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Resource Law Notes Newsletter, no. 18, Sept. 1989

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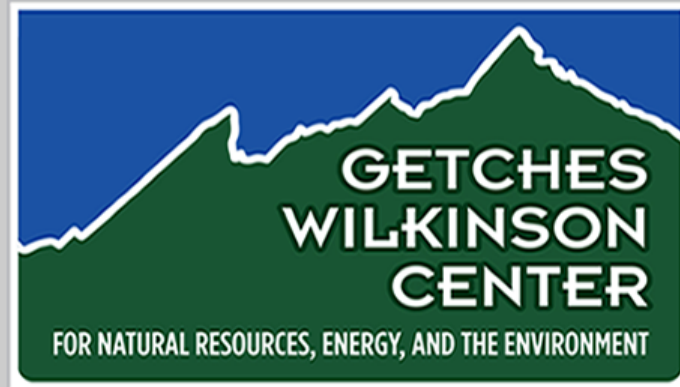
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Citation Information

Resource Law Notes: The Newsletter of the Natural Resources Law Center, no. 18, Sept. 1989 (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law).



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RESOURCE LAW NOTES: THE NEWSLETTER OF THE NATURAL RESOURCES LAW CENTER, no. 18, Sept. 1989 (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law).

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Resource Law Notes

The Newsletter of the Natural Resources Law Center
University of Colorado at Boulder • School of Law

Number 18, September 1989

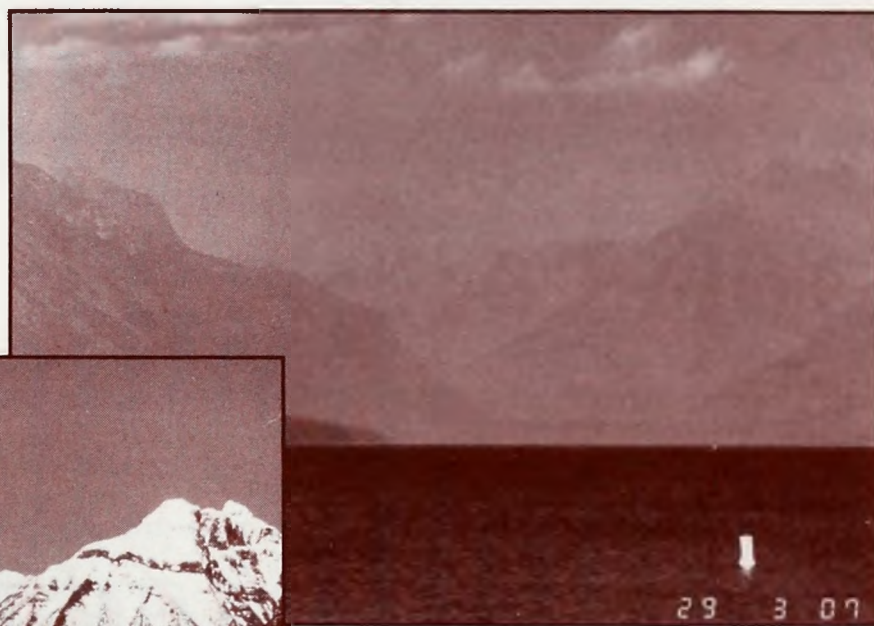
Center Sets Air Quality Conference for November

Visibility, acid rain, air toxics, and urban air pollution are the topics of an upcoming Center conference on air quality in the West. The conference will be held at the School of Law in Boulder on **November 27-28, 1989**. Presentations will describe the nature and scope of the issues, the existing legal framework and experience with its implementation, and proposed changes in the law. Emphasis will be placed on air quality issues in the West and efforts underway to address these problems. Special attention will be given to relevant amendments to the Clean Air Act under consideration by Congress.

Speakers include **Robert Yuhnke**, Environmental Defense Fund, **David Wooley**, New York Attorney General's Office, **Christine Shaver**, National Park Service, **Professor Mark Squillace**, University of Wyoming, **Jerry Gallagher**, Colorado Department of Health, **David Baron**, Arizona Center for Law, **Dr. Devra Davis**, National Academy of Sciences, **Kathy Tonnessen**, California Air Resources Board, **Ogden Gerald**, Office of Air Quality Planning and Standards, U.S. EPA, **Robert A. Bethel**, M.D., University of

Colorado Health Sciences Center, and **Michael P. Walsh**, Technical Consultant, Washington, D.C.

For further information about this program, contact Kathy Taylor at the Center (303/492-1288).



View within Glacier National Park on a good and a bad air quality day.

Center Publishes Book on Instream Flow Protection

Western water law has been revolutionized in the past 20 years by the changes made to provide some kinds of protection for nonconsumptive, instream uses and values of water. These changes are summarized and discussed in *Instream Flow Protection in the West*, edited by Lawrence J. MacDonnell, Teresa A. Rice, and Steven J. Shupe. Part I contains seven chapters which provide discussions of major policies and issues in the instream flow area. Part II provides 14 chapters on the instream flow laws and programs of the western states.

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INSTREAM FLOW PROTECTION IN THE WEST



Edited by Lawrence J. MacDonnell,
Teresa A. Rice, and Steven J. Shupe

Natural Resources Law Center
University of Colorado School of Law

This book can be purchased from the Natural Resources Law Center for \$20 (add 6.23% tax if in Colorado). Please write the Center or call (303/492-1288).

A Review of

Law of Water Rights and Resources • A. Dan Tarlock

Professor Tarlock has admirably filled the long-standing need for a modern, single-volume treatise on the law of water. Published in 1988 by Clark Boardman, the *Law of Water Rights and Resources* provides a comprehensive, yet highly readable presentation of the legal principles governing the allocation and use of water resources in the United States. It is a masterful summary and distillation of a highly complex and somewhat arcane field of the law by one of its leading scholars.

The treatise begins with a short chapter on the hydrologic cycle which introduces several considerations important to understanding water law and policy. It then provides a summary of the common law of riparian rights. It turns to a consideration of the law of groundwater allocation. It next provides a remarkably concise summary of the prior appropriation doctrine. Appropriation of groundwater is treated next. This is followed by a short chapter on the adjudication of water rights. The increasingly important topic of public water use rights is treated next. Then federal allocation and regulation of water is discussed. Finally, the law related to interstate allocation is summarized.

This single-volume reference provides an excellent guide

to the legal principles governing obscurities of water law, such as the navigation servitude and diffused surface waters, as well as to topics of very current interest such as the public trust doctrine. Professor Tarlock has done the very hard work of digesting the complex and often conflicting sources in these and other topics and distilling out the major points. He uses selective references to cases and some secondary materials in support of his presentation. He provides a balanced treatment of the issues, indicating in appropriate instances where splits of opinion exist among the jurisdictions or where different views are held about unresolved issues.

