange plans involving the municipal effluent have become widespread. In most instances, the municipal effluent is used as a credit for purposes of determining the amount of augmentation water which must be replaced to the stream to permit out-of-priority diversions
under a junior water right. For example, if the municipality diverts 1000 acre-feet of water under an out-of-priority junior right, returns 900 acre-feet to the stream as treated effluent, then 100 acre-feet of replacement water must be furnished to the stream to augment the out-of-priority depletion. In other situations, the sewage return flow might be pumped to another diverter's headgate or exchanged upstream to provide additional supplies of water. Moreover, in situations involving the use of nontributary or imported water, the resulting municipal effluent may be exchanged to provide for the reuse and successive use of such nontributary or imported water.

Central to this entire process has been the state's Water Quality Control Act of 1981. Under the Act, all of the streams of the state have been classified according to the past, present and desired future uses made of their waters. The four major categories of classified uses are aquatic, drinking water, irrigation and recreation, and a given stream or segment thereof can be designated as all or any combination of such use categories. In addition, water quality standards have been adopted by the state, which are numeric limits of all pertinent pollutants that need to be regulated to protect the classified uses of streams.

Together, the stream classification and standards setting procedure took over seven years to complete, and is implemented through the state discharge permit system. Pursuant to C.R.S. 25-8-501, before one can discharge any pollutant into a stream, a permit must be obtained from the Water Quality Control
Division, the agency of the state Department of Health which has responsibility for administering the Water Quality Control Act. In essence, the discharge permit is the method by which the water quality standards (and any other required conditions) are applied to a given point source, thereby protecting the uses for which a stream is classified. In other words, if a given stream is classified as a drinking water supply, then the permit for a point source (e.g., a municipal wastewater treatment plant) discharging into such stream would set forth discharge limitations and detailed treatment, monitoring, and reporting requirements to ensure that, with conventional treatment by any downstream diverter, the stream water will meet federal safe drinking water standards. Moreover, the permits are subject to ongoing review and evaluation to ensure that the standards and performance are adequate to protect downstream uses. This also provides a mechanism to incorporate new information and technologies into the regulatory process. Finally, the Division is granted broad enforcement powers to ensure compliance with all permit terms.5

Given this regulatory framework, water quality was never seriously raised or considered as an issue in the context of a municipal augmentation plan. If the municipal user was discharging its effluent into a stream under a valid permit, then credit was given for such return flows. Typically, when municipal sewage is processed through a central wastewater treatment
plant, it is assumed that approximately 5% of the in-house domestic diversions are consumed, with 95% returning to the stream system.

However, with the recent decision of the District Court in and for Water Division No. 1 involving the augmentation plan of the City of Golden (Case No. 83CW361), the ability to obtain credit for municipal return flows has been placed in doubt. In that case, Golden sought approval of a plan to augment out-of-priority depletions from a junior water right in Clear Creek. The proposed sources of augmentation water were various nontributary, transmountain diversion and senior direct flow irrigation rights. As is the case with virtually all augmentation plans, Golden proposed to replace only the net amount of stream depletions caused by its out-of-priority diversions, rather than the total amount of its gross diversions. In determining the net stream depletions requiring augmentation, Golden sought credit for the amount of water returned to Clear Creek from its wastewater treatment plant. Prior to trial it was stipulated by all parties that the return flows discharged by that plant are fully authorized by a valid permit issued by the Water Quality Control Division.

The plan was principally opposed by three downstream municipal and agricultural users on the grounds that the municipal effluent returned to Clear Creek was part of the substituted water supply and was not of acceptable quality "so as to meet the requirements for which the water of the senior appropriator has normally been used...." C.R.S. 37-92-305(5) (1973). Citing
C.R.S. 25-8-104 (1973), the objectors argued that the Water Court could make its own determination regarding the suitability of the quality of the municipal return flows, and that it was not bound by the findings of the Water Quality Control Division; namely, that the treated Golden effluent was in compliance with all water quality standards, and that the permit issued for the Golden treatment plant protected the classified uses of Clear Creek. In the instant case, the relevant segment of Clear Creek is classified to protect aquatic, drinking water, agricultural and recreation uses.

After four weeks of testimony, much of it centered on the complex scientific issues associated with the quality of municipal effluent, the Water Court denied Golden credit for any of its in-house municipal return flows. In announcing its oral ruling, the Court accepted the objectors' argument that there was allegedly increased risk associated with exposing downstream municipal and agricultural users to treated effluent. While admittedly that risk could not be quantified and was speculative, since the applicant could not prove the absence of injury, the requisite burden of proof was not met. The Court went on to state that it would closely scrutinize all future applications involving claimed credit for or the exchange of municipal effluent, and expressed doubt that the burden of proof could be met by any applicant with respect to the relative safety of treated municipal effluent.
This case is under appeal and until resolved presents a serious threat to the numerous pending augmentation and exchange plans involving the reuse of municipal effluent. Moreover, western slope and environmental interests who oppose additional transmountain diversions are also concerned lest the need to replace 100% of all diversions might force the development of additional transmountain water projects. With the very essence of the maximum utilization doctrine at stake, the only sure bet is that the litigation surrounding the water quality issues raised by this case has only just begun.

