

Gathering Dust

The Bureau of Reclamation's Failure to Enforce Statutory Water Conservation Requirements

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**Water Resources Program
National Wildlife Federation**

**Edward R. Osann, Director
Tom Howard and John Cain, Principal Researchers**

PREFACE

The Bureau of Reclamation, the agency charged with constructing and delivering water from federal irrigation projects in 17 Western states, has shrunk from its responsibility to reduce the waste of water and promote conservation in the arid West. In spite of a Congressional directive, a serious drought, and its 1987 pledge to improve management of existing facilities, the Bureau is not requiring irrigation districts to develop and carry out effective water conservation plans.

The current drought in the West lends urgency to water conservation efforts. Urban consumers follow water rationing and scheduling, and pay emergency prices in several metropolitan systems.¹ Even after this drought ends, population growth will continue to expand urban demands for water. Yet the age of giant water projects to meet unlimited demands has drawn to a close. The best dam sites have been taken, and developing others would be too expensive or environmentally destructive. The main components of the West's water delivery system are now in place, and its operators will have to learn to use this finite supply with greater foresight and ingenuity.

Saved water is often the least expensive source of new supplies. A mere 5% savings from the 40 million acre-feet of water the Bureau devoted to agriculture in 1987 would have yielded two million acre-feet, enough to support the domestic needs of about four million households for a year.

In 1982, after decades of controversy over the nonenforcement of the acreage limitation and residence requirement imposed on recipients of federally subsidized irrigation water, Congress passed the Reclamation Reform Act. The RRA raised the acreage limit for each recipient of subsidized irrigation water from 160 acres to 960 acres. The Act also required water districts served by the Bureau to prepare water conservation plans. The law gave the districts directions regarding the contents of such conservation plans. The plans were to contain "definite goals," "appropriate measures," and "time schedules" for compliance.

During the years following passage of the RRA, the Bureau slowly promulgated rules, regulations, and guidelines concerning conservation plans, eventually setting July 1, 1987, as the deadline for submitting them. By December 31, 1987, some 87% of the districts that were required to file

¹ The San Francisco Water Department, the Santa Clara Valley Water District, the Los Angeles Department of Water and Power, and the Metropolitan Water District of Southern California.

plans had done so, and the Commissioner of Reclamation found the results to be satisfactory. However, by February 1989, nearly 10% of the districts required to file plans still had not done so.

The National Wildlife Federation has reviewed a representative sample of these plans, and we find it difficult to share former Commissioner Duvall's satisfaction. Our review of 43 plans turned up two, perhaps three, plans that could reasonably be said to have met the basic requirements of the RRA. The rest of the plans in our sample are in varying states of noncompliance, ranging from earnest but flawed efforts down to curt off-the-cuff statements about as long as a business letter.

The National Wildlife Federation review found that the Bureau has placed the water conservation plan requirements of the 1982 Act at the very lowest level of priority during the last eight years. The Bureau has not required water districts to set quantitative goals for conservation, which alone could lend rigor to the plans, and save billions of gallons of water. The Bureau's guidelines to the districts on preparing plans confuse matters by blurring the distinction between ends and means in water conservation. The Bureau has accepted statements of good intentions in lieu of the detailed plans the RRA requires. The RRA sets out criteria for conservation plans, but the Bureau, by accepting plans that patently fail to meet these criteria, is failing to enforce the law.

The National Wildlife Federation has a special interest in water conservation, because water savings in irrigation contribute directly to preserving fish and wildlife habitat, reduce contamination from irrigation run-off and drainage, halt pressures to build new dams and diversions, and develop additional water supplies to lessen the effects of droughts.

Diversions of scarce water resources for agriculture have left important wetlands and riparian habitats without sufficient water to sustain fish and wildlife populations. Moreover, alarming concentrations of salts, selenium and toxic metal in water drained from agricultural lands across the West is poisoning remaining habitat and degrading drinking water supplies. Agricultural water conservation is considered the most cost effective means of mitigating irrigation drainage² and water supply problems.³

² M. Caswell, E. Lichtenberg, & D. Zilberman, "The Effects of Pricing Policies on Water Conservation and Drainage," *American Journal of Agricultural Economics*, November 1990, Vol. 72, No. 4, pp. 883-890.

³ Marc Reisner and Sarah Bates, *Overtapped Oasis*, Washington, DC, Island Press, 1990, pp. 112-115.

As a minimal first step toward dealing effectively with water shortages and habitat destruction, the Bureau must accept the water-conservation program envisioned in the RRA as a major element of the agency's mission. As long as irrigation water continues to be heavily subsidized, prescribed water conservation programs, not price, will be a necessary mechanism for conserving water and allocating it efficiently. Regulatory measures must do the job until the Bureau reforms its pricing, allocation, and environmental policies. If the Bureau takes steps to enforce the conservation provisions of the RRA properly, the limited water supplies of the arid West will be extended, and fish, wildlife, and people will greatly benefit. Conversely, without more effective implementation of the law, meaningless water conservation plans will continue gathering dust.