The water law field has not had a treatise by a sole author since the outstanding works by Samuel Wiel and C.S. Kinney were last published in the early 1900s. Much has happened in this area of the law since that time. Anyone whose work touches the area of water law, whether on a regular basis or only periodically, will benefit from having ready access to this excellent reference.

- LJM

Bureau of Reclamation Water Transfers Study Begins

"Facilitating Voluntary Transfers of Bureau of Reclamation Supplied Water" is the subject of a new Center research project. Funded in part by a grant under the federal Water Resources Research Act, the project will extend the water transfers research presently underway at the Center and will permit a more detailed examination of the opportunities for transfer involving water supplied by Bureau of Reclamation projects. **Bruce Driver**, a Denver-based lawyer and consultant, will work with Center director **Larry MacDonnell** on this project. **Richard Wahl**, an economist in the Office of Policy Analysis of the U.S. Department of the Interior and a former Center Fellow, also will be involved. The 12-month project will be completed in summer 1990.

Bureau projects delivered 31.5 million acre-feet of water in 1986 in the 17 Western states. About 86 percent of this water went to the irrigation of nearly 10 million acres of land. For

many years, questions have been raised about the transferability of this water. As interest grows in voluntary reallocation of developed water supplies to growing and changing water uses in the western states, the relatively untapped potential involving Bureau-supplied water appears to be very attractive.

In some project areas, transfers are occurring. A well-known example is the active market in water allotments involving water from the Colorado-Big Thompson Project in the Northern Colorado Water Conservancy District. Such examples, however, appear to be the exception. The project aims to identify the factors explaining the variability in transfer activity among project areas and to recommend ways to facilitate additional, economically warranted transfers consistent with the protection of important existing interests.

Boundaries & Water Conference Held June 1989

Over 100 registrants from 20 states, the District of Columbia, and Canada, participated with 25 speakers and panelists in the Center's June 1989 water law conference on *Boundaries & Water: Allocation and Use of a Shared Resource*. The group examined the legal and institutional frameworks governing both ground and surface water between governmental

entities, and looked at areas of conflict and opportunities for cooperation in seven river basins.

The course notebook and audiotapes are available from the Center. Please see the list of Center publications (p. 11) to order.



(left) Former Governor of Arizona, Bruce Babbitt, comments on "Shoot-Out at LaPaz County" at **Boundaries & Water** conference lunch.

(right) William McDonald, Director of the Colorado Water Conservation Board, comments on inter-jurisdictional issues on the Colorado River.

(lower left) Prof. Charles Howe, Economics, University of Colorado, asks question of the Colorado River panel.

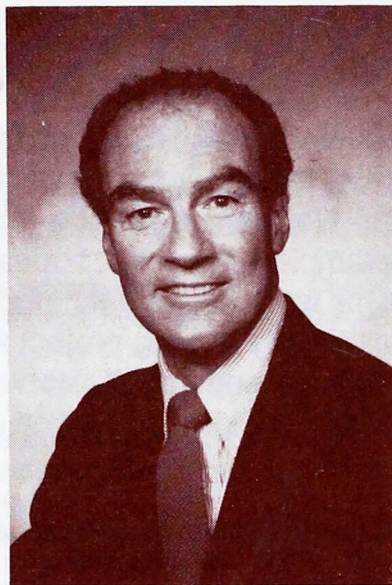
(lower right) Maggie Fox from the Sierra Club presents an environmental viewpoint on Colorado River matters.



Bent Pegs and Round Holes: New Concerns for Oil and Gas Commissions

Kemp Wilson*

A new strain of "gold rush fever" appears to be infecting the oil and gas industry in the Rocky Mountain states. Recent articles in oil and gas trade publications have extolled the virtues of horizontal drilling, and the technique is firing the imaginations of a number of producers. Reporting that over 60 horizontal wells were drilled in North America in 1987, the October 1988 issue of *World Oil* projected that "these figures will increase logarithmically in future years, due to the production successes occurring in these wells."



Indeed, at least one operator appears to be batting 1000.00 in the horizontal well game being played in the Rockies. The December 15, 1988, *Montana Oil Journal* reported that Meridian Oil Inc., had successfully completed more than one-half dozen horizontal wells in North Dakota, three in Montana, and had run production casing on the first wildcat horizontal well in the Williston Basin. Subsequent issues of the Journal have outlined an ambitious horizontal well drilling program planned by another substantial operator in the same area.

Horizontal Drilling

Modern horizontal (lateral) drilling is essentially the application of new technology and equipment to the "drain hole" concept developed in the 1920s and '30s. By utilizing unique methods of directional control which differ from those em-

ployed in conventional directional drilling, and measurement-while-drilling tools and steerable motors, operators are now able to drill vertically to a target formation, turn on a surprisingly short radius into the formation, and extend the borehole for thousands of feet in the formation. The three major horizontal well completion methods were recently graphically described to the Interstate Oil Compact Commission at its 1988 mid-year meeting. (Fig. 1)

On paper, and apparently now in practice, horizontal well completion techniques have given operators an ability to obtain optimum primary production from thin, discontinuous formations, and formations with low permeability or matrix porosity by exposing much more of the formation to the pressure differential which occurs at perforation points. (Fig. 2) It is the addition of new target formations that has caused much of the excitement in the oil and gas community, and put landmen back in the field seeking to lease acreage that was dropped in the downturn of oil prices in the mid-1980s.

However, it is the economics of horizontal wells that have brought to issue the manner in which such wells should be treated from a regulatory standpoint. Performance multiples of 2 - 10 times vertical well

