Colorado Division of Water Resources

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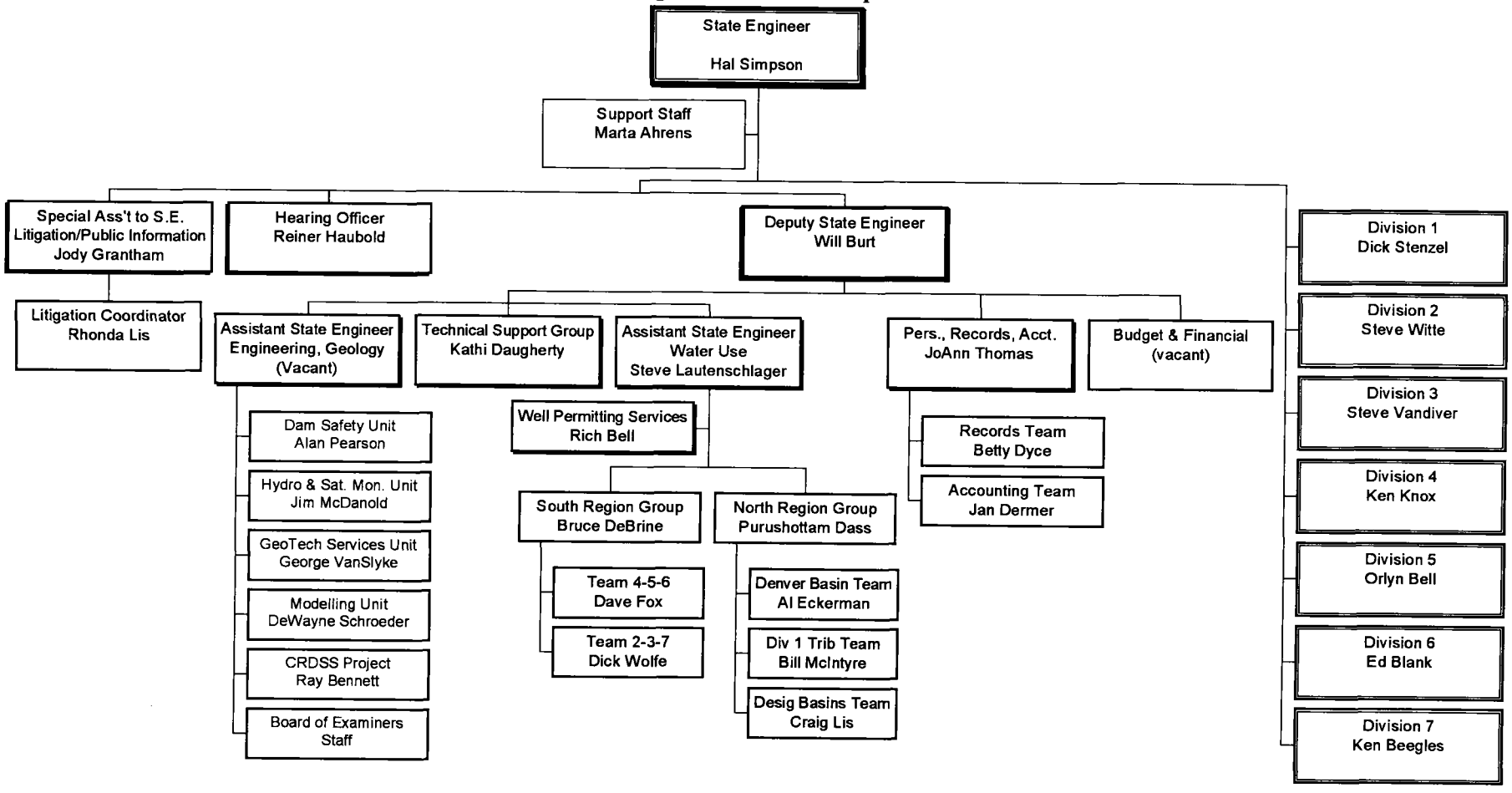
Annual Report

◆

1995

Division of Water Resources / Office of the State Engineer

Organization Units & Supervisors



DIVISION OF WATER RESOURCES

◆ ANNUAL REPORT ◆

1995

The Division of Water Resources is Colorado's principal agency in charge of administering the waters of the state. Created in 1889 as the Office of the State Engineer, the Division

- ◆ manages an administrative delivery system of water rights;
- ◆ oversees ground water well permitting;
- ◆ collects hydrologic data;
- ◆ ensures dam safety; and
- ◆ provides a host of other services dedicated to optimizing and maximizing the use of the waters of the State.

The Division's mission is to serve the water resource needs of the public and to distribute, conserve, protect, develop, and maximize the beneficial use of the state's present and future water supplies. We accomplish this mission through a dedicated staff of employees who are committed to public service and care about the management of Colorado's most precious resource, water.

Division of Water Resources
Department of Natural Resources
1313 Sherman, Room 818
Denver, Colorado 80203

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Cover photograph:
George Sievers, hydrographer for Division 1, measuring streamflow.

◆ NEW HORIZONS ◆
A MESSAGE FROM THE STATE ENGINEER

As State Engineer for Colorado, I want to take this opportunity to discuss some of the major accomplishments of our staff and the exciting directions that the employees of the Division are forging in managing the state's water resources. I believe that great strides have been made during the last three years, and I am truly looking forward to the future and the new horizons that lie ahead.

When I assumed the position of State Engineer in August of 1992, one of the goals I set was accessibility in public service. I believe it is imperative that government be accessible to the customers it serves. The employees of the Division have fully endorsed this sentiment as well. Over the past three years we have held numerous meetings with various water groups throughout the state in an effort to gain insight on issues of importance related to water. Some of the more significant events included meeting with attorneys and water resource professionals in Glenwood Springs and Alamosa, the cooperative efforts seeking innovative solutions to the issues resulting from the *Kansas v. Colorado* litigation, and my many visits to water districts throughout the state, to name just a few. As a result of these efforts, the Division has been able to gain valuable insight into the minds of our constituents, and they have provided us with ideas that are making the Division of Water Resources less bureaucratic and more responsive.

We are constantly implementing new means of dialogue through other media, and enhancing existing communication techniques. Through a cooperative agreement with the Division of Wildlife, a short 10-minute video is being produced on how to apply for well permits. When completed, this video will be available at all of our offices and will allow new customers to obtain answers to the most often asked questions and make the application process less painful for all concerned. We are also developing a wide range of simple brochures on numerous topics that will offer water users answers to commonly asked questions, as well as educating them on water issues facing the state.

Not only has the Division striven to be more accessible to the public, but we have determined to be much more responsive to the needs of our dedicated employees. An open door policy was established whereby any employee can sit down with me and discuss any issue on their mind. An Employee Council was established to examine innovative ways to recognize and reward employees and make suggestions to management and the State Engineer. Two-down management interviews have been instituted so that managers and supervisors get a real sense of what issues exist for their employees. Total Quality Management teams were established that involve employees in making decisions as to the Division's focus and how the numerous processes should operate to afford the greatest efficiencies in time and money.

Management and employees of the Division have completed a review of our organizational culture, i.e., the spoken and unspoken messages that we deliver as an organization. The preliminary results of that review indicated that we should focus on developing outstanding employees with desired qualities, developing future communication enhancement tools, and improving our office atmosphere to improve the perception the public has of the organization.

Cooperative agreements are being developed in many arenas to assist efficiency in government. One area being pursued is to utilize the Division Engineer's consultation process as a communication

tool for sister agencies in the Department. Rather than oppose some water court cases of smaller concern, these agencies, the Water Conservation Board, Parks, Wildlife and the Land Board, would send a letter to the Division Engineer to include their comments in his consultation, resulting in less litigation and smoother communication with water court applicants from all DNR agencies. Further, a pilot project is beginning with Judge Doucette in Water Division 6, whereby computer generated data regarding water court applications will be shared between the court and the Division office. This will effectively provide one stop shopping on water matters in either the court or the Division office. Finally, cooperative efforts will soon be sought on a pilot project basis with a selected county in the state, to enhance subdivision water supply review, well permitting processes, and Geographical Information System interfacing with the Division.

Of further interest, a pilot program of decentralized well permitting has been in progress since September of 1994 in Water Division 7, Durango, Colorado. The program has shown great promise for providing fast, efficient well permit application review to our customers for most of their well permitting needs. I plan on implementing this program in Water Divisions 4 and 6 during the next fiscal year.

Finally, as a result of reviews by TQM teams who examined the well permitting process I anticipate instituting new, simplified application forms for distribution to the public. While this will initially take time and involve some frustration, I am convinced that the new forms will eventually ease frustration levels of applicants, allow faster internal review, and result in higher quality customer satisfaction.

I invite you to examine these programs and others in the following pages. Our employees are constantly developing innovative ways of providing fast, friendly, efficient service to our customers and I am truly excited about the direction the Division is taking. The future looks bright, and we look forward to serving the public as we venture on to new horizons together.