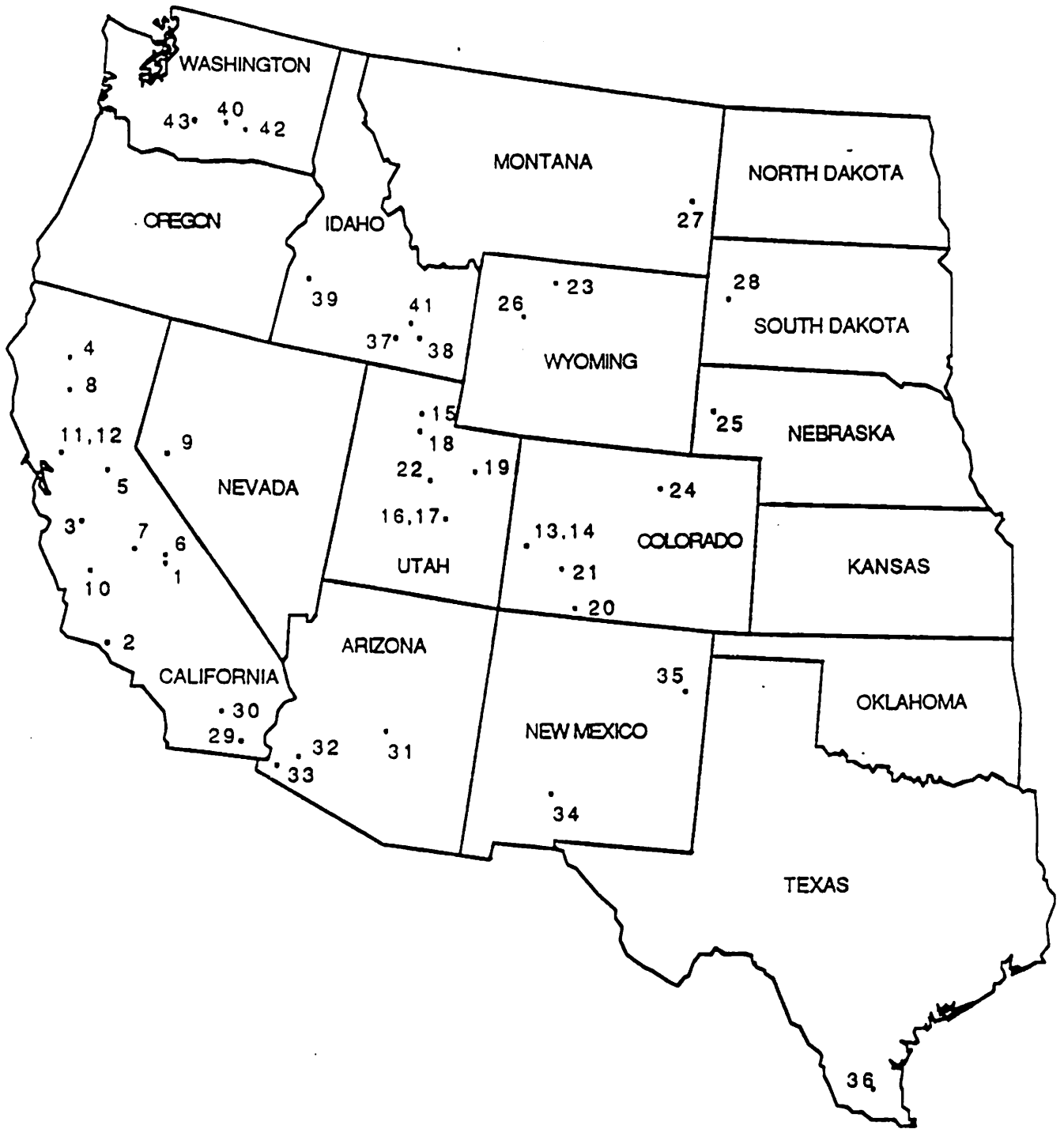
NWF recommends that the Bureau of Reclamation:

- rewrite and strengthen its water conservation requirements setting a goal of at least 10% water savings over the next ten years;
- promote markets for water that will enable its irrigation customers to profit from conservation;
- modify its pricing policies to eliminate unwarranted subsidies to irrigation water users;
- devote a portion of saved water to fish and wildlife restoration efforts; and
- apply conservation techniques to quickly reduce the threat to water quality from contaminated irrigation drainwater.