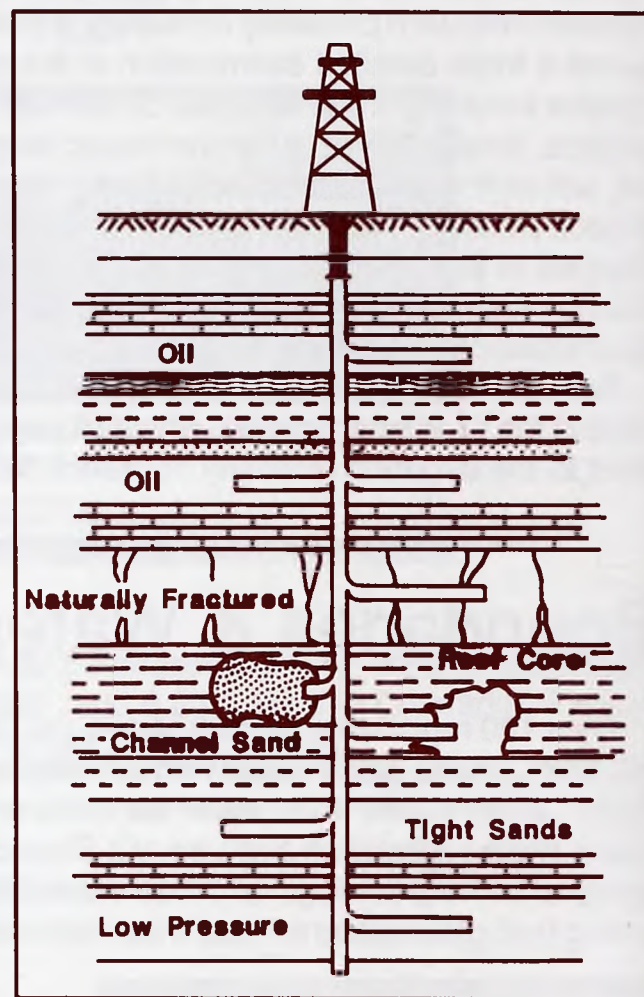


FIGURE 2: Horizontal Drilling A Problem Solving Completion Technology

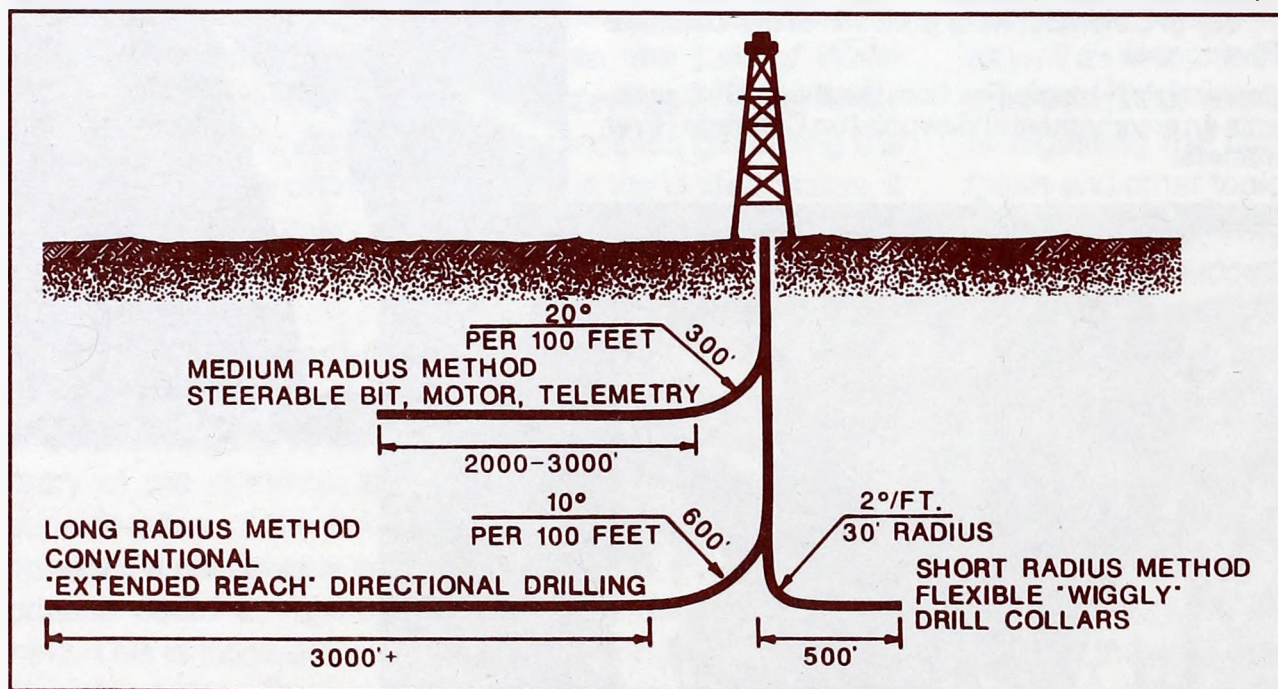


FIGURE 1: Horizontal Drilling—3 Major Methods

* Attorney, Crowley, Haughey, Hanson, Toole & Dietrich, Billings, Montana. Mr. Wilson was the Burlington Northern Fellow at the Natural Resources Law Center in 1988.

** Figures 1, 2, and 6 are reproduced with permission from "Horizontal Drilling—A Key to Enhanced Recovery," by James C. Allen, in *The Interstate Oil and Gas Compact & Committee Bulletin*, June 1988.

productivity at costs of 1.5 to two times the cost of drilling a traditional vertical well raise questions in the minds of offset operators as to how horizontal wells fit into the scheme of well spacing already in place in the Rocky Mountain states.

Conservation Regulation

The oil and gas conservation acts of nearly all Rocky Mountain states are the offspring of the 1950 model legislation promulgated by the Legal Committee of the Interstate Oil Compact Commission. The model act suggested three ways of preventing (or at least controlling) waste and protecting correlative rights—(1) well spacing, (2) individual well or field production restrictions, and (3) proration based upon market demand. However, the legislatures in most of the Rocky Mountain states rejected the concept of market demand proration, and have delegated only spacing and production restriction authority to the respective oil and gas conservation boards and commissions. In turn, most state commissions in the Rocky Mountain region find the imposition of production restrictions distasteful, and have routinely resorted to well spacing as the primary means of achieving waste prevention and the protection of correlative rights.

Colorado's well spacing statute typifies the "generic" spacing authority granted to regulatory agencies:

[1] TO PREVENT OR TO ASSIST IN PREVENTING WASTE; [2] TO AVOID THE DRILLING OF UNNECESSARY WELLS, OR [3] TO PROTECT CORRELATIVE RIGHTS—

The Commission [may] establish drilling units—

[a] of specified and approximately uniform size and shape—

[b] no drilling unit shall be smaller than the maximum area that can be efficiently and economically drained by one well—