**Water Storage Rights**

In an ever increasing number of augmentation and exchange plans, the storage of water is playing a central role. It has become the principle means of providing a year-round water supply where only an intermittent source or seasonal use formerly existed. Yet, while a reservoir can solve a number of problems, it can also raise a number of interesting collateral issues. One such issue discussed in connection with the Exxon/Colony augmentation plan is the extent and timing of transit losses associated with reservoir releases. Far too many plans go through a painstaking analysis of precisely defining the amount of out-of-priority depletions, only to then leave a considerable amount of water "on the table" by just agreeing to whatever transit losses the State Engineer might subsequently impose.

Second, where a junior reservoir right is used to augment out-of-priority depletions, it is not uncommon to face the prospect of having to replace reservoir evaporation losses
which are many times greater than the municipal depletion which created the need for storage in the first place. A case in point was a situation where an existing 75 acre-foot reservoir tributary to the Big Thompson River was used to augment a 1.25 acre-foot depletion resulting from a residential development. While the reservoir had been built in 1915, it was not adjudicated until 1980. As a result, the State Engineer initially argued that evaporation losses of over 20 acre-feet per year had to be replaced in addition to the minor depletion caused by the proposed development. Moreover, as the State Engineer requires carry-over storage of between 3 to 5 years where the source of augmentation water is a junior reservoir right, virtually the entire 75 acre-foot facility was needed to augment an initial depletion of just over 1 acre-foot. Try explaining that one to a developer who had designs on someday enlarging his project and was certain that his reservoir was big enough to accommodate any reasonable expansion.

Lest, however, you fear that all forays with the State Engineer's office have an unhappy ending, it was subsequently established that 80% of the reservoir had been a natural lake. Since the evaporation losses off of the natural lake had been an historic depletion to the river system, the State Engineer ultimately stipulated to a decree which provided that the natural losses did not have to be replaced. While such a decree might appear to be inconsistent with the Shelton Farms and RJA decisions, the primary difference lies in the fact that no consumptive use credit was being claimed as a result of the eradi-
cation of phreatophytes or the dry-up of wetlands. Rather, the applicant was merely seeking to avoid having to replace a loss which predated the most senior water right in the basin.

A third potential problem associated with storage rights stems from the fact that most reservoirs leak. This is particularly true where old gravel pits are converted into storage facilities. Where the source of water for a leaky reservoir is nontributary or foreign water, you may have the ingredients for a dominion and control argument.

C.R.S. 37-82-106(2) (1984 Supp.) provides that:

To the extent that there exists a right to make a succession of uses of foreign, nontributary, or other developed water, such right is personal to the developer or his successors, lessees, contractees, or assigns. Such water, when released from the dominion of the user, becomes a part of the natural surface stream where 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 nor shall dominion over such water be lost to the owner or user thereof by reason of use of a natural water course in the process of carrying such water to the place of its use or successive use. (emphasis added).

Based on this statute, the argument has been made that the nontributary or foreign water which "leaks" from a reservoir has been released from the dominion of the user, and becomes part of the natural stream. However, C.R.S. 37-82-106(2) was adopted by the legislature's response to the massive filings by John Huston which sought credit for the return flows of thousands of nontributary wells in which Huston had no interest. The statute
was simply designed to limit to one developing the water the right to reuse, and to prevent unrelated third parties from claiming credit therefor.

While this fact alone should be enough to defeat the application of the dominion and control argument to reservoir seepage, there is perhaps a more practical way of disposing of this potential pitfall. In drafting an augmentation plan where reservoir seepage may occur, one can simply fashion the seepage to be a source of replacement water under a mini-augmentation plan.

C.R.S. 37-92-305(8) (1984 Supp.) provides that:

... a plan for augmentation shall be sufficient to permit the continuation of diversions when curtailment would otherwise be required to meet a valid senior call for water, to the extent that the applicant shall provide replacement water necessary to meet the lawful requirements of a senior diverter at the time and location and to the extent the senior would be deprived of his lawful entitlement by the applicant's diversion.