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LOCATIONS OF IRRIGATION DISTRICTS IN SAMPLE



LIST OF DISTRICTS IN SAMPLE

REGION	CONTRACTING AGENCY	PROJECT	
Mid-Pacific	1 City of Lindsay	CVP (Friant-Kern)	
	2 Carpinteria County W. D.	Cachuma	
	3 Centinella W. D.	CVP (Delta-Mendota)	
	4 Clear Creek Community Services Dt.	CVP (Shasta-Trinity)	
	5 El Dorado I.D.	CVP (Sly Park/Folsom)	
	6 Exeter I.D.	CVP (Friant-Kern)	
	7 Fresno I.D.	CVP (Friant-Kern)	
	8 Glenn-Colusa I.D.	CVP (Sacramento)	
	9 Truckee-Carson I.D.	Newlands	
	10 Westlands W.D.	CVP (San Luis)	
	11 Solano I.D.	Solano	
	12 Maine Prairie W. D.	Solano	
Upper Colorado	13 Orchard Mesa I.D.	Grand Valley	
	14 Grand Valley Water Users' Assn	Grand Valley	
	15 Ogden River Water Users' Assn	Ogden River	
	16 Ephraim Irrigation Co.	Sanpete	
	17 Horseshoe Irrigation Co.	Sanpete	
	18 Weber Basin Water Conservancy Dt.	Weber Basin	
	19 Uintah Water Conservancy Dt.	CUP (Vernal)	
	20 Pine River I.D.	Pine River	
	21 Uncompahgre Water Users' Assn	Uncompahgre	
	22 Strawberry Water Users' Assn	Strawberry Valley	
	Missouri Basin	23 Shoshone/Heart Mtn I.D.s	Shoshone
24 N. Colorado Conservancy D.		Colorado/Big Thompson	
25 Pathfinder I.D.		North Platte	
26 Midvale I.D.		Riverton PSMB	
27 Lower Yellowstone I.D.'s 1 & 2		Lower Yellowstone	
28 Belle Fourche I. D.		Belle Fourche	
Lower Colorado		29 Imperial I.D.	Boulder Canyon
		30 Coachella Valley W. D.	Boulder Canyon
	31 Salt River Valley Water Users' Assn	Salt River	
	32 Welton-Mohawk I. & D. Dt.	Gila	
	33 Yuma County Water Users' Assn	Yuma	
	Southwest	34 Elephant Butte I. D.	Rio Grande
35 Arch Hurley Conservancy Dt.		Tucumcari	
36 Hidalgo & Cameron Co. I.D. #9		Lower Rio Grande	
Pacific Northwest	37 A & B I. D.	Minidoka-Palisades	
	38 American Falls Reservoir Dt. #2	Minidoka-Palisades	
	39 Black Canyon I. D.	Boise	
	40 East Columbia I.D.	Columbia Basin	
	41 Minidoka I.D.	Minidoka-Palisades	
	42 Quincy-Columbia I.D.	Columbia Basin	
	43 Roza I. D.	Yakima	

I. IRRIGATION AND DEVELOPMENT OF THE WEST⁴

The history of the Bureau of Reclamation explains many of the reasons why it has not required irrigation districts to adopt effective water conserving measures.

Western irrigation in the 19th Century

A spokesman for the Bureau of Reclamation claimed recently that federally subsidized irrigation is responsible for much of the character of the Western U.S.⁵ The claim is partly true. It is not true, however, that the Bureau created the irrigated West. This distinction goes to the Spanish in California and the Mormons in Utah, and to their imitators in many western river valleys throughout the second half of the nineteenth century. In all the years of its existence the Bureau has brought water to eleven million acres--a large area, to be sure, but not dramatically larger than the eight million acres already irrigated through local efforts in 1902, the year the Bureau was established. Local efforts have continued; today, the 11 million acres served by Bureau water account for only 20% of irrigated land in the West.⁶

The "irrigation movement," i.e., the demand for federal support for irrigation, did not become a major political force until the very last years of the nineteenth century, and was a sign that sites for irrigation projects that would provide a return to private enterprise were already taken.

Birth of the Bureau

The Reclamation Service (Bureau of Reclamation after 1923) was established by Congress in 1902 in order to promote economic development in the arid West by expanding the area of irrigated farming.⁷ The reclamation program, it was claimed, followed in the tradition of the

⁴ Sources for Bureau history are Stanley Davidson, *The Leadership of the Reclamation Movement 1875-1902*, history dissertation, 1956, University of California, Berkeley; Mark Reisner, *Cadillac Desert: the American West and Its Disappearing Water*, 1986; Wallace Stegner, *Beyond the Hundredth Meridian*, 1982; and William E. Warne, *The Bureau of Reclamation*, 1985.

⁵ Letter from Wayne N. Marchand, Assistant Secretary of Interior for Water and Science, to Rep. George Miller, February 2, 1988.

⁶ Repetto, Robert, *Skimming the Water: Rent-Seeking and the Performance of Public Irrigation Systems*, Research Report #4, World Resources Institute, 1986, page 6.

⁷ Reclamation Act of 1902, 32 Stat. 388, 43 U.S.C. § 371 *et seq.*

Homestead Act and other legislation designed to dispose of the public land in a way that would foster family farms.

The concept that beneficiaries of a Bureau of Reclamation irrigation project must repay the costs of the project has always been basic to the program, in theory. Beneficiaries were not, however, expected to repay the interest. This subsidy, the first of many to follow over the years, was thought to be justified by the benefits that would reach large numbers of people and so spark economic development in regions of the country that would otherwise remain "unimproved." To ensure wide distribution of benefits, the law set a limit of 160 acres on the amount of land that one owner could irrigate with water from a Bureau project, and required owners to live on or near their irrigated farms. These provisions were intended to discourage land speculation and the assembly of large tracts in single ownerships.

The Bureau's early years

During its first three decades, the Bureau made an impressive record in engineering and construction. Its dams were often state-of-the-art, the largest built at that time. A term of service with the Bureau provided a kind of post-graduate education for many American engineers.

The actual utility of many Bureau structures proved less impressive. Private enterprise had already claimed the best sites, and for political reasons the Bureau was not free to choose objectively among those that were left. Because of pressures to spread its efforts evenly around the 17 Western states, projects had to be undertaken in places where the soil was not fertile enough, or the growing season not long enough, to create anything like the dreamed-of cornucopia. As discussed above, Reclamation farmers were expected to repay the capital costs of the projects serving them, although they were exempted from payment of interest, the largest part of the costs.

Widespread failure to meet the original 10-year repayment period led to the Reclamation Extension Act of 1914, which lengthened the repayment period to 20 years. Even this much time proved to be too short for many farmers. The Reclamation Project Act of 1939 granted a ten-year moratorium on any repayment, to be followed by a 40-year repayment period. Meanwhile, Congress passed several acts during periods of agricultural hard times that granted total or partial relief of debts to many projects, including Uncompahgre (one of our sample) in 1931. ---

Thus the irrigation subsidy grew and grew, becoming part of the economic underpinning of selected areas of Western agriculture. During the New Deal years, the revenues from Bureau hydroelectric projects began to be used to assist in repaying costs above the ability of irrigators to pay. This assistance was another clear indication that irrigation investment was no longer expected to pay its own way.