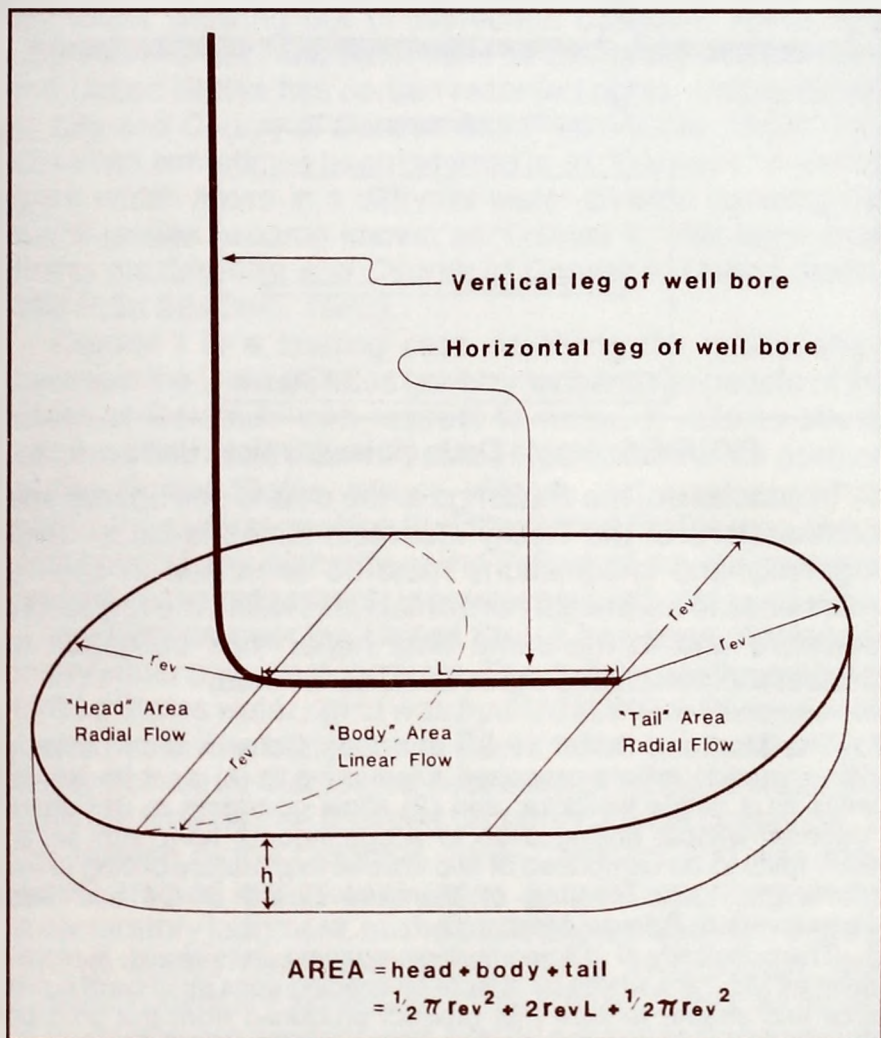


FIGURE 3: Conceptual Description of Drainage Area for a Horizontal Well

[c] only one well [shall] be drilled and produced from the common source of supply on a drilling unit. (Colo. Rev. Stat. Sec. 34-60-116)

Well Spacing

Typically, the scenario played out when a commission or board is considering the spacing applicable to a given area following discovery is that the areal extent of the common pool subject to drainage is determined, and testimony is received concerning oil in place, recoverable reserves, projected rates of recovery, and the number of wells that can be economically drilled given well costs and projected rates of return on investment. In practice, operator-applicants will request — and the commissions will usually grant — spacing units of the size and shape historically assigned to a given formation at similar depth.

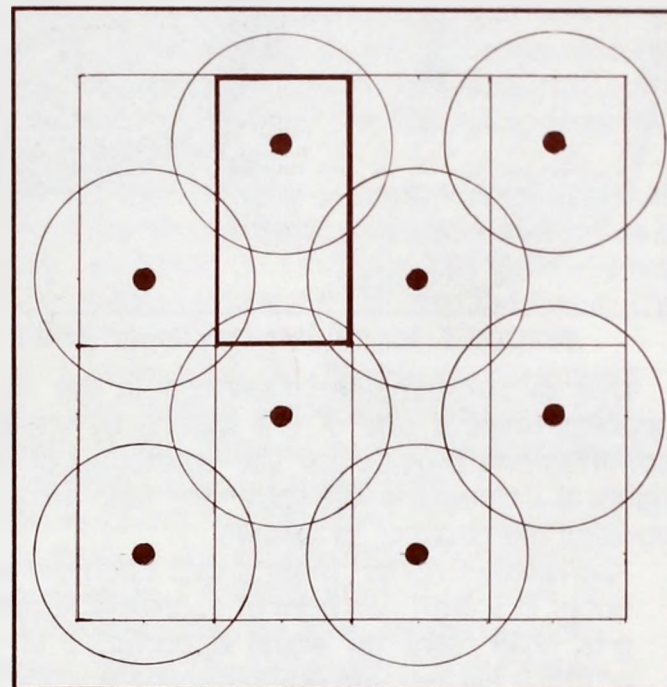


FIGURE 4: Rectangular Spacing (80-320 Acre) "Patterned" Compensated Drainage

Given this normal well spacing procedure, spacing today is largely the spacing of yesteryear, which is the product of vertical drilling operations. Historic spacing patterns normally utilize subdivisions (or combinations thereof) of the governmental rectangular survey system which is in place in all of the Rocky Mountain states, and such utilization has its roots in the uniformly-accepted engineering principle that vertical wells are presumed to have circular drainage patterns. In contrast, horizontal wells will (assuming reservoir homogeneity) display an oblong-shaped drainage area. (Fig. 3)

Traditionally, conservation boards have attempted to meld the circular drainage concept with mineral and leasehold ownerships which normally employ rectangular survey subdivision boundaries by the unspoken notion of "compensated" drainage. That is, although a round drainage pattern does not fit neatly into a square spacing unit, if all other wells in the surrounding spacing units have a similar theoretic drainage pattern, then each owner is, ideally, compensated for any drainage of acreage within his unit by the well of another unit.

"Patterned" spacing dramatically demonstrates how boards and commissions employ the compensated drainage idea. When rectangular (80 acre or 320 acre tracts) spacing units are created rather than square spacing units (40 acre, 160 acre or 640 acre tracts), the spacing order normally will require that the permitted wells for adjoining spacing units offset one another diagonally rather than directly. An overlay of a circular drainage pattern upon each well reflects that a major portion of the production for each well will come from the adjoining unit, thus resulting in "compensation" on a field-wide basis. (Fig. 4)