Hal Simpson
State Engineer

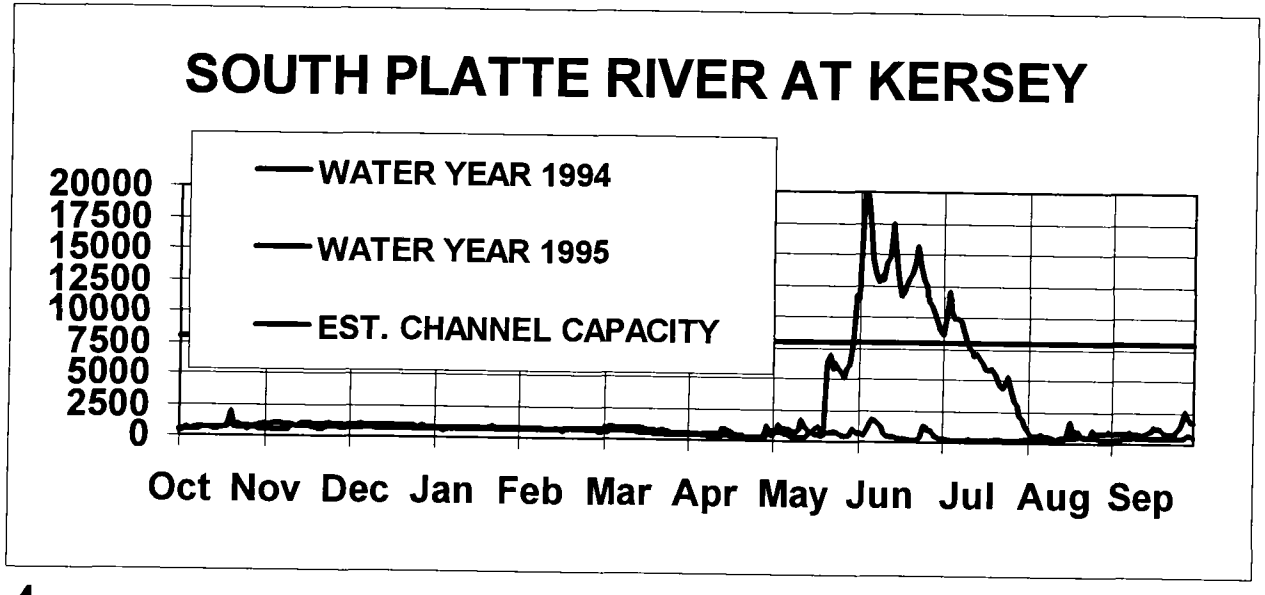
A Division of Water Resources water commissioner measures flume discharge.

◆ WATER EVERYWHERE ◆

During 1995, water supplies were questionable early in the year, but continuing late spring/early summer snowfalls changed that situation quickly. Snowfall in the mountains continued through the July 4, 1995 weekend, and it must have seemed to many citizens in Colorado thought summer would never arrive. With all of that snow, the streams, rivers and dams of the state required Division of Water Resources personnel to go into high gear.

Snowpack in some areas of the state reached record highs for late spring and early summer, with levels reaching over 400% of average. These levels were somewhat misleading in that usually there was little or no snowpack during that time of year, so any snowpack was a very large percent increase over usual levels of no snow. In reality, mother nature simply pushed back the usual snowfalls of March and April to May and June, thus delaying runoff.

With this late-season snowpack, the Division of Water Resources, in cooperation with the Department of Natural Resources, the Colorado Water Conservation Board, the National Weather Service and the Office of Emergency Preparedness, began weekly briefings through a Flood Task Force to provide information to the press and public. These briefings were crucial in providing timely information to the public as to the dangers of rising river and stream levels. To assist in these briefings, the Division's Hydrographic Branch used its Satellite Monitoring Program capabilities to the full extent to provide timely information to the citizens of the state. Emergency preparedness personnel, towns and counties were also able to rely on the system, either through computer link-up or by phone, to receive up-to-date information on stream flows during the run-off season. The Satellite Monitoring System continuously monitors stream flows via satellite link-up which relays flow information back to earth allowing for real-time measurements of stream



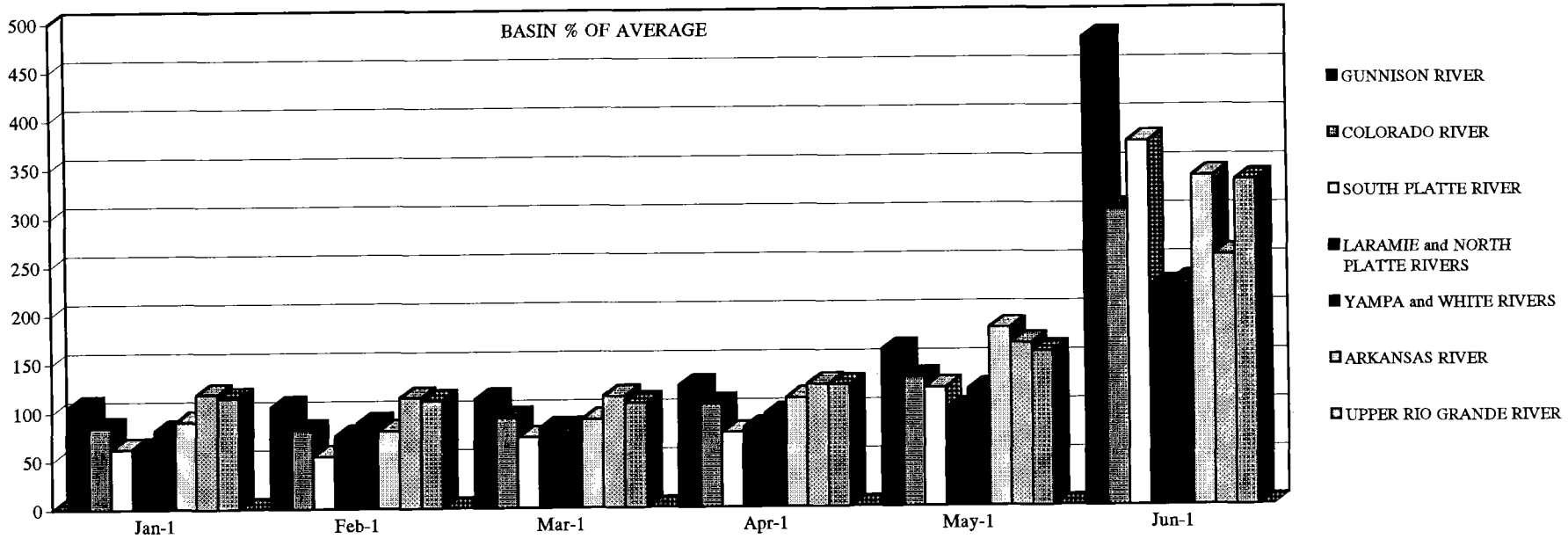
Typical hydrograph during 1995 runoff season.

flows at key gaging stations. The system also sends warning signals to the National Weather Service when flows reach heights deemed dangerous, so officials can give advance warning to citizens of possible flooding danger.

The Dam Safety Branch also played a key role during the floods of 1995. Through their decentralized dam safety program, which has safety inspectors located in each Division field office, response time on critical dams was quick, with no major incidents. Five incidents occurred during the period with only one leading to minor failure and damage. That incident involved the Town of Palisade's Vincent Reservoirs; alert action by Water Commissioner and Dam Safety Engineer Tom Brigham and John Blair averted more serious damage. After noticing the possibility of problems, they cross-country skied and snowmobiled to the reservoirs and found the spillway completely plugged from the high snowpack. They then notified emergency preparedness personnel, and over the next four days and nights, both Tom and John monitored the gradual failure of the upper dam, reviewed the hazard potential and forecasted potential peak flow and high water elevations until the emergency situation was downgraded.

During the 1995 flood season, efforts such as John 's and Tom's were the norm for the Division's water commissioners, hydrographers, and dam safety personnel throughout the state. Many other efforts, some bordering on the heroic, occurred each day. For example, the Division's hydrographers place themselves at considerable risk while measuring stream flow during the flood season. Measuring flood flows from a cable car suspended over a raging river can be most dangerous, and yet, these individuals willingly perform this important work.

Every employee played a critical role and put in many long hours to ensure the quick, reliable relay of information and the safety of the citizens of the state. The Division is truly proud of the employees who give their utmost effort during times of crisis. Our sincere thanks go out to all of these individuals who make up the heart and soul of the Division of Water Resources.



◆ PERMITS, PEOPLE & GROWTH ◆

Over the last three years Colorado has experienced significant population growth throughout the state. With this growth, increased demands are placed upon the system. The challenge becomes to offer the highest quality public service, often without increases in staff or dollars. The personnel at the Division of Water Resources are committed to providing such services by implementing new, innovative processes to accomplish given tasks on a daily basis to better serve the public.

Well permit applications during fiscal year 1994-95 increased for the third consecutive year in a row. The total number of applications filed reached 12,232. To meet this demand, the Division instituted internal prioritization programs and Total Quality Management efforts to ensure quick, efficient, user-friendly service.