The Bureau and the New Deal

Franklin Roosevelt's strategy for dealing with the Great Depression was the beginning of the Bureau's golden age. Federal spending was used as a stimulant to the economy. But this time, the benefits were not tied to the return on a project as much as to the pump-priming effect of simply spending the money on it. Employing hundreds of workers on giant construction projects was thought to be a good in itself.

During the 1930's and 1940's the Bureau undertook its largest projects, such as the Central Valley Project⁸ and the Columbia Basin Project. The Bureau's boom years continued through the quarter century after World War II, when giant undertakings like the Colorado River Storage Project, the Pick-Sloan Missouri Basin Project, and the Central Arizona Project were initiated. Bureau employment peaked in 1950 at 19,261. (It is now 7,200.)

The acreage limitation debate

The Bureau took its mission to impound and divert water much more vigorously than its mission to distribute the water to promote family farming. It administered the 160-acre limit ineffectively and indifferently, allowing powerful individuals and corporations to assemble irrigated farms vastly larger than Congress had intended.

The Bureau's dereliction in enforcing acreage limitations was one of the longest-running political scandals in the West. Proponents justified irrigation subsidies with a vision of agrarian populism, to be secured by limiting the acreage that could be held by one person. One might expect, therefore, that as the subsidy was expanded, efforts to keep benefited lands in small holdings would become stronger, but the exact opposite was the case. Not only did the subsidy get bigger, but the average reclamation farm did as well.

⁸ The State of California created the Central Valley Project, but was unable to sell enough bonds to finance it. The Federal government (with Harold Ickes as Secretary of the Interior) then took it over. Reisner, *supra* note 1 at p. 10.

In 1976, National Land for People, a California family farm activist group, successfully sued the Bureau over the acreage limit. As a result, the Bureau proposed rules to enforce the limit and sell excess land at reasonable prices. Irrigation interests in California's Central Valley blocked these rules by filing a suit of their own, claiming that an environmental impact statement was required first. The maneuver backfired when the statement substantiated claims that there was widespread violation of the acreage limit in the Central Valley. All these events helped pave the way for the Reclamation Reform Act of 1982. (The content of this legislation is discussed in section III below.)

The Bureau amidst new realities

Over the period of the Bureau's existence, the nation's understanding of irrigation has changed. Despite talk of a new mission, the Bureau has been unresponsive to the economic and environmental problems associated with water in today's West.

[The] water policies and programs which fostered western development in the first half of this century are having negative effects on the region under the water scarcity conditions prevalent in the 1980's. By insulating some water users from the increasing value of the the resource, other users and potential users find it more difficult and costly to fulfill their needs. Administration of federal water projects as well as state water laws and policies not only allow an inefficient use of western water, they often ensure inefficiency by reducing or eliminating the incentives and opportunities for transferring water to higher-value uses.⁹

Urban water supplies have been tapped beyond their dependable yield in a long term drought. Consumers follow water rationing and scheduling, and pay emergency prices in several metropolitan systems.

Fish and wildlife have had to make do with less as well. Dams and diversions caused the loss of hundreds of thousands of wetlands and thousands of miles of riverine and riparian habitat. Remaining wetlands often don't receive enough water to support fish and wildlife populations at their present level. For instance, in California's Central Valley where 60% of the waterfowl on the Pacific Flyway winter, the U.S. Fish and Wildlife Service estimates that its refuges have a firm water supply of only

⁹ K. D. Frederick and J. C. Hanson, *Water for Western Agriculture*, 1982, p. 232.

9 1/2% of the water necessary for successful wintering by waterfowl.¹⁰ The fall run of the chinook salmon in the Sacramento River has been listed as endangered and the striped bass population in the Sacramento/San Joaquin Delta is at an all-time low.

Many remaining wetland habitats are being poisoned by polluted agricultural drainage. Excessive irrigation has leached a toxic brew of naturally occurring salts, minerals, and metals from the West's arid and marginal lands. This problem first gained public attention when the death of thousands of waterfowl at Kesterson National Wildlife Refuge in California was attributed to high concentrations of selenium in irrigation drainage water. Dangerous concentrations of salts, metals and other minerals are poisoning wetlands and rivers across the West¹¹ and degrading important water supplies like the Sacramento/San Joaquin Delta and the Colorado River.¹²

Contamination of agricultural water supplies with saline irrigation drainage water threatens to reduce the West's agricultural capacity. Irrigation with poor quality, saline water can reduce crop yields and in some cases render valuable agricultural lands useless for agriculture.¹³ Resources for the Future reports that an estimated 25% - 35% of the irrigated lands in the West have salinity problems, and the problems are worsening.¹⁴

An inter-agency task force commissioned to study drainage problems on the west side of the San Joaquin Valley in California identifies water conservation as a major component of its plan to manage the drainage problem.

The agencies with major responsibility for delivery of water to the study area (U.S. Bureau of Reclamation and California Department of Water Resources) should increase their work with the university extension systems and water districts to demonstrate ways to improve the efficiency of irrigation water application and thereby reduce potential drainage-water volumes.¹⁵

¹⁰ *Refuge Water Supply Investigation*, Bureau of Reclamation, March 1989, Table S-1.