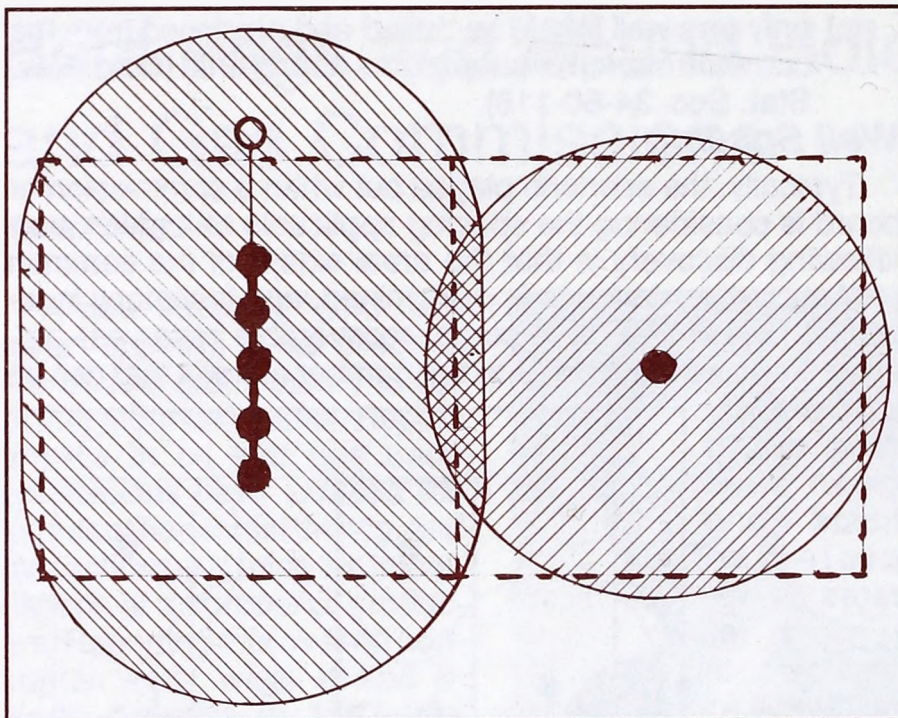


FIGURE 5: High Point #1-1 Offset #1-2 Drainage

Use of compensated drainage in the configuration of spacing units is one of the means by which boards and commissions provide for the protection of the correlative rights of interest owners within the field area. Colorado has codified the concept as follows:

“Correlative rights” means that each owner and producer in a common pool or source of supply of oil and gas shall have an equal opportunity to obtain and produce his just and equitable share of the oil and gas underlying such pool or source of supply. (Colo. Rev. Stat. Sec. 34-60-103(4)).

The definition of “equal opportunity” in practice is imprecise, but the language employed by the Interstate Oil Compact Commission in its 1942 Standards of Allocation of Oil Production gives a flavor for the thought process that should be utilized by the regulatory agency in its spacing decisions:

Within reasonable limits, each operator should have an opportunity, equal to that afforded other operators, to recover the equivalent of the amount of recoverable oil underlying his property. The aim should be to prevent reasonably avoidable drainage of oil and gas across property lines that is not offset by counterdrainage.

Spacing for Horizontal Wells

With the growing popularity of the horizontal well concept, conservation agencies must come to grips with the manner in which such wells will be integrated into the historical methods of well spacing. More specifically, if operators have the option of drilling either a horizontal or a vertical well, does this voluntary option satisfy the “equal opportunity” standard, or should the assignment of spacing unit size take into consideration the fact that horizontal drainage patterns will likely encompass a larger area than the circular pattern of the traditional vertical well? (Fig. 5) An even harder question is whether the Rocky Mountain boards and commissions will be forced to consider proration of production from horizontal wells drilled in fields developed via vertical drilling and spaced accordingly.

Of course, there are many aspects of both drilling methods which the regulatory agencies will need to take into account when considering these issues. For example, Oklahoma’s Corporation Commission is the first agency to adopt regulations governing horizontal “drainholes”, and it seized upon the similarity of a stimulation technique commonly employed

in vertical wells to the practical result of horizontal drilling in the adoption of rules treating horizontal wells as a “single wellbore”:

3.1... Lateral drilling is an alternative to vertically drilling and hydraulically fracturing the productive interval in a well. . .

3.2 The final rules treat a well with one or more horizontal drainholes as a single wellbore because of the similarity in performance between lateral completion and hydraulic fracture stimulation of a vertically drilled well. Okla. Corp. Comm. Order No. 326344 (June 1, 1988) (The new rule concerning horizontal drilling is OCC-OGR Rule 3-211).¹

IOCC Recommendation

The Interstate Oil Compact Commission’s Council of State Regulatory Officials Horizontal Drilling Sub-Committee has drafted a “model form” horizontal well rule identical to the new Oklahoma rule (Sub-Committee Memorandum, December 6, 1988), but at the 1989 mid-year meeting of the Council adoption of the form was postponed at the request of officials of a market proration state pending further study of the need to incorporate the concept of allowables in the recommended form. The IOCC received a comprehensive report on horizontal drilling at its 1988 mid-year meeting (Allen, *Horizontal Drilling—A Key to Enhanced Recovery*, 1988 Interstate Oil & Gas Compact & Committee Bulletin, Vol. II, No. 1), and received recommendations concerning spacing (maintenance of traditional minimum distances); possible use of allowables or production restrictions as a means of factoring length of the horizontal drainhole into spacing decisions; and the assignment of multiple spacing units to a horizontal well² (Fig. 6).

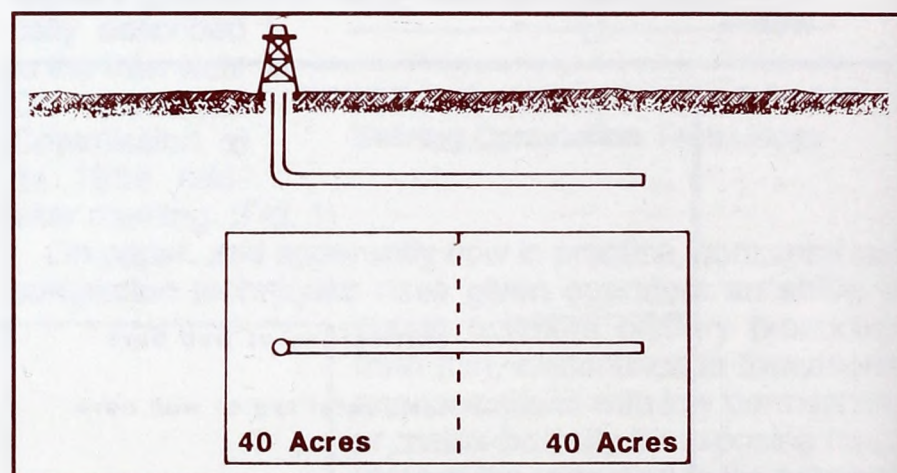


FIGURE 6: Single Drain Holes/Multiple Units

In conclusion, the challenge to the oil and gas boards and commissions of the Rocky Mountain states is clear—their ingenuity and imaginations must be exercised in such a manner as to assimilate horizontal wells within the regulatory structure and at the same time honor their obligation to protect the correlative rights of all concerned.