Established in 1993, a Total Quality Management Well Permit Application Form Team examined the well permit application form used by the Division. The Division has used the same generic form for these applications since the 1970's. The team was charged to review the current form to lessen the impact of increased work load, facilitate the internal evaluation of the applications, and to reduce the number of applications that have to be sent back to customers because they contain errors.

During 1994, another Total Quality Management Team examined the permitting process itself. This is the largest project ever undertaken by any TQM team in the Division. The team examined every aspect of the Division's well permitting process and submitted recommendations that will result in numerous innovations

The results of these team efforts are:

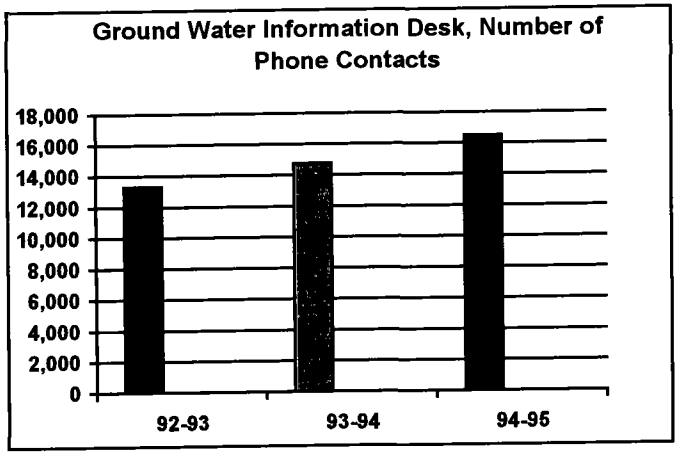
- The addition of two new E-Z type application forms specifically developed for exempt wells located on tracts of 35 acres or more (residential with limited outside use) and tracts of land less than 35 acres (household use only).
- Expanding a pilot well permitting project that has been ongoing in Division 7 (Durango area). Implemented in September of 1994, this program allows field office personnel to evaluate and issue residential exempt well permit applications instead of sending them to the Denver office for centralized evaluation. The program is designed to allow for direct customer service contact with the applicant, let personnel who are more familiar with the intricacies of their particular division have input in the process, and to issue well permits in an efficient and timely manner. The initial results of the program show great promise in providing fast, efficient well permitting application review and issuance to our customers. Due to this success, implementation in Divisions 3, 4, 5 and 6 will begin in the coming year.
- Developing policies that allow for the removal of obstacles in the internal evaluation process, with the result being the issuance or denial of a permit without constant returns of applications for further information or clarification prior to evaluation.
- Developing a pilot program with one county in the state to examine informational needs and future Geographical Information System (GIS) coordination and implementation.
- Obtaining county plat and property ownership maps for use by Denver personnel in evaluating well permit applications. Personnel will use the maps to determine the proper location of wells and verify qualifications under the presumptive rules found in 37-92-602, C.R.S.

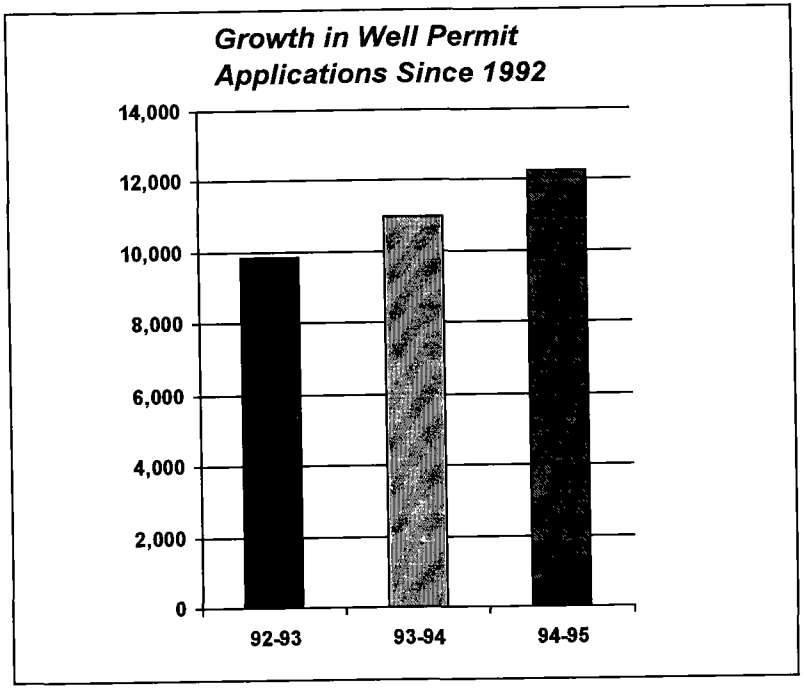
Along with the growth in permit applications, increasing public service demands have been placed upon the Division. To handle this

load, public information lines are available to handle ground water information, documentation inquiries, and emergency verbal well permit issuance. Calls to these lines have increased from 13,296 during fiscal year 1992-93 to 16,519 during fiscal year 1994-95. The Division plans to continue to examine ways to make these information lines more effective.

Increased growth has also resulted in increased public contact with the Records Section of the Division. To continue to provide quality documents to the public (well permits, diversion records and decrees), the Division made a tough decision to close the section on the last Friday of each month so that staff can use that time to maintain the documents on file. The Division feels this is a necessary step to continue providing quality historic documentation of water rights.

The employees of the Division are deeply committed to a philosophy of public service. Each employee continually examines their job and duties for areas of improvement and ways to serve the public customer in a fast, friendly and efficient manner. To assist in the employees endeavors, management is committed to unleashing the employees' innovation through programs that allow the Division to be more responsive to their needs than ever before. Open door policies, employee council, two-down management interviews and yearly supervisor reviews are just a few of the ways the Division is striving to allow the employees the freedom to take risks, and employ new programs and processes to allow the Division to provide the public the services they request into the 21st century.





◆ NEIGHBOR RELATIONS ◆

As the headwaters for the rivers that supply much of the surface water for 18 other states, Colorado is involved in numerous interstate compacts and federal decrees that govern the use of those waters across state lines. While water issues are often the source of controversy and interpretation, there are many areas where Colorado and its neighbor states cooperate on a daily basis to meet the commitments set forth in those compacts and decrees.

Platte River MOA Process

Water users in Colorado were being affected by federal government determinations that renewal of special use permits for water facilities in Colorado may have an adverse effect on endangered species that rely on Platte River habitat in Nebraska. Many of the reservoirs in this system are the primary source of water supply for northern Colorado communities. To deal with this problem, the governors of Colorado, Nebraska, and Wyoming, and the Secretary of the Interior, Bruce Babbitt reached agreement on a process to provide certainty in water supplies, protection of wildlife habitats and to assist in the prevention of listing additional endangered species on the Platte River Basin. A Memorandum of Agreement (MOA) will serve as a framework for negotiations on a basin-wide endangered species recovery plan. The states and Interior Department will conduct ongoing consultations dealing with streamflow and possible development of future water projects within the basin. All involved parties will reach a consensus on the objectives for habitats and flows needed to protect endangered species and the operation of existing water projects.

The implementation of this MOA will allow a development of a basinwide recovery plan that will provide reasonable alternatives to avoid jeopardy opinions being issued in the area. As Governor Romer stated, the "agreement will provide the basis for an innovative and forward looking effort that will be important to the residents of Colorado, Wyoming and Nebraska. It is designed to protect the interests and needs of water users along the Platte River while also finding creative solutions that will protect wildlife and preserve wildlife habitat."

Rio Grande Silvery Minnow Listed as Endangered Species

On August 19, 1994, the Rio Grande silvery minnow was listed as an endangered species in the Rio Grande Basin, adding to the number of rivers in the State of Colorado which are impacted in some way by the federal Endangered Species Act. The small minnow exists primarily in the middle Rio Grande Valley of New Mexico, between Cochiti and Elephant Butte Reservoirs in several areas including drains and ditches operated by the Middle Rio Grande Conservancy District (MRGCD).

Three issues stand out as concerns resulting from this listing. First, the U.S. Fish and Wildlife Service (USFWS) may call for flows in the mainstem during the late summer and fall, when the mainstem has historically been de-watered by diversion. The MRGDC has used a series of ditches and drains and the low flow conveyance channel to transport water through this reach in order to more efficiently and effectively deliver water to their users and to Elephant Butte Reservoir, where New Mexico's compact deliveries are measured. The instream flows would cause new losses that would affect the Rio Grande Project water supplies below Elephant Butte, interstate compact deliveries, Colorado and New Mexico entitlements under the Rio Grande Compact and, potentially, the treaty entitlement of Mexico.

Second, the listing may impact the operation of Federal reservoirs and projects upstream of the fish habitat by requiring Section 7 consultations when operations are proposed which influence the reach. This could cause increased expenses and delays on future projects within the basin.

Third, the critical habitat for the minnow is not firmly established. Because of this, there is no way to determine what reach, if any, will ultimately be selected for protection.