¹¹ T. Harris, *The Kesterson Syndrome*, The Amicus Journal, Fall 1989, pp. 4-9.

¹² T. O. Miller, G.D. Weatherford, & J. E. Thorson, *The Salty Colorado*, 1986, pp. 8, 9.

¹³ *Id.* p. 9.

¹⁴ K. D. Frederick and J. C. Hanson, *Water for Western Agriculture*, 1982, pp. 188, 189.

¹⁵ U.S. Department of the Interior and California Resources Agency, *A management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley*.

In this context, the Bureau's focus should shift from removing more water from streams and wetlands for irrigation to managing existing water supplies to reduce irrigation drainage and increase water flows through rivers and wetlands.

II. WATER CONSERVATION POLICY BEFORE THE RRA

In its own view, the Bureau has been a promoter of water conservation since its founding in 1902. The Bureau's purpose, after all, was to "conserve" water that would otherwise, it was thought, "run to waste" in the sea or some inland sink like the Great Salt Lake. The greater part of the work of conservation was considered to be accomplished by diverting this water to the edge of farmers' fields. Efficiencies of on-farm use were left to the discretion of individual landowners.

Generally, the price the Bureau charges for water is set so low that the cost of water constitutes a small portion of the farmer's costs of production. As a result, overwatering is common. So long as water is cheap and the effects of gross overirrigation, such as waterlogging or salt accumulation, are not obvious, there is little reason to save water. On the contrary, there is a positive reason to use it, since it is by use that the landowner can most plausibly maintain a claim to water. "Use it or lose it" is the rule.¹⁶

Thus, during much of the Bureau's existence, conservation was a matter of getting water out of streams and onto fields. In more recent years the concept of conservation has undergone a fundamental change of meaning. The phrase "running to waste" has lost its force. Maintaining instream flows, estuaries, wetlands, and terminal lakes have become aims of conservation in the sense in which we use the word today, which can be summarized as beneficial reductions in water use or water losses. In its Second National Water Assessment, the U.S. Water Resources Council stated:

Irrigation is a prime candidate for water conservation because of the large quantities of water used and its concentration in the relatively water-short Western States. Irrigation accounts

¹⁶ "The incentives under this system are for an individual appropriator to utilize high applications of irrigation water merely to maintain the security of an existing water right. This practice is a significant disincentive to conservation efforts because the individual or organization that bears the costs of improving water efficiency cannot receive the benefits of or compensation for taking such measure." *Water Efficiency: Opportunities for Action*, Report to the Western Governors from the Western Governors' Association Water Efficiency Working Group, 1987, p. 68.

for 47 percent of total national withdrawals and 81 percent of consumptive use. Recent reports indicate that the potential for saving in irrigation withdrawals is from 20 to 30 percent, or a 30 to 45 bgd [billion gallon per day] savings.¹⁷

III. THE RECLAMATION REFORM ACT OF 1982

As a result of the prolonged struggle over enforcement of the acreage limit in the 1902 law, culminating in the successful National Land for People suit, Congress passed the Reclamation Reform Act of 1982. The Act raised to 960 acres the limit on the acreage in one ownership that could receive subsidized water, if recipients agreed to amend their water service contracts and agree to pay, at minimum, the annual operation and maintenance costs of water delivery. In the course of the acreage limitation debates central to the RRA, Congress added provisions to the act requiring the Bureau to promote water conservation efforts by water users.

The Law

Section 210 of the Reclamation Reform Act of 1982 reads as follows:

(a) The Secretary shall, pursuant to his authorities under otherwise existing Federal Reclamation law, encourage the full consideration and incorporation of prudent and responsible water conservation measures in the operations of non-Federal recipients of irrigation water from Federal Reclamation projects, where such measures are shown to be economically feasible for such non-Federal recipients.

(b) Each district that has entered into a repayment contract or water service contract pursuant to Federal Reclamation law or the Water Supply Act of 1958, as amended (43 U.S.C. 390b), shall develop a water conservation plan which shall contain definite goals, appropriate water conservation measures, and a time schedule for meeting the water conservation objectives.

(c) The Secretary is authorized and directed to enter into memorandums of agreement with those Federal agencies having capability to assist in implementing water conservation measures to assure coordination of ongoing programs. Such

¹⁷ The Nation's Water Resources, 1975-2000, Vol. 1: Summary, December 1978.

memorandums should provide for involvement of non-Federal entities such as States, Indian tribes, and water user organizations to assure full public participation in water conservation efforts.

The Regulations

In 1983 interim rules and regulations for implementation of Section 210 were published. The final version was published in April 1987, with few changes, despite testimony by the National Wildlife Federation and other environmental organizations pointing out the inadequacy of the interim rules. The changes from the interim version to the final version were (1) that districts have not only to develop a plan but must actually submit it to the Bureau, and (2) that conservation efforts must include municipal and industrial uses of water. (Some districts that have contracts with the Bureau provide large amounts of water to municipal and industrial uses.)

The final regulations read as follows, with 1987 additions underlined:

(a) *In general.* The Secretary shall encourage the full consideration and incorporation of prudent and responsible water conservation measures in all districts and for the operations by non-Federal recipients of irrigation and M & I (municipal and industrial) water from Federal Reclamation projects.