¹ The Montana Board of Oil and Gas Conservation recently determined to initiate proposed rulemaking to (1) treat horizontal wells as a single wellbore; and (2) allow operators to designate “optional wildcat drilling units to accommodate horizontal wells, such units to be comprised of two normal exploratory drilling units. (June 29, 1989 Meeting of Montana Board of Oil and Gas Conservation, Billings, Montana)

² The possibility of utilizing multiple spacing units would, in states such as Montana where by statute all spacing units must be of equal size and shape, require that product produced from the bore be shared by the respective spacing units penetrated by the horizontal well. The well would be considered as *the* producing well for each such spacing unit.

Reflections on Sixty Years of Water Law Practice

Glenn G. Saunders*

This is the third in a 3-part series by Glenn Saunders. The first two sections were published in "Resource Law Notes" issues 16 & 17. The entire series is available as an Occasional Paper from the Center (see Publications list p. 11).

At the end of the second installment of "Reflections on Sixty Years of Water Law Practice," Saunders discussed the McCarran Amendment, why it was needed and how it has been interpreted judicially. The McCarran Amendment was in response to a need to define the relationship between federal water rights and state water law. It gave consent to join the United States as a defendant in any suit for the adjudication of rights to the use of water of a river system or other source or for the administration of such rights.



Federal Reserved Water Rights

In spite of the plain language of McCarran that in the adjudication of water rights the United States, by the terms of this law, could not plead that the state laws are inapplicable, the Colorado Supreme Court, relying on U.S. Supreme Court decisions growing out of protection of Indian rights, discounted this law, and other laws of congress, and held that the United States has certain reserved rights. *United States v. City and County of Denver*, 656 P.2d 1 (Colo. 1982). This case has sometimes been referred to as "Denver I." A similar case which arose in a different water division covering the same issues became known as "Denver II," this latter case being entitled *City and County of Denver v. United States*, 656 P.2d 36 (Colo. 1982).

Denver I is a leading case resolving the relationships between the United States government and the people of the State of Colorado with respect to water. It reflects efforts commenced more than 10 years earlier to define the position of the United States, whose officers and employees had taken the general position that the United States was above and beyond any authority of the individual sovereign states and did not have to comply in any respect with state water law.

Jurisdiction over the United States has been obtained in every water division in the state. The question of the extent of United States water rights was pushed in Water Divisions No. 1 and No. 5. The trial judge in Division No. 1 in the Denver II case, Donald A. Carpenter, had been steeped in water law from the time he had assisted his father, Delph Carpenter, in the making of the Colorado River Compact and was thoroughly trained in the law of water. Judge Carpenter entered a declaratory judgment, on the basis of the pleadings, that the United States held no reserved rights in Colorado, that Colorado laws are applicable to the United States, as stated in the McCarran Amendment, that by accepting Colorado into

the union with a constitution providing that all of the waters of the state belonged to the state itself and that even before that, the United States, by the Desert Land Act of 1877, the Act of July 9, 1870, and of July 26, 1866, the United States had recognized that the water of the reclamation states belonged to the people of those states. It was also noted that the property of the United States can be disposed of only by an act of the Congress and that, with respect to the statutes just mentioned, there had been a disposal by Congress of the waters of the reclamation states. The Colorado Supreme Court refused to uphold Denver II.

In the decision in Denver I, the Supreme Court acknowledged that: "The doctrine of federal reserved water rights is judicially created." 656 P.2d 1, 17 (Colo. 1982). There has never been an act of Congress creating reserved rights. The Supreme Court in Denver I went on to say:

Based upon a recognition of Congress' underlying power, the United States Supreme Court has constructed a body of law, derived by judicial implication from congressional actions, holding that:

"Congress, in giving the President the power to reserve portions of the federal domain for specific federal purposes, *impliedly* authorized him to reserve 'appurtenant water then unappropriated to the extent needed to accomplish the purposes of the reservation.'" *United States v. New Mexico*, 438 U.S. at 699-700, 98 S. Ct. at 3013-3014 quoting, *Cappaert v. United States*, 426 U.S. at 138, 96 S. Ct. at 2069 (emphasis in original).

Feeling obliged to follow decisions of the United States Supreme Court respecting reserved rights, in spite of the peculiar situation of Colorado with its constitutional provision, accepted by Congress, that all the waters of Colorado belong to the people of the State of Colorado, the Colorado Supreme Court in Denver I determined that the United States does have reserved rights in those unappropriated waters available at the time of a land reservation without which the purpose of the land reservation would be wholly defeated.

Since that time, in a matter concerning the oil shale claims of the United States, in *United States v. Bell*, 724 P.2d 631 (Colo. 1986) the Court held that the United States can amend an original application but the amendment takes the priority date of the amendment and not the original application, thus upholding Colorado's antedation law.

Regulation of Municipal Water Rates

Because of a wide law practice outside the Board of Water Commissioner's business, I have also been involved in the application of the constitutional provision that no special commission created by the legislature may take control of any municipal assets. The Supreme Court of Colorado, itself a state agency, has not favored this limitation on the powers of state agencies, and it has found ways to limit it, particularly in the electric field. Under the constitutional provision, a municipally-owned water system may not have its rates or practices governed by the Colorado Public Utilities Commission, which is a special commission created by the legislature. The provision was followed in a case involving the Denver Water Department entitled *City of Englewood v. City and County of Denver*, 123 Colo. 290, 229 P.2d 667 (1951).

* Attorney, Saunders, Snyder, Ross & Dickson, Denver.



Control facilities in Denver Reuse Plant. Photo courtesy of Denver Water Board.

Municipal Ownership of Water

In Colorado, most domestic water utilities are municipally-owned. As discussed, such municipal water utilities are not subject to regulation by the Colorado Public Utilities Commission. Another facet of municipal water ownership of water is that, contrary to the law of contract carriage for agricultural users who are the true owners of the water rights, the customers of a domestic utility are not the true owners. In a transfer case, the customers of a municipal utility are never made parties. Nor do such customers have to be consulted with respect to the acquisition or disposition of the water rights of the utility.

The universal custom in Colorado is that a purely domestic water utility is the owner of the water rights and may deal with them without consulting the ultimate users.

This is a necessary rule for practical reasons. Taking the most extreme example, when the City and County of Denver is a party to water litigation, the million people who receive that water could not, in any practical sense, become parties to the litigation. Nor could any one of those, or even a combination of those who are users decide to take a portion of the water supply and divert it through their own facilities as can be done by agricultural users if they choose. The domestic water utility is related to its users in the same way as an electric utility without regard to the law governing the exercise of water rights.