The Rio Grande Compact Commission unanimously voted to request the USFWS to include the Commission on the Recovery Plan Team. The Commission believes that operation of the river in the three compact states is critical and complex and it would be best to include the Commission up front to eliminate future controversy.

Biologists are preparing a draft report on the biology of the minnow. Stream flow data are also being collected, and gain/loss studies are being completed on the lower reaches of the river.

Kansas v. Colorado

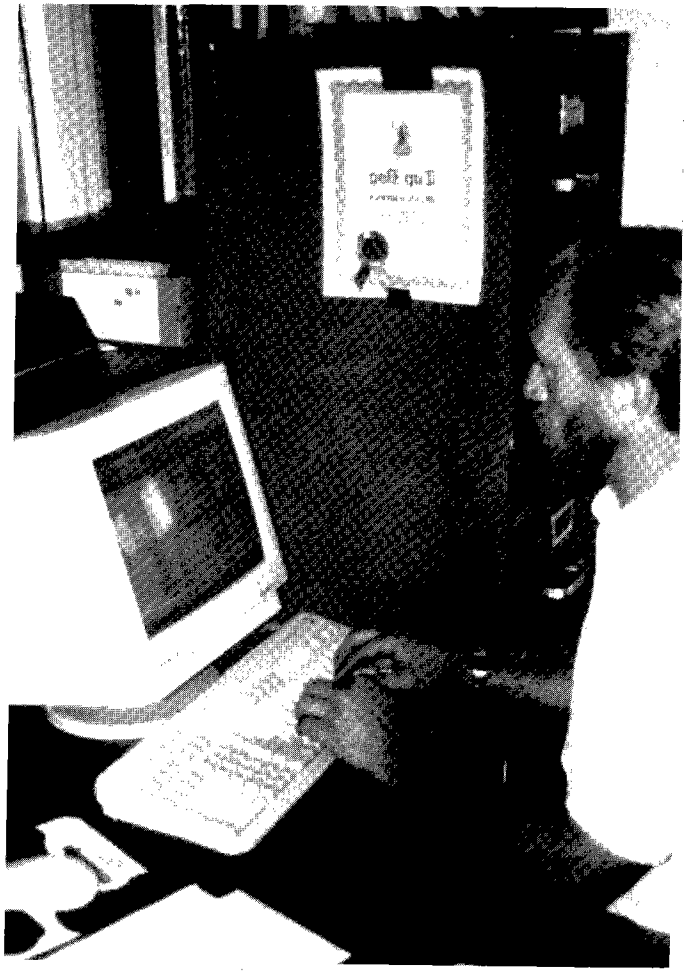
On May 15, 1995, the United States Supreme Court issued its ruling in *Kansas v. Colorado*. The court found in favor of Colorado on two out of the three issues before the court, upholding the operations of Trinidad Reservoir and the winter storage program, while ruling against Colorado as to the impacts resulting from post-compact well pumping.

As a result of this decision, numerous efforts in the Arkansas River basin are under way. A field inventory of wells has been undertaken to improve data for well administration that will be necessary to ensure post-compact well pumping in Colorado complies with the Arkansas River Compact in the future. This inventory will verify the well's existence in the field, provide an accurate location of each well, obtain the current owner's name and address, cross-reference well permit and decree numbers to the well, and tag each well site.

To improve administration of wells in the Arkansas River Basin, a data management system has been developed. This system manages the assigned numbers of each well in the basin subject to administration during the field inventory process and provides a unique identifier that links all other well information to each well.

On March 29, 1994, the State Engineer adopted "Rules Governing the Measurement of Tributary Ground Water Diversions Located in the Arkansas River Basin" (1994 Measurement Rules). These rules were effective as approved by the Court on July 15, 1994. The 1994 Measurement Rules apply to all wells located in the Arkansas River basin, with some limited exceptions. All wells within the scope of the rules must install a totalizing flow meter or have a power conversion coefficient determined. Annual reporting as to amounts of water pumped each month is also required unless a sworn affidavit is submitted on an annual basis as to the inactive status of any particular well. Totalizing flow meters are to be verified as being in accurate working condition when installed. The accuracy of such meters and power coefficients are to be reverified at least every four years. All verifications are to be completed by persons approved by the State Engineer to ensure competency.

Between July 15, 1994, when the 1994 Measurement Rules became effective, and September 11, 1995, 2,603 wells subject to the Rules in the Arkansas River basin have complied with the requirements to have a means of measuring diversions or to have affirmed an inactive well. Of these, 276 wells are reported to have installed totalizing flow meters, 1,338 wells are reported to have determined a power coefficient rating, and 989 wells are reported as inactive in 1994 (881 have been reported as inactive in 1995.) Fifty wells are either abandoned or have initiated action to change their status from irrigation type wells to purely exempt residential type uses. Data about monthly amounts of water pumped during irrigation year 1994 (Nov. 1, 1993, through Oct. 31, 1994) was received for 1,116 wells.



Brian Ahrens, Division of Water Resources ground water modeler, at work.

Enforcement of the 1994 Measurement Rules continues with additional orders being issued as information is discovered. As of September 11, 1995, approximately 700 cease and desist orders were issued to well owners addressing the non-compliance of 935 wells. As stated, failure to comply with the terms of the cease and desist orders resulted in Complaints and Motions for Injunctive Relief being filed with the Water Court regarding 156 wells. Of these, 91 wells are now the subject of court orders, 36 are the subject of pending actions, and 29 wells were dismissed from complaints due to other factors.

The efforts of the Arkansas River Coordinating Committee (ARCC), as appointed by Governor Romer, are to be commended. The ARCC includes representatives from numerous water conservancy districts, ditch associations, ground water well user groups, county commissioners and Department of Natural Resource's agencies. The committee was developed to provide advice to and coordinate with the State Engineer on the development, implementation and enforcement of rules relating to the administration of water in the Arkansas River basin, and to provide recommendations to the Governor, General Assembly, Attorney General, State Engineer, and Water Conservation Board on an appropriate remedy for past depletions to usable stateline flows. They also were to make recommendations to support efforts by the Department of Natural Resources, local officials, water owners and others to accomplish water, wildlife and recreation goals for the Arkansas River and associated reservoirs, including Trinidad Reservoir, John Martin Reservoir, and the Great Plains Reservoirs.

A key area of focus by the State Engineer to meet the requirements of the Arkansas River Compact as a result of the continuing litigation with the State of Kansas, and to protect senior surface water diverters in Colorado, has been amended rules and regulations to limit future ground water pumping in the Arkansas River Basin, absent an approved source of depletion replacement. The rules, adopted by the State Engineer on September 27, 1995, curtail all post-compact pumping along the Arkansas mainstem unless the well owner provides for the replacement of depletions to usable stateline flows and to senior surface water rights in Colorado. Wells in tributaries must also replace depletions to senior water rights on the tributary and/or mainstem.

The rules contain presumptive depletions for certain uses of ground water such as supplemental flood irrigation, sole source flood irri-

gation, and sprinkler irrigation. These presumptive depletions simplify the computations for estimating depletions. Further, the rules allow the State Engineer to compute the timing and location of depletions using the unit response function developed during the litigation with Kansas. These rules were filed with the Water Court for Water Division 2 on September 29, 1995. The effective date of the amended rules is January 1, 1996. A hearing on the proposed rules has been held, and a decision on final approval of the rules is pending.

Nebraska v. Wyoming

In this case before the U.S. Supreme Court, the states of Nebraska and Wyoming seek to enforce and modify certain provisions of the existing decree that equitably apportions the waters of the North Platte River among Colorado, Wyoming, and Nebraska. On May 30, 1995, the Court upheld Special Master Owen Olpin's recommendations to grant Nebraska and Wyoming leave to amend their pleadings to add certain additional claims and to deny them leave to add other claims. Colorado is not accused of violating the decree and would not be directly affected by any of the requested modifications. However, several of the claims could result in litigation of the amount and timing of water required to maintain endangered species critical habitat in Nebraska. Findings on these points could affect the application of the Endangered Species Act to projects on the North and South Platte rivers in Colorado. Colorado has been unsuccessful in its efforts to limit the issues to exclude these habitat issues. Therefore, the state is continuing to participate in the case to avoid a decision that would prejudice Colorado water users in other proceedings.

The trial is expected to begin on Nov. 17, 1997, and schedules for discovery and other pretrial matters are currently under negotiation. The trial will probably be held in Salt Lake City, Utah.

◆ RIVER BASIN HIGHLIGHTS ◆

Water Division 1
South Platte River Basin (Greeley)

The South Platte Water Rights Management System (SPWRMS) became fully operational within Water Division 1 during 1995. This system allows Water Commissioners direct access to flow information on an instantaneous basis via laptop computers known as Water Commissioner Toolkits. The Water Commissioners then use the computers to link up to SPWRMS and complete numerous tasks to quickly provide a limited resource to its rightful owners.

The system allows actual physical monitoring of streamflow conditions on a real-time basis and gives the Water Commissioners a tool to better manage the complex South Platte system, where major irrigation and municipal water right owners compete for an often limited supply. It also affords the water users themselves data transfer and exchange capabilities via direct access to the system, thereby easing complex accounting requirements. Further, the system allows for analysis and monitoring of water use, including administrative analysis of curtailment and allocation scenarios.