(b) *Development of a plan.* Districts that have entered into repayment contracts or water service contracts according to Federal Reclamation law or the Water Supply Act of 1958, as amended (43 U.S.C. 390b), shall develop and submit to the Bureau of Reclamation a water conservation plan which contains definite objectives which are economically feasible and a time schedule for meeting those objectives. In the event the contractor also has provisions for the supply of M & I water under the authority of the Water Supply Act of 1958 or has invoked a provision of that act, the water conservation plan shall address both the irrigation and M & I water supply activities.

(c) *Federal assistance.* The Bureau of Reclamation will cooperate with the district, to the extent possible, in studies to identify opportunities to augment, utilize, or conserve the available water supply.¹⁸

¹⁸ 43 C.F.R. 426.19 (1987).

The rules and regulations do little to explain the law, and in fact distort it in three ways:

1) The rules confuse the responsibilities of the Secretary and those of the districts. There are two distinct and different parts of Section 210 of the RRA, one directing the Secretary of the Interior to do certain things (subsection (a)) and the other directing irrigation districts in the West to do certain things (subsection (b)). To say, as the rules and regulations do, that the RRA requires districts to file conservation plans where the objectives are economically feasible, is to mix elements, one from section 210(a) and another from section 210(b). The law requires the Secretary to encourage water conservation where such measures are shown to be economically feasible for such non-federal recipients.

This confusion between Subsections (a) and (b) of the law led the rules to ignore the water conservation responsibilities that the Secretary has under all existing laws. Subsection 210(a) of the RRA requires the Secretary to exercise "his authorities under otherwise existing federal Reclamation law to encourage the full consideration and incorporation of prudent and responsible water conservation measures . . ." The preparation of the rules represented a missed opportunity to describe, explain and consolidate existing responsibilities and authorities of the Secretary pertaining to water conservation.

2) The regulations blurred the distinction between "goals" and "measures" in section 210(b) into "definite objectives." The law refers to "where such measures are . . . economically feasible." The rules refer to objectives. This error paved the way for even deeper confusion in the Bureau's *Guidelines* described below.

3) Whereas section 210(c) of the RRA is concerned with the Bureau's cooperation with other agencies, federal and non-federal, on water conservation alone, subsection (c) of the regulations added the words "augment" and "utilize" to "conserve." The RRA directs the Bureau to cooperate with districts in conserving the available water supply, not in augmenting it. Because the Bureau's proclaimed "new mission" is to move away from augmenting the water supply toward conserving the supply that already exists, this is an especially inconsistent distortion of the law.

The National Wildlife Federation called the attention of the Bureau of Reclamation to the inadequacy of its rules and regulations. Representatives of NWF commented on proposed rules and regulations in 1983 and 1987, pointing out both times that these rules and regulations should contain minimum criteria for an acceptable plan, timetables for

plan development and implementation, examples of acceptable conservation actions, sanctions for non-compliance, and provisions for plan enforcement by the Secretary of the Interior or by aggrieved persons and states and agencies. The Bureau ignored these comments.

The Guidelines

In January 1985, the Bureau of Reclamation issued *Guidelines for the Development of Irrigation Water Conservation Plans*, to help the Bureau's regional offices in implementing section 210(b) of the 1982 RRA. A cover letter from Acting Reclamation Commissioner Robert A. Olson reminded regional directors that former Commissioner R. Keith Higginson, on July 17, 1979, had advised them that all future repayment and water service contracts would include conservation provisions. Standard language for these contracts included the following:

[The] water conservation program shall contain definite goals, appropriate water conservation measures, and time schedules for meeting their water conservation objectives.

This language is almost identical with that in section 210(b) of the 1982 law, quoted above. Commissioner Olson's cover letter went on to say that water conservation plans were to be reviewed by the Contracting Officer at five-year intervals after execution of the contract, and added,

Given the similarity in requirements between our 1979 policy and the Reclamation Reform Act, each region should have already reviewed and approved district/contractor water conservation plans developed pursuant to provisions of contracts signed since 1979. Some regions may already have completed the 5-year review required. In effect, our current policy and procedures should meet requirements of the Reclamation Reform Act.¹⁹

It appears, then, that the Bureau interpreted the water conservation provisions of the 1982 Act to be a mandate to continue what it was already

¹⁹ Letter from Acting Reclamation Commissioner Robert A. Olson to Regional Directors, July 17, 1979, p. 3.

doing. This interpretation can be seen also in a later statement by former Interior Secretary Donald Hodel, as follows:

. . . All new and amended contracts contain a standard water conservation article that reflects Reclamation policy in effect since 1978. That article requires development of a water conservation plan consistent with the requirements of section 210 of the Reclamation Reform Act of 1982, which requires the development of water conservation plans where such measures are shown to be economically feasible.²⁰

In addition, Secretary Hodel's statement perpetuated the misrepresentation in the rules and regulations implying that conservation plans are to contain only economically feasible measures.

We have seen that the rules and regulations contained less reliable guidance for irrigation districts than the law itself. This means that the 1985 *Guidelines* were the major source of advice to districts in preparing conservation plans. It is therefore worthwhile to look at some of the provisions of this document.

A good introduction must include a general description of the district. This would include a map of the service area with all facilities, a discussion of its history; a description of the water supply sources; and a listing of the crops, soils, acres, and climate factors.