Water Quality

Water law has developed to the point where now it is much more than a question of putting water to use from natural streams or underground aquifers, and has entered into the law of water quality and the character of return flows. It is no longer enough to have a water supply. When a developer plans to create more housing, more manufacturing, or more office facilities, water for these enterprises must be disposed of so as not to impair the quality of the waters into which the return flows are inserted. Consequently, the field of water law has now become a field of environmental law in which the legal adviser must contemplate not only securing a supply but the disposal of that supply in a safe and economical manner.

Colorado water law is a complete deviation from the old English common law, which required natural streams to be allowed to flow undiminished in quantity. Necessity in this arid region created a new common law encouraging the removal of water from streams to meet the needs of a civilized society. But the law continues to follow that part of the old English

common law, which required natural streams to be left unimpaired in quality. In what is known as the *Chain O'Mines* case (*Wilmore v. Chain O'Mines*, 96 Colo. 319, 44 P.2d 1024 (1934)), tailings from mill operations were emptying into Clear Creek Canyon above agricultural lands irrigated by this water. These tailings were filtering out when the water was applied to the land so that in a field of corn which was a quarter mile in length along the distribution system, the first corn would be a foot high while the corn at the end of the row would be five or six feet tall. In a suit to enjoin the miners, District Judge Charles C. Sackmann in the Denver District Court held that a reasonable amount of pollution had to be permitted because both the miners and the agriculturalists had to be accommodated. The Supreme Court reversed in the *Chain O'Mines* case, saying that the miners had no right to pollute the stream so that its quality was below that of the natural watercourse. This was particularly important in this state because it affected the waters of Clear Creek, properly named because in its natural state, it runs through rock and gravel so as to be very clear and practically pure snow water. This early legal pronouncement is being emphasized more and more today.

Decrees giving a right to divert for beneficial use referred entirely to volumes of water and not at all to the quality of that water. This matter came up in *A-B Cattle Co. v. U.S.*, 196 Colo. 539, 589 P.2d 57 (1978) when the Pueblo Reservoir, constructed in the streambed of the Arkansas River, changed the quality of the river from heavily sedimented to essentially clear water so that the Bessemer Ditch, which had always been sealed by the natural sediment in the Arkansas River, became porous and leaky.

The court was strongly divided as to the disposition of this case. The original majority held that an appropriator has the right to the natural quality of a stream without man-made modifications of that quality. On rehearing, Justice Don Kelly changed his position and accepted what had been originally the minority view that only H₂O is subject to appropriation, and therefore the appropriator has no right to the quality of water in the stream as it was in its state of nature.

What the final Groves majority had overlooked is the fact that the Colorado Constitution does not merely say that pure water is subject to appropriation, but says the "water of every natural stream" is subject to appropriation. This certainly does not refer to distilled water or pure H₂O. In the dissenting opinion, which originally was the majority opinion by Justice William Erickson, appears the sentence: "I sincerely hope that this Court will reconsider this issue in future years." It is my view that this case must be reconsidered along with *Colorado Springs v. Bender*, 148 Colo. 458, 366 P.2d 552 (1961). They are a part of developing law to which the legislature is going to have to give consideration if it expects the Supreme Court to avoid becoming a legislative body to fill a vacuum not filled by the legislature.

The gist of *A-B Cattle* is that the change in stream content was man-made, just as in *Chain O'Mines*. No one today questions that it is unlawful to dump man-made toxic material into a natural stream. The final decision in *A-B Cattle* overlooks the fact that the change in water quality complained of was man-made.

The recent New Mexico case of *Ensenada v. Sleeper* involved a transfer of a decreed right which worked a man-made change in the quality of stream flow. The court relied on *A-B Cattle* in allowing the change, overlooking the fact that the change in water quality was man-made.



Wastewater treatment plant.
Photo courtesy of American Water Works Association.

Changing Beneficial Uses of Water

There is a change in the philosophy of what constitutes a beneficial use which has occurred since 1860. As the United States has developed, in addition to ranching and agriculture, Colorado now has become a national asset, not only as an educational and technical center, but also as a recreational center. Some of the best values in Colorado are to be found in its high mountains, its forests, its streams.

There is a change in the philosophy of what constitutes a beneficial use which has occurred since 1860.

The diversion of water is totally unnecessary for the preservation of its forests except for the low value Blue Spruce, which has to have its feet wet. Other evergreens obtain all their water nourishment from their needles. However, these forests can provide substantial storage where the trees are open enough so that they act as a windbreak to drop blowing snow into open spaces where it can reach the natural watercourses. Under a law passed by the United States Congress, the national forests are to be maintained for the purpose of providing a continuous supply of water and timber. 16 U.S.C.A. Section 475 (1985). These two objectives are consistent because with timber cutting which provides open spaces for precipitation to fall and the timbered areas to impede the flow of air so that the snow and rain will get to the

earth, both timber and water are supplied. This is why there should be no wilderness areas where there are forests because they are unproductive and inaccessible for recreation to about 98% of the American public.

Cutting trees to create ski slopes creates open spaces where snow can fall and also creates an economic benefit to the state. Ski areas require a domestic supply of water, which means that a substantial amount of high-altitude water needs to be retained to sustain the ski industry.

Another area of recreation is river rafting and kayaking. A very early statute permitted the floating of logs on our streams. With modern transportation, this statute can be repealed as unnecessary. On the other hand, river rafting and kayaking have become a major sport and a major economic benefit to Colorado. The diversion of water out of the streams so as to diminish their flow impairs this kind of use. Such a use, at the beginning of Colorado, would have been unthought of. It would not have been considered beneficial. Beneficial use must necessarily mean utility for the needs of mankind. Mankind today does want river rafting, and consequently the maintenance of streams for this sort of use has become a beneficial use which was not in existence at the time Colorado water law was first envisioned. Colorado law does not yet adequately meet this problem, particularly in that it attempts to give the state of Colorado the sole right to appropriate water for this beneficial use, although the constitution clearly says that the right to appropriate water for beneficial use shall never be denied to anyone.

Interstate Water Allocations

Because Colorado is at the high point in the Northern Hemisphere of the range of mountains that runs from the south to the north throughout the Western Hemisphere, waters from its natural water courses flow out of the state and into other states. Broadly speaking, legal rights with respect to the waters of these interstate streams are treated the same as waters moving from one fully sovereign state to another. In Europe, water moves in international streams from one nation to another. Each of these nations is sovereign. The same thing is true of the states of the United States except to the extent that they have given up a portion of their sovereignty to the Union. The basic law of interstate streams in the United States as it affects relations between various states is the same as the law of international streams between fully sovereign nations.