The system's first full year of use has been deemed a success. It allows the Division to make administrative decisions faster, further promoting maximization of water use on the mainstem of the South Platte. Further, the potential of the system for analysis and situation scenarios for making resource management decisions in the future appears bright, and the Division looks forward to using the system's capabilities in making the increasing complex decisions required to meet the needs of water users.

Water Division 2
Arkansas River Basin (Pueblo)

The effects of the lawsuit with Kansas dominated any and all work projects within the Arkansas River Basin. The demands being placed on staff within Water Division 2 are of an enormous nature, and their efforts are truly appreciated.

Efforts during 1995 involved enforcement of the Rules and Regulations Regarding the Measurement of Tributary Ground Water in the Arkansas River Basin. These rules require, with few exceptions, that all tributary ground water users provide information as to amounts of water diverted yearly. The first full year of implementation of the rules necessitated many enforcement actions to be initiated against well owners who refused to comply. Fortunately, most users were understanding of the situation and as a result, of great assistance to the Division in bringing about compliance.

Further efforts involved seeking input from water user groups in the Division regarding Amended Rules and Regulations Governing the Use of Tributary Ground Water within the Arkansas River Basin. Through individual and group efforts such as the Arkansas River Coordinating Committee, contact and discussion with water user groups over the implications and solutions to issues resulting from *Kansas v. Colorado* was at an all time high. These efforts resulted in the rules being adopted by the State Engineer in September of 1995, in which he attempted to take care of user concerns to the greatest extent possible. The Division Engineer and his staff are very appreciative of the user groups efforts in this realm during these difficult negotiations.

Of necessity, future focus for the Division will be promulgation of the adopted rules in the Water Court and enforcement efforts of these rules to bring about compliance with the Arkansas River Compact. These new amended rules will require diligent, conscientious efforts by staff to make the transition period from the 1973 Use Rules to the 1996 Use Rules as smooth as possible and the Division 2 staff is accepting of this challenge.

Water Division 3
Rio Grande Basin (Alamosa)

The Division Engineer for Water Division 3 continues to act as Engineer Advisor to the Colorado Rio Grande Compact Commission. He has been deeply involved in a number of issues within the Compact reach of the Rio Grande in an ongoing effort to protect Colorado's interests. In particular, issues include the effect of the Endangered Species Act and recreational interests who desire additional flows from Colorado to enhance white water rafting flows through the Rio Grande gorge. On Aug. 19, 1994, the Rio Grande Silvery Minnow was designated as an endangered species on the Rio Grande with proposed critical habitat between Cochiti and Elephant Butte Reservoirs. *(See further details in this report under "Neighbor Relations.")*

The Engineer Advisor has been involved in the additional duty of an inter-agency work group which is focusing on Rio Grande issues in Colorado and northern New Mexico. Representatives of both states, the Bureau of Land Management, the U.S. Fish and Wildlife Service, the U.S. Forest Service, the Colorado Division of Wildlife, the State Engineer's Office and Indian tribes are trying to identify and address issues of common concern, particularly involving management issues between Las Sauces, Colorado, and Espanola, New Mexico. It has proven to be extremely beneficial to educate each other as to the concerns and areas of mutual benefit for the entities involved.

Of particular pride in Division 3 have been the efforts of the Water Commissioners in District 20 (the mainstem of the Rio Grande). Steve Baer, Ben Cannon and Perry Alspaugh are making great strides in improving the administrative scheme of this complex Water District. As they gain knowledge of the river, they continuously offer suggestions for improvement of operations which have resulted in delivery of water in an increasingly efficient manner. Their efforts have also included considerable amounts of time working with water users to obtain upgraded structures and maintenance work to assist ditch owners in maximizing the use of their water.

Water Division 4
Gunnison River Basin (Montrose)

Foremost in impact to water administration and management in the Gunnison River Basin during 1995 was the release of Aspinall Unit water (Blue Mesa, Morrow Point, and Crystal Reservoirs) for the protection of four endangered fish species. Authorizing language in the Colorado River Storage Project Act, and supportive biological opinions, quantify up to 148,000 acre feet of water in the Aspinall Unit to serve as mitigated relief for accrued depletions in the Dolores and Dallas Creek Projects. Designated storage of "endangered fish waters" will be released through the hydropower generation turbines and subsequently protected against diversion from downstream water users for delivery below

Ben Cannon *(left)* and Travis Smith, Division 3.

the Redlands Power Canal diversion dam located at Grand Junction.

A forum consisting of representatives from the Division of Water Resources, the Colorado Water Conservation Board, the U.S. Bureau of Reclamation and Fish and Wildlife Service has produced a five-year interim contract for furnishing water from the Aspinall Unit for the benefit of endangered fishes. The goal of the group is to recover the four endangered species (the Colorado squawfish, the razorback sucker, the humpback chub and the bonytail sucker) while allowing water development to continue in the Upper Colorado River Basin. Release of Aspinall waters for the fish will occur during the months of July through October to alleviate low-flow conditions.

Water Division 5
Colorado River Mainstem (Glenwood Springs)

As part of the effort to recover four species of fish that are listed as in danger of extinction, the Colorado Water Conservation Board agreed to file applications for water rights to protect streamflows in the Colorado River in what is known as the "15 Mile Reach," which extends from Palisade 15 miles downstream to the river's confluence with the Gunnison River at Grand Junction. The Board filed applications for two water rights in December 1995—one to protect small baseflow intended to ensure that some water remains in the stream at all times and the other to protect peak flows that mimic the natural hydrograph during the spring runoff, which biologists believe are necessary to improve habitat for the fish.

In a related matter, an application filed with the Division 5 Water Court to adjudicate the historic Orchard Mesa check operation continued to be negotiated. (Case No. 91CW247) Issues range from wet/dry year protection of irrigation versus municipal uses, water for endangered fish species and salvage issues in the Grand Valley area. Technical advisory committees, as well as legal advisory committees, met numerous times in an effort to agree on an amount of water that could be allowed to be exchanged to maintain the historic operation of the water check back operation. While negotiations have not been completely satisfactory for all concerned, the dialogue among the parties was beneficial and may be useful towards future settlement process.

During 1995, members of the Division 5 staff continued to participate in the Surface Water Administration Team (SWAT) in that group's discussion of Colorado River administration issues. The team consists of city, county, state, and federal officials and was originally formed as a discussion group to resolve administration of Green Mountain Reservoir, but it has also tackled accounting problems associated with the Dillon Reservoir and Green Mountain Reservoir refill cases, and the Clinton Gulch Reservoir agreement. These efforts should result in minimized opposition to final decrees. Other issues are also being discussed in an expanded forum. Issues include the Grand Valley Water Management Study, Homestake/Eagle Valley "Water Trading" Plans, and the Consolidated Reservoir Operations Study.

Water Division 6
Yampa/White River Basins (Steamboat Springs)

Of major importance to the Yampa River Basin over the past fiscal year was the Colorado Water Conservation Board's (CWCB) decision to file applications for water rights to protect streamflows in the Yampa River between the Williams Fork and Little Snake Rivers near Craig, Colorado, as part of the ongoing effort to recover the four Colorado River endangered fish species. The 14-member board voted to protect a small baseflow to ensure that in most years some water would remain in the stream on a year-round basis. Further, in December 1995 they filed to protect peak flows during spring runoff, which biologists believe the fish need for spawning and migration.

Water development and environmental interest groups urged the

board to take action to fulfill Colorado's commitment to the Recovery Program for the Endangered Fishes of the Upper Colorado. Public testimony generally supported the concept of two separate water rights and the concept of ensuring that these rights would allow for at least 52,000 acre feet of additional water development within the Yampa River Basin in the future.

In a presentation to the board and public, the CWCB's staff emphasized that no existing water rights would be adversely affected by these instream flow rights and that the development allowance of 52,000 acre feet was based on extensive discussions with Western Slope representatives over the past two years to estimate future human need requirements.

Most, if not all of the water appropriated for instream flow purposes is water that Colorado is legally obligated to deliver to downstream states under the Colorado River Compact. For this reason, the impact of the instream flow appropriations will be during a time of year that water is still available to new residents and businesses in the future.

Currently, between 85,000 and 115,000 acre feet of water are used each year within the Yampa River basin for agricultural, domestic and industrial purposes. The 52,000 acre foot development allowance represents an increase of about 50 percent. Additionally, the board indicated that its final filing will also allow modification of its peakflow water right to accommodate additional development for human uses of up to 72,000 acre feet over and above the 52,000 acre-foot development allowance under certain circumstances.