After the introduction, the order of the chapters could be system inventory, problem areas, conservation goals, selection of corrective actions, implementation arrangements and time schedules, technical assistance, and evaluation procedures to determine if goals have been achieved. Additional chapters can be added as needed, and appendixes are probably necessary. The appendixes could contain delivery efficiencies of individual canals, calculations of costs and benefits, references to other reports, district rules and regulations, and definitions of terms used in the chapters.²¹

The *Guidelines* recommended that the plan include an evaluation of benefits and costs, bearing in mind that these do not always accrue to the same parties.

²⁰ Letter from Secretary Hodel to Rep. George Miller, Chairman, Committee on Interior and Insular Affairs, U.S. House of Representatives, May 16, 1988.

²¹ *Guidelines*, page 9.

Benefits include savings of water, energy, fertilizer and labor as well as improved water quality, reduced drainage costs, and improved crop production. Costs include the labor, construction and management costs on nonstructural changes.²²

It can be seen that the writers of the *Guidelines* expected a conservation plan to be a rather substantial document. Very few conservation plans examined for this report come anywhere near the level of comprehensiveness suggested by these *Guidelines*.

Even following the *Guidelines* would not necessarily have led to the development of sound conservation plans. Indeed, a fundamental flaw of the Bureau's conservation program seems to originate in the *Guidelines'* discussion of goals and measures to meet goals. Examples of goals are given as follows:

. . . installing measuring devices at all farm turnouts, converting open ditches to buried pipe, computerizing some district operations, conducting educational programs for water users, improving district-wide irrigation efficiencies to a certain level, or reducing energy consumption by a certain percentage.

After goals have been established, districts are to select appropriate corrective actions.

Some examples of corrective actions may be the purchase and use of a computer to improve record management during the first year, replacing 5 miles of ditch laterals with buried pipe each year, changing to an increasing block rate pricing system after installing all water meters, setting appropriate water allocations each year, installing 25 water measurement devices each year, concrete lining 3 miles of a canal each year, or retaining a private consultant to further study a problem in a future year.²³

These lists of "goals" and "actions" occur within a few lines of each other in the *Guidelines*. The reader is challenged to divine the logic that governed the placement of an item in one list rather than the other! There is a fundamental confusion here between means and ends, or "measures" and "goals," to use the Bureau's usual language. This confusion pervades

²² *Guidelines*, p. 4.

²³ *Guidelines*, pp. 5, 6.

Bureau efforts in conservation, and has enfeebled most district conservation plans submitted to the Bureau.

A goal is the end of an undertaking, the destination to which efforts are to lead. Measures are the various ways in which that destination may be reached. In the case of water conservation plans, the goal must be to conserve water and to achieve benefits related to water conservation. A goal can be expressed quite briefly, as a certain quantity of water to be conserved. The measures may take more room to set forth, since there are many possible measures that may be more or less appropriate to a local situation. The Bureau's blurring of the distinction between goals and measures allows the districts to take the easy way out in developing weak plans. If any progress is to be made in water conservation, the two terms must be clearly defined. The Bureau has continued to confuse them in its own *Guidelines* for districts.

Evaluation and monitoring criteria

A 1989 Bureau policy memorandum provided additional guidance for the Bureau's Regional Directors to evaluate the water conservation plans, but continued most of the errors of the *Guidelines*.²⁴ It required water conservation plans to contain "more than one definite goal or objective," but again confused measures with goals, listing "increased accuracy in recordkeeping" and "increase cooperation with other local districts and state entities" as acceptable water conservation goals. Furthermore, the limited requirements of the policy that the plans contain time schedules for implementation and that acceptable plans be submitted before contracts can be renewed are meaningless if these requirements are not enforced by the Bureau. As discussed in Section V. below, NWF's review revealed that the Bureau has not enforced even the minimal standards it has set for acceptable conservation plans. And the Bureau has never set a standard requiring actual implementation of the plans.

The Bureau's interpretation of the scope of section 210(b)

Under the Bureau's interpretation of 210(b) there are some categories of districts that do not have to develop water conservation plans.

1) According to a memorandum to the Regional Director in the Mid-Pacific Region from Acting Commissioner Clifford I. Barrett,²⁵ "practicality and common sense dictate that in certain situations elaborate water

²⁴Memorandum from Acting Commissioner to Regional Directors, Oct. 31, 1989.

²⁵ Interior Dept. reference number 426.19-0003, Dec. 11, 1985.

conservation plans are simply inappropriate." The memo goes on to specify two types of such situations: (1) temporary contracts of one year or less, and (2) contracts with individuals and small entities, where small is defined as 2000 acres or less served with Bureau water. This definition ignores the potential for leveraging the total water use of these districts with Bureau water conservation. The memorandum also exempts cases involving a number of small contracts even if the total acreage served by the distribution system exceeds 2,000 acres.

In the Pacific Northwest Region, 24 districts of fewer than 2000 acres each, totalling 25,000 acres, are exempt under this provision. An additional ten districts between 2000 and 3000 acres each have been exempted at the regional director's discretion. Thus it would seem that something on the order of 50,000 acres in the Pacific Northwest region alone were not required to file conservation plans under the small district exemption.