Under the proposed mini-augmentation plan, one is simply seeking to store out-of-priority water in a reservoir to the extent that replacement water in the form of nontributary, out-of-basin or in-priority stored water is returned to the stream by seepage. The end result is that the stream is no better or no worse off than before -- exactly the purpose of an augmentation plan. No injury will be suffered by any party because stream conditions will remain entirely unchanged. In fact, not allowing such replacement diversions would result in a windfall to downstream appropriators of large quantities of nontributary water and would increase for no good reason the need
to import additional out-of-basin water. However, in order to avoid the argument that such a mini-augmentation approach is precluded by the failure to give adequate notice, any application for water storage rights should specifically claim the right to refill continuously to maintain the level of the reservoir. Moreover, the augmentation plan application and resume should specifically list the storage right among both the water rights to be augmented and the water rights to be used for augmentation. A further step might also be to specifically claim credit for all return flows resulting from the subject reservoir.

A final emerging issue relating to reservoir rights is the matter of bank storage. One of the greatest pleasures a water attorney can experience is the joy of working with an innovative and first rate water engineer. While the legal profession is indeed fortunate to enjoy a number of excellent water engineers, there was none better than Raymond "Al" Hogan. His recent tragic death leaves a void that may never be filled. In connection with the Golden augmentation plan, Al demonstrated that in determining the true capacity of a reservoir and the extent to which reservoir releases can augment out-of-priority depletions, credit should be received for any water held in the banks of a storage facility.

Whether a given situation justifies the claim of bank storage will generally depend on two factors. The first is the geology of the area. If the reservoir is an old gravel pit where the banks are comprised of sand and gravel material, an appreci-
able amount of bank storage may exist. On the other hand, if the reservoir is in bedrock, there will be little reason to be concerned with this issue.

The second factor is one of economics. From an operations standpoint, test holes may have to be drilled around the perimeter of a reservoir to determine the extent of bank storage and the timing of releases resulting therefrom. Obviously, one must assess whether the cost of drilling and monitoring such test holes justifies the increased amount of storage water. However, irrespective of whether bank storage is claimed, an applicant should be wary of having the tables turned with respect to this issue. For example, where a considerable amount of bank storage may exist in a sand and gravel reservoir, objectors might insist on additional monitoring to assess the effect of reservoir releases on area groundwater supplies. As is the case with most facets of Colorado water law, one is faced with a double-edged sword.

If there is any message to be gleaned from the foregoing discussion, it would be that, when all is said and done, there is only one aspect of Colorado water law that is truly clear. Namely, where the need for water exists, enterprising minds will find a way to obtain the required supplies. The stakes may be getting higher and the resulting costs far more expensive, but there is no end to the innovative methods of obtaining one of the earth's most precious resources.
FOOTNOTES

1. The Williams Fork exchange is the means whereby Denver is able to store water in Dillon Reservoir and divert water through the Roberts Tunnel out-of-priority, in return for the release of an equivalent amount of water from Denver's Williams Fork Reservoir (see Fig. 3). The release of water from the Williams Fork Reservoir takes the call of the Shoshone Power Plant off of Green Mountain Reservoir, which, in turn, keeps Green Mountain Reservoir from calling out the upstream Dillon system. However, since this exchange does reduce the amount of water pumping through the hydroelectric facilities of Green Mountain Dam, Denver is obligated to reimburse the Bureau of Reclamation for lost power revenues. Currently, Denver pays the Bureau approximately $2.35 per acre-foot for the lost power.

2. All of the Summit County ski areas (Breckenridge, Copper Mountain and Keystone) are upstream of Dillon Reservoir (see Fig. 3).

3. Green Mountain Reservoir is a federal facility, and the contracting for water therefrom has been deemed a major federal action requiring compliance with the National Environmental Policy Act.


5. C.R.S. 25-8-601, et seq.

6. The reservoir in question is located near Estes Park just outside Rocky Mountain National Park. The task of proving the natural state of this facility was an absolute delight, and ultimately turned on a number of historical references to the lake prior to the known construction of the dam. In particular, in narrating her ascent of Longs Peak in 1873, there was a description of this lake in Isabella Bird's A Lady's Life in the Rocky Mountains. And who said mountain climbing is a frivolous hobby which bears no relation to the practice of law.

GENERAL LOCATION MAP

Figure 1
Figure 2

Colonel Augmentation Plan
Cornell Ditch Exchange: Upstream Parachute Creek Call by Low Cost Ditch

Wright Water Engineers, Inc.

Legend

Cornell Ditch
Alternate Points of Diversion

Low Cost Ditch
4.0 cfs Bypass by Low Cost Ditch

Divert 2.68 cfs at Colony Alternate Points of Diversion

Situation Bypass Flows Greater Than Cornell Historic Diversion:
The flow (4.0 cfs) bypassing the upstream diverting headgate exceeds the Colony portion of the historic Cornell Diversion (3.39 cfs). Excess 20 percent of this bypass (0.80 cfs) is upstream colony alternate portion of diversion (0.95 x 3.39 = 3.26 cfs). 15 percent is left in the stream to replace Colony’s share of the Cornell Ditch losses.

Scale 1/10 mile

Garfield County, Colorado

Figure 2