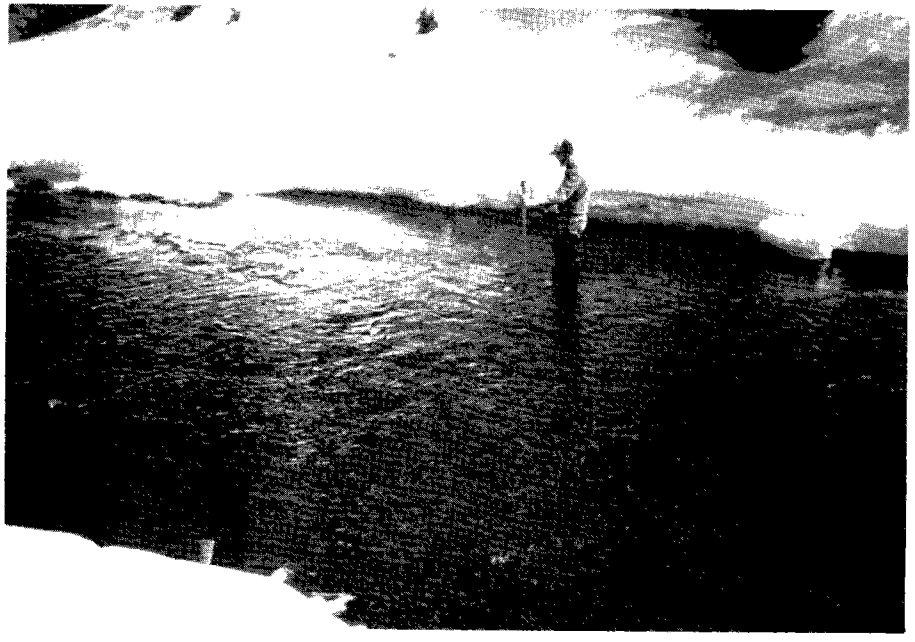
The recovery program is a unique partnership created in 1988 among the states of Colorado, Wyoming and Utah, several federal agencies, environmental groups and water development interests. Program participants have agreed to develop and implement a plan to re-establish self-sustaining populations of four fish that are protected under the federal Endangered Species Act. These four species—Colorado squawfish, razorback sucker, humpback chub and bonytail chub—are not found outside the Colorado River Basin.

A water commissioner turning a headgate.

Appropriation and acquisition of water rights through Colorado's instream flow program to preserve the habitat needed to recover the fish is critical to allowing future development of the waters of this state. By assuring that sufficient progress is being made toward full recovery of the endangered fish, the partnership agreement enables cities, irrigators and other water users to maintain existing water supplies and to develop new water projects that otherwise have difficulty meeting federal Endangered Species Act requirements.

Water Division 7
La Plata, San Juan, Dolores & Las Animas Rivers (Durango)

The Division 7 office, and representatives from the Denver office of the Division of Water Resources completed work for the Coalbed Methane Task Force in the Pine River. The Task Force was created to address public alarm over methane gas discovered in resi-



Dave Nelson, Division 7 water commissioner and hydrotechnician, measuring streamflow.

dent wells. Replacement wells were constructed by AMOCO and cessation of water withdrawals from a local gas production well were part of the solution. A permanent solution to the methane contamination in many area wells was not developed because gas production companies presented evidence that the source of the contamination was "biogenic," or originating from small localized coal formations. The companies also maintained that they were accessing the deeper Fruitland coals where water was being removed to extract the gas. However, the retrofitting of wells with aerators and release mechanisms was suggested as a possible remedy.

Other issues of note within the Division include the continuing saga of the Animas-La Plata Project. It has not been concluded as to whether the type of work needed for the Recovery Implementation Program will be sufficient to allow for continued construction of the project.

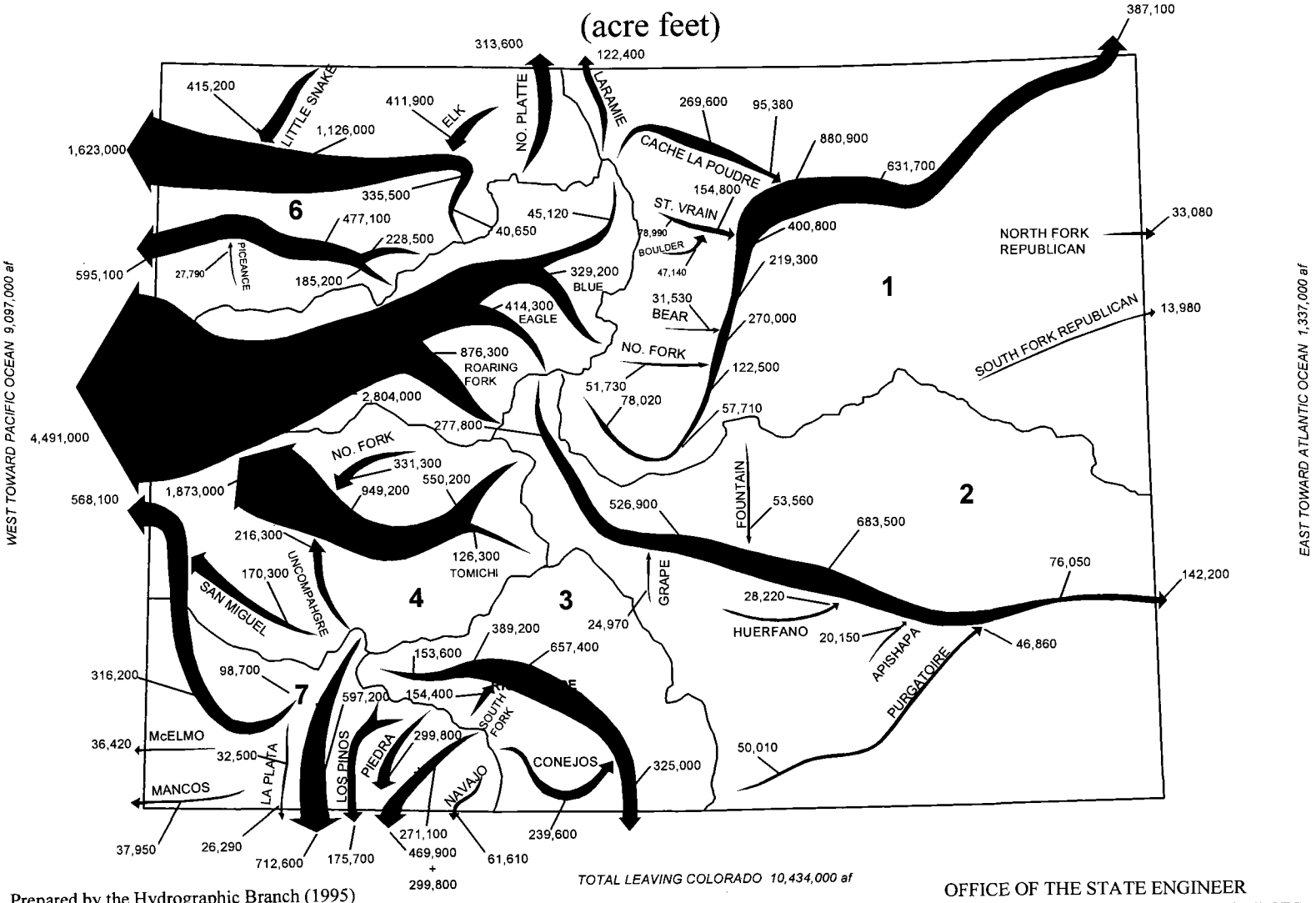
The first year of issuing exempt-type well permits from the field office in Division 7 was a success. This field office handled 347 applications as of July 13, and turn-around time on each permit varied from one to seven days. It is believed that the positives of the program far outweigh the negatives in that it provides enhanced customer service, appears to provide a shorter turn around time as opposed to centralized processing, increases the field offices awareness of well activity within the Division, and gives a sense of self responsibility in well permitting issues.

Designated Basins

The State Engineer acts as the executive director of the Colorado Ground Water Commission and provides staff and operating funds to manage ground water within the eight designated ground water basins through the commission's well permitting authority. During 1995, the Commission had several significant activities occur including amending a "three year rolling average rule" to a "three year modified banking rule," which should encourage water conservation by well users. The Commission is also examining ways to further conserve water through moving away from the concept of "use it or lose it" that has historically dominated the way water is viewed in the west.

The Commission has also adopted a metering policy allowing use of power records to compute water pumping from wells and conducted annual ground water measuring programs to forecast declining water level trends in the basins. Water needs for the cattle industry and swine industry continue to bring controversy, and areas of compromise are being sought between the industries and other ground water users.

COLORADO
HISTORIC AVERAGE ANNUAL STREAM FLOWS
(acre feet)



Prepared by the Hydrographic Branch (1995)
Historic averages obtained from USGS Water-Data Report CO-93

OFFICE OF THE STATE ENGINEER
COLORADO DIVISION OF WATER RESOURCES

◆ PUBLIC SAFETY ◆

When people think of the Division of Water Resources, they most often think of administration of water rights. However, public safety of dams and the proper construction of wells are two of the Division's highest priorities.

Dam & Reservoir Safety

In cooperation with the Office of Emergency Management, the Dam Safety Branch presented an emergency preparedness plan exercise training course during 1995. The training was held in Fort Collins with 40 dam owners and emergency managers in attendance. Plans are in the works for further training in 1996.