There are many refinements but, basically, each sovereign has the right to an equitable apportionment of the waters of an interstate stream. The equity is based on preservation of the existing civilization. This requires a consideration of such matters as maintenance of commerce and of water quality. The international law protecting commerce is strongly influenced by the commerce clause of the United States Constitution, as recently illustrated in the case of *Sporhase v. Nebraska*, 458 U.S. 941 (1982) in a matter which is not directly within the experience of the writer.

Allocations of the Colorado River

Well within the immediate experience of the writer, however, is the Colorado River Compact and the Upper Colorado River Compact. The operation of the terms of the Colorado River Compact should be of great concern to the states of the Upper Basin.

The Lower Basin states of the Colorado River Drainage Basin are endeavoring to create a perception that, aside from the Mexican commitment, the states of the Upper Basin must supply them with 7-1/2 million acre-feet of water from the

Colorado River at Lee Ferry each year, regardless of any deficiency in runoff, so that if there is less than 15 million acre-feet of water available at Lee Ferry in any year, the entire shortage must be borne by the Upper Basin. The time may now be approaching when this concept should be rectified.

Article III(a) of the Compact makes an apportionment of water of 7-1/2 million acre-feet to the Upper Basin and 7-1/2 million acre-feet to the Lower Basin. It was thought that there was substantially more than 15 million acre-feet available for division and, therefore, Article III(b) provided for the Lower Basin to increase its beneficial consumptive use by 1 million acre-feet per year. In addition, paragraph (c) provided for water for the Republic of Mexico out of surplus waters above the 16 million acre-feet provided for in subparagraphs (a) and (b). Subparagraph (c) also provided that if there was not a sufficient surplus to meet the Mexican obligation, the burden of any such deficiency would be borne equally by the Upper and Lower Basins, again emphasizing an equal division of responsibility. Subparagraph (f) provided for a further equitable apportionment any time after October 1, 1963, after the 16 million acre-feet had been totally consumed. Since 1963, the river has never reached 15 million acre-feet. Consequently, all thought of a further apportionment has been abandoned.

In order to avoid the injury which might occur as the result of a particularly dry year or dry period, Article III(d) attempted to make the equal division of water between the Upper and Lower Basins workable by providing a ten-year running average of 75 million acre-feet, rather than requiring 7-1/2 million acre-feet each and every year.

When Article III(c) provided for Mexico's claims, it clearly made the additional apportionment of Article III(b) water a burden to be borne equally by the Upper and Lower Basins without providing a guarantee of flow by the Upper Basin. Careful consideration should be given to the proposition of whether or not the III(b) apportionment was intended not to interfere with the basic apportionment of 15 million acre-feet, but effective only if there were a surplus over that amount, regardless of the further apportionment provided for in III(f). There is provided in III(f) for further apportionment of flows beyond the 15 million acre-feet anticipated in III(a), the one million acre-feet in III(b), and the Mexican water of III(c). III(f) leaves the apportionment wide open—all to Lower Basin, all to Upper Basin, or whatever. Of course, the additional apportionment under III(f) available after 1963 will not occur, as we discuss below.

... it must be borne in mind that there is an evident intent in the Compact to divide the water equally between the Upper and Lower Basins ...

Those in the Upper Basin who have responsibility for implementation of the Colorado River Compact and the Upper Colorado River Compact need to keep in mind that Article III(a) and (b) are apportionments of water, but that Article III(d) is not an apportionment but simply a device to implement the apportionment. When the Lower Basin seeks to use III(d) as an guarantee of 7-1/2 million acre-feet of water annually, on an average, it must be borne in mind that there

is an evident intent in the Compact to divide the water equally between the Upper and Lower Basins, and that III(d) is simply an ill-conceived manner of dividing the water equally based on a mutual mistake of fact.

Flows Available in the Colorado River

The State Engineer is exceedingly well aware of the fact that of the 26 years of recorded flow at Lee Ferry prior to the negotiation of the Compact, the last 24 years far exceeded 150 million acre-feet per decade of water available for division. The fact is that the division was made on recorded flows which are the highest in the entire history of the Colorado River and have never been met since the making of the Compact. The facts were sufficiently obscure at the time of the Compact negotiations that the states believed there would be a substantial amount of water available for further division among them in the future and provided a date for that further division. The date has long since passed, and everyone who knows anything about the matter is aware that there is no surplus, and, as a matter of fact, there is a deficiency of water when full utilization is made by each state of its allotment.

The fact is that the division was made on recorded flows which are the highest in the entire history of the Colorado River and have never been met since the making of the Compact.

In addition to physically recorded flows, we now have access to tree ring records which confirm the fact that the Compact was made on a mistaken set of facts, to wit: The flows used as the basis for division of water among the states of the Colorado River Basin were the highest since the year 1500. In addition, we are aware now of five drought periods which have occurred in the course of history of more than a third century each, when it is certain that the flows at Lee Ferry will be such that there is much less than 15 million acre-feet of water to divide between the Upper and Lower Basins. In fact, the river may become so deficient that unless there is equal division between the Upper and Lower Basins, and the Upper Basin is held to a 75 million acre-foot delivery at Lee Ferry for each successive ten-year period, there would be a substantial reduction in water for the Upper Basin states.

Reformation of the Compact

As a matter of equity and justice, the Lower Basin is entitled to know now, before it spends more money on further water development out of the Colorado River Basin, that it does not have an assured supply of 75 million acre-feet every ten successive years. In order that equities may not run against the Upper Basin, the time has come for the Upper Basin states to join together in litigation seeking the reformation of the Compact, which is a contract as well as a treaty among the states. Reformation of a contract can be made to conform to the true facts when the contract was made upon the basis of a mutual mistake of fact. The reformation would be on the basis of securing an equal division between the Upper and the Lower Basins which would simply require a change of the number to meet the now proven situation.

There is no reason to try to renegotiate the entire Colorado

River Compact. It has now been in operation for more than 60 years and is the basis for judicial decisions and the Upper Basin Compact, as well as federal legislation, all of which rely on the equal division of waters between the Upper and Lower Basins of the Colorado River. The principles of the Compact are sound: an equal division of the waters between the Upper and Lower Basins. The compact should simply be reformed to reflect its intent in the light of now known availability of water.

From a tactical standpoint, Colorado should not undertake the reformation effort alone. This should be a unanimous effort by all of the Upper Basin states. Colorado has histori-

cally been the leader, not only in creating water law, but in creating relations with other states, not only because of the capability of its people, but because of the necessity arising out of the fact that waters flow out of Colorado into other states with practically none flowing into Colorado, creating a need for Colorado to protect its interests either by judicial decision or compact involving downstream states. Although the principles above stated were delineated by a group of Coloradoans a number of years ago, it turned out that the political climate was adverse for Colorado to exercise leadership at that point. That time may be soon approaching.

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