Presently, the branch is making a concerted effort to complete reviews of the hydrologic adequacy of spillways on existing dams in accordance with the Rules and Regulations for Dam Safety and Dam Construction. The branch has not yet begun reviews of dams above 7,500 feet, since they are awaiting results from an extreme precipitation study being completed by the state climatologist at Colorado State University with funds from the Colorado Water Conservation Board. This study will give new insight into high-precipitation flood events in mountainous areas and will provide needed information to properly evaluate the sufficiency of dams in those areas.

During 1995, the branch conducted 489 safety inspections of existing dams, 111 inspections of construction, and 162 follow-up inspections. Of the 1,817 jurisdictional size dams (over 10 feet in height), 187 are under restrictions. Plans and specifications were approved for five new dams and 21 alterations and repairs. The Branch completed six studies for hydrology purposes.

Board of Examiners

The Board of Examiners of Water Well Construction and Pump Installation Contractors ensures that ground water wells are properly constructed, that the pumps for the wells are properly installed and that wells no longer in use are abandoned and properly capped. The State Engineer provides staff for the Board and is the Board's secretary.

During 1995, the Board instituted a well notice and observation program on an experimental basis to oversee the proper construction of wells. Under this program, well contractors must notify the Division of Water Resources when and where they plan to drill a well. The Division's water commissioners then make spot checks in the field to examine the drilling and ensure proper construction.

An internal review of this program in late 1995 and early 1996 removed it as a requirement. The Board is currently considering whether to amend the rules and regulations in a manner that ensures quality well construction without the extensive manpower required to monitor the old notice and observation program.

Water Level Monitoring Program

The Division's Geotechnical Branch is in charge of an ongoing project to monitor various aquifers in the state to determine ground water trends, predict future ground water supplies and provide the ground water using community with data that will be used in determining the availability and use of ground water. Presently, the Division annually monitors a network of over 1,250 wells. Each year a water level report is published for each area and provided to well users, interested parties and agencies, and the general public.

◆ HIGH TECH ◆

South Platte Water Rights Management System

Development of the South Platte Water Rights Management System (SPWRMS) is complete, and implementation is beginning as a water administration tool that provides real-time data to assist in the daily management of the South Platte River Basin (Division 1). SPWRMS facilitates water rights administration and river management decisions in the basin through the following:

- Enhanced transfer and exchange of data between agencies and water users by providing direct user access to the data.
- Monitoring of physical conditions of the basin.
- Spatial monitoring and analysis of water use in the basin.
- Administrative analysis, such as curtailment and allocation evaluations.

Hydrobase

This is a relational and geographic database system designed in 1994. It uses current technology to store and display diversions, streamflows, water rights and well data collected and maintained by the state. The program will eventually encompass the entire state, but currently, is being applied only in Water Divisions 4-7 as part of the CRDSS project. Key components of HydroBase include: water rights, diversions, streamflows, well permits, irrigated acreage, dams, and geographical information (topology, hydrography, highways, etc.).

Colorado River Decision Support System

The Colorado River Decision Support System (CRDSS) is in the second year of a projected four-year project to develop a relational database and planning tools that will allow key water management questions on the Colorado River Basin (Divisions 4, 5, 6 and 7) to be answered. The main goal of the CRDSS is to develop credible information on which to base informed decisions concerning management of Colorado River water resources. CRDSS is being developed jointly by the CWCB and the Division of Water Resources with funds provided from the CWCB's Construction Fund. CRDSS will:

- Develop accurate, user-friendly databases helpful in the administration and allocation of waters in the Colorado River and its tributaries.
- Provide data and models to evaluate alternative water administration strategies that can maximize use of available resources in all types of hydrologic conditions.
- Be a functional system for use by decision-makers and others, and be maintained and upgraded by the state.
- Have the capability to represent current and potential federal and state administrative and operating policies and laws.
- Promote information sharing among government agencies and water users.

Satellite-linked Monitoring System

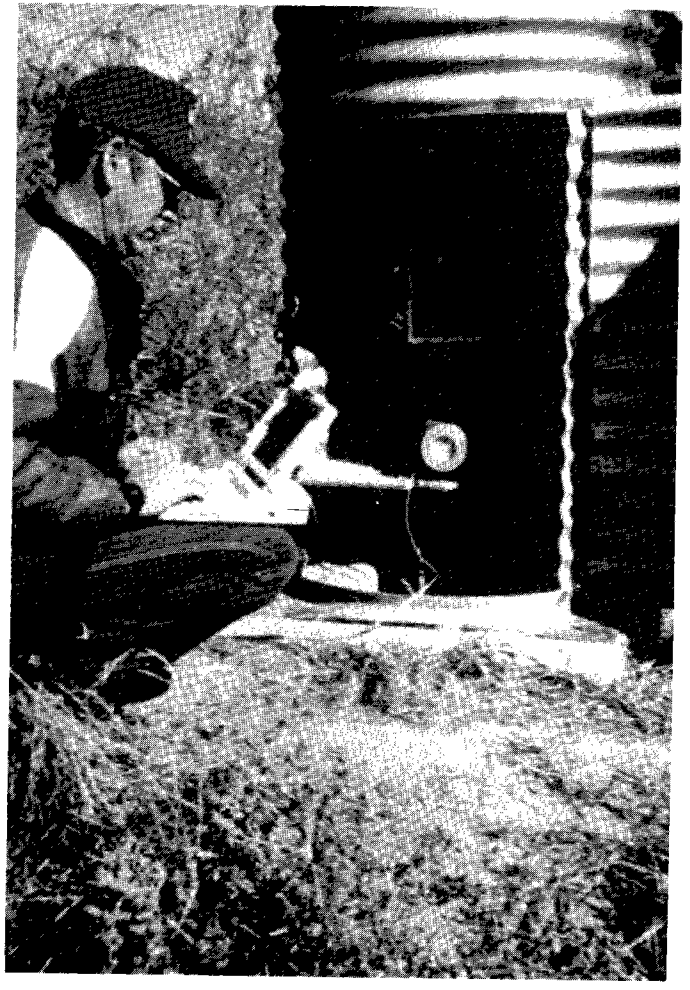
The Satellite-Linked Monitoring System (SLMS) is a program that has been in place since 1985. It now allows access to real-time and historic stream flow and diversion data from 229 gaging stations on rivers and streams across the state. These software systems provide data for more effective water rights administration, water resource management, computerized hydrologic record development and flood warning. SLMS consists of four primary sub-systems:

1. Remote station hardware that measures, collects and transmits stream flow observations to a satellite.
2. Satellite communication links and transmission receiving hardware.
3. Computer hardware and software systems.

4. Computer communication hardware and software.

A goal of the Water Conservation Board and Division of Water Resources is to integrate CRDSS, SPWRMS, HydroBase and SLMS into one statewide unified system. Conceptually, the software developed for the South Platte Water Rights Management System is to be incorporated into the Colorado River Decision Support System in year three (1995-1996) of its development. For its part, HydroBase is designed as a unified database structure that will join all data components that support CRDSS, SPWRMS, and future internal software development and water data access. This interlocking design is part of the Water Conservation Board's long range plan goals, but at this time is not funded. It is suggested, and the design allows, that CRDSS be extended to the remaining non-Colorado River Basin areas of the state in the near future.

Because of the geology of the western slope, ground water data and planning tools were not required for the Colorado River Basin. Therefore, to extend CRDSS to Divisions 1, 2 and 3, existing and undeveloped ground water data and planning models may be needed to realize a statewide "Colorado Water Decision Support System" or "CWDSS."



Russell Kennedy, Division 7 water commissioner, calibrating a data-collection platform for satellite monitoring of streamflows.

◆ SENATE JOINT RESOLUTION 94-32 ◆

The people of Colorado depend upon a continuous and reliable supply of water. Management of that supply requires consideration of many factors, including available supply, demand, conservation, preservation, compact and federal decree constraints, and drought preparedness. Considering these factors, the 1994 Colorado General Assembly passed Senate Joint Resolution 94-32. This resolution requested that the Colorado Water Conservation Board and the Division of Water Resources jointly inventory and summarize recent studies concerning Colorado's water supply and water needs.

The Division of Water Resources and the Colorado Water Conservation Board issued the report in August 1995. The highlights of that report are:

1. Development of an inventory (bibliography) of existing reports related to water supply, drought, and interstate compacts.
2. Data collection needs are significant in Water Divisions 1, 2 and 3, and ground water pumping data is needed for Divisions 1 and 3. Statewide data is also lacking.
3. Data management needs are also large in Divisions 1, 2 and 3. A statewide river decision support system similar to the Colorado River Decision Support System is currently in planning stages to address those needs.
4. Without sufficient data, development of accurate water budgets throughout the state is difficult.
5. As growth continues throughout the state, the ability to meet increasing demands and to sustain water supplies through drought periods will become difficult. Decisions on how future supply demands are met will have to be made in the near future to be able to meet demand.
6. Accurate measurement of consumptive use in the Colorado River basin is critical.
7. Most of the basins are being depleted at or near the limits established by compacts and decrees, and any remaining entitlements are projected to be consumed in the future.

Geologist Chuck Roberts uses the Global Positioning System.

◆ FORWARD ◆

The Division of Water Resources has seen many challenges in past years resulting from a rapidly increasing population coupled with demands for leaner, more efficient government, along with the ever-present competition for limited water supplies. These challenges present this Division with unique opportunities to explore innovative ways of providing the quality of customer service the taxpayers deserve. This report provides the reader with some insight into how the Division plans to meet these challenges both now and in the future.

The employees of the Division look forward to a bright future. Those efforts are detailed in the Division's Long Range Plan, which focuses on:

- ***Human Resource Management.*** *Taking care of our people and providing an exciting, educational work environment.*
- ***Technological Enhancements.*** *Providing the tools for the employees to effectively do their jobs.*
- ***Water Administration.*** *Constantly improving water resources administration and the well permitting system to improve service to the customer.*
- ***Resource Evaluation.*** *Examining the way we communicate and provide services to our customers.*

The Division re-examines its Long Range Plan on a yearly basis to ensure that the plan is meeting the mission of the Division and the needs of the customers we serve. Through this effort, and efforts outlined in this report, the Division of Water Resources believes that it is prepared for the challenges the future brings.

APPENDIX A
WATER DELIVERIES IN ACRE-FEET BY USE, WATER YEAR 1994
October 1, 1993 to September 30, 1994

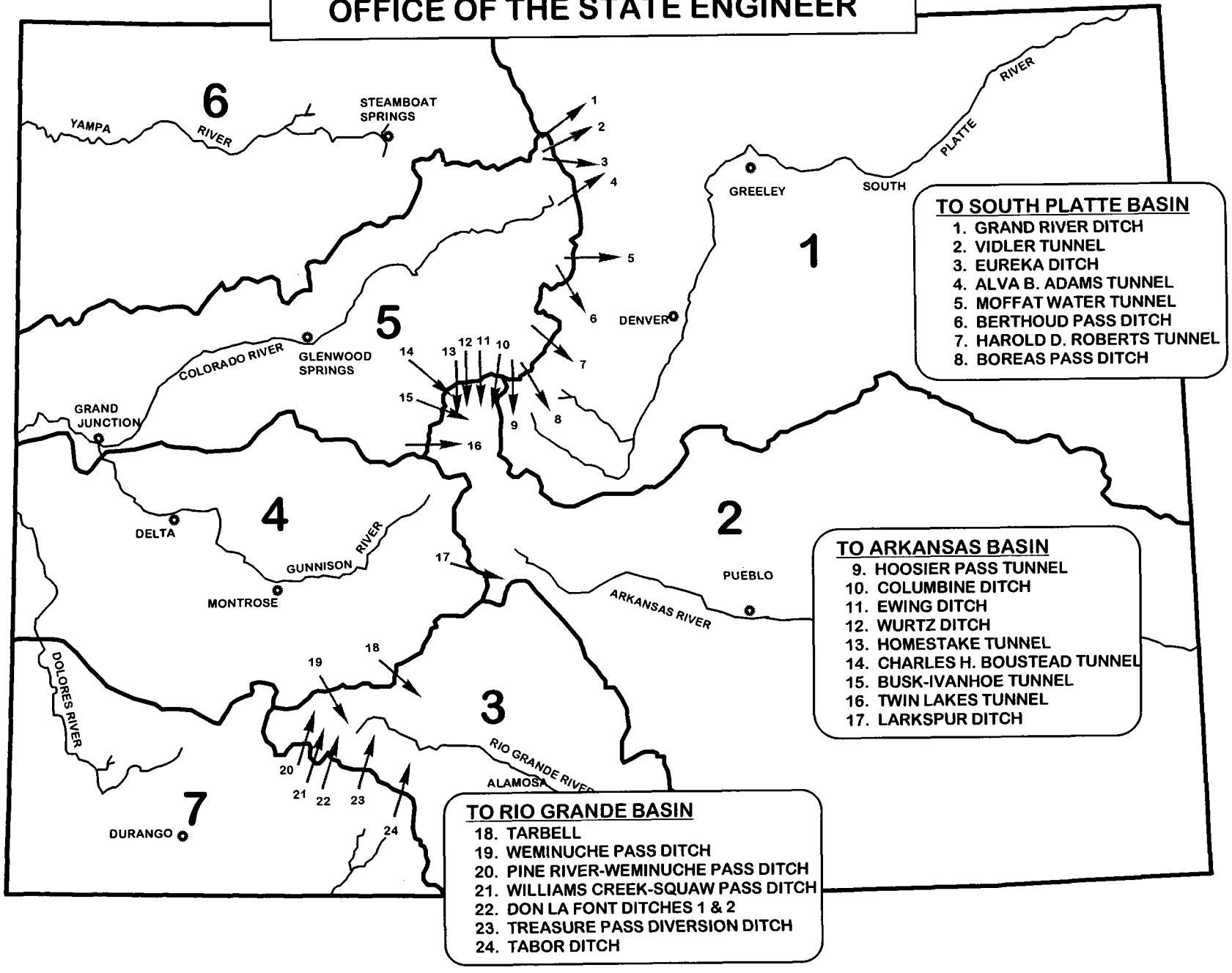
	Div. 1	Div. 2	Div. 3	Div. 4	Div. 5	Div. 6	Div. 7	Total
Irrigation	1,953,136	1,514,615	1,191,835	2,291,295	1,921,676	1,043,205	751,219	10,666,981
Storage	1,223,049	479,742	77,667	329,202	450,330	8,200	194,724	2,762,914
Municipal	487,333	142,694	8,770	13,085	56,267	3,792	13,948	725,889
Commercial	12,159	584	2,139	13,085	131	403	1,646	30,147
Domestic	10,850	6,995	7,977	648	9,050	3,416	491	39,427
Stock	183	198	849	20,100	36,856	18,494	45,787	122,467
Industrial	67,397	117,787	202	531	3,749	4,556	2,947	197,169
Recreation	3,620	20,772	954	385	6,131	485	1,098	33,445
Fish	7,656	24,529	2,883	112,817	108,693	8,858	36,992	302,428
Augment	95,042	8,317	4,671	18	280	0	172	108,500
Recharge	68,997	0	11,702	0	1	0	62	80,762
Total	3,929,422	2,316,233	1,309,649	2,781,166	2,593,164	1,091,409	1,049,086	15,070,129
Acres Irr.*	1,946,625	277,437	539,014	309,168	321,669	228,535	199,038	3,821,486

*Water user supplied data

Appendix B
Fiscal Year 1994-1995 Well Permit Activity

	Div. 1	Div. 2	Div. 3	Div. 4	Div. 5	Div. 6	Div. 7	Total	Desig. Basins	Grand Total
Exempt Received	5,385	1,736	432	534	1,005	364	591	10,047	981	11,028
Non-Exempt Received	607	172	103	46	117	16	35	1,096	172	1,268
Exempt Issued	4,321	1,054	243	366	558	223	517	7,282	789	8,071
Non-Exempt Issued	636	277	173	46	220	42	95	1,489	32	1,521
Exempt Replace Issued	490	89	47	20	31	16	24	717	105	822
Non-Exempt Replace Issued	46	13	8	0	0	0	2	69	9	78
Exempt Denied	25	15	3	17	56	0	7	123	2	125
Non-Exempt Denied	43	17	9	8	38	1	9	125	33	158
Late Register Approval	378	114	57	41	32	23	20	665	103	768
Monitor/ Test Holes	849	242	40	138	260	63	40	1,632	87	1,719
Geothermal Apps	6	1	0	0	0	0	0	7	0	7
Geothermal Issued	6	1	0	1	0	0	0	8	1	9
Totals	12,792	3,731	1,115	1,217	2,317	748	1,340	23,260	2,314	25,574

TRANSMOUNTAIN DIVERSIONS
OFFICE OF THE STATE ENGINEER



TO SOUTH PLATTE BASIN

1. GRAND RIVER DITCH
2. VIDLER TUNNEL
3. EUREKA DITCH
4. ALVA B. ADAMS TUNNEL
5. MOFFAT WATER TUNNEL
6. BERTHOUD PASS DITCH
7. HAROLD D. ROBERTS TUNNEL
8. BOREAS PASS DITCH

TO ARKANSAS BASIN

9. HOOSIER PASS TUNNEL
10. COLUMBINE DITCH
11. EWING DITCH
12. WURTZ DITCH
13. HOMESTAKE TUNNEL
14. CHARLES H. BOUSTEAD TUNNEL
15. BUSK-IVANHOE TUNNEL
16. TWIN LAKES TUNNEL
17. LARKSPUR DITCH

TO RIO GRANDE BASIN

18. TARBELL
19. WEMINUCHE PASS DITCH
20. PINE RIVER-WEMINUCHE PASS DITCH
21. WILLIAMS CREEK-SQUAW PASS DITCH
22. DON LA FONT DITCHES 1 & 2
23. TREASURE PASS DIVERSION DITCH
24. TABOR DITCH

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