2) A memorandum dated October 31, 1986, from Reclamation Commissioner Dale Duvall exempted from the water conservation requirements of section 210(b) those districts that are subject only to contracts with the Small Reclamation Projects Act (SRPA) and the Water Conservation and Utilization Act (WCUA).²⁶ This resulted from a decision by the Department of the Interior Solicitor that both the SRPA and WCUA are separate and distinct from the general core of federal Reclamation law. SRPA authorizes subsidized loans to certain irrigation districts, which do not receive water from the Bureau. WCUA provides for the construction of small irrigation projects, subject to separate repayment provisions. The memorandum also exempted some Bureau customers who are covered by water service or repayment contracts and are receiving water under the Warren Act, which provides for the sale of excess water available from Bureau projects.²⁷

3) The Bureau exempts some districts from the conservation requirements because of pre-existing water rights. For example, the Central California Irrigation District is deemed exempt because the water conveyed to it via the Delta-Mendota Canal fulfills the district's pre-existing San Joaquin River water rights, acquired in the 1870's. When the Central Valley Project diverted the river upstream at the Friant Dam, it was legally obliged to replace the water. It did this by conveying water via the Delta-Mendota Canal to a point on the San Joaquin above the headworks of the

²⁶ Letter from William C. Klostermeyer, Assistant Commissioner of Reclamation, to Edward R. Osann, April 22, 1988.

²⁷ Memorandum from Associate Solicitor Keith Eastin to the Commissioner of Reclamation, August 28, 1985.

Central California and other irrigation districts. This water is thus construed not as a CVP delivery but as a replacement for water diverted upstream.

4) The Bureau and the U. S. Army Corps of Engineers have competed for projects in some parts of the West, and the resulting arrangements are sometimes rather complex. Corps projects are exempted from the Reclamation Reform Act under section 212(a). The exemption does not, however, include projects that are made a part of, or integrated with, a Bureau project.²⁸ For example, Fresno Irrigation District, with 162,202 irrigated acres, which receives most of its water through Corps projects on the Kings River, also takes some Bureau water (29,051 acre-feet in 1986) and therefore filed a conservation plan. In addition, the Bureau administers water service contracts for Corps projects, for example, the Kings River and Kern River Projects in California. The Bureau apparently considers such projects to be exempt under section 212(a).

5) In one important regard, the Bureau has reversed itself on the question of which districts are required to file conservation plans. Some districts, called paid-out districts, have repaid, usually over a period of many decades, the construction costs of the projects the Bureau built for them. The Bureau initially decided that paid-out districts were exempt from 210(b), on the grounds that, having fulfilled their obligations to the federal government, they were not subject to laws enacted later.

On October 31, 1986, however, Commissioner C. Dale Duvall notified regional directors that paid-out districts were not after all exempt from conservation plans.²⁹ This is noteworthy, because districts that have been in existence long enough to have completed a pay-back period are found in older Bureau project areas. They are thus more likely to have obsolete facilities, and, as a group, could probably benefit more from conservation measures than other districts. Paid-out districts in our sample of 43 include Lower Yellowstone, Pathfinder, and Truckee-Carson.

We find it hard to form an accurate estimate of the total amounts of land and irrigation water that are exempted from conservation reporting through the provisions discussed above, but we believe they comprise between 10% and 20% of the total land served and water delivered by the Bureau. There are some 3,000 entities contracting for water from the Bureau, but only 884 were required to submit conservation plans. Many

²⁸ Reclamation Reform Act § 212 (a)(1), 43 U.S.C. § 3901 l(a)(1).

²⁹ Memorandum from C. Dale Duvall to Bureau of Reclamation Regional Directors (October 31, 1986).

of the remaining 2,100 are quite small, less than 100 acres in some cases. The National Wildlife Federation sample of only 5% of districts required to report accounts for 36% of the Bureau's service area. Our assumption is that most of the Bureau's total service area is subject to the conservation reporting requirements of section 210(b). In some areas, however, large amounts of irrigated land may have been exempted.

Response of the districts

When the Bureau sent the *Guidelines* out to the regional offices in January 1985, it set July 1, 1987, nearly five years after the enactment of the RRA, as the deadline for districts to submit conservation plans. The degree of compliance by districts seems to have satisfied the Bureau. In response to questions from the House Appropriations Committee at a hearing on February 22, 1989, Commissioner Duvall presented the following summary statistics.³⁰

STATUS OF WATER CONSERVATION PLANS

Region	Plans Expected	Plans Submitted	Plans Accepted
Pacific Northwest	135	100	99
Mid-Pacific	319	280	275
Lower Colorado	75	75	68
Upper Colorado	47	46	39
Missouri Basin	308	308	308
TOTAL	884	809	789
Percentage of total	100	91	89

³⁰ *Energy and Water Development Appropriations for FY 1990: Hearings before the Subcommittee on Energy and Water Development of the House of Representatives Committee on Appropriations, 101st Cong., 1st Sess., p. 705 (1989) (Commissioner Duvall's response to questions submitted by the Hon. Silvio O. Conte).*

The table's conclusions provide an interesting background to our own findings. The Bureau received conservation plans from 92% of the districts that were required to file them, and accepted 98% of these. It seems fair to say, judging from these figures, that the Bureau was satisfied with the way contracting districts complied with the water conservation plan requirements of the RRA. In contrast, NWF sees little evidence for complacency in the Bureau's slow pace in developing regulation to implement the RRA water conservation provisions, and in the large number of exemptions that the Bureau has carved out administratively.

The low priority assigned to implementation of section 210 of the RRA by the Bureau is doubly disappointing because in 1987 the agency issued a new mission statement. *Assessment '87* found that the Bureau must change its primary orientation from one based on federally supported construction to one based on effective and environmentally sensitive resource management. "More attention is being given to alternative means of supplying water through improved system management, joint use of surface and groundwater supplies and reevaluating priority of use. Conservation of water and protection of the environment are major public concerns."³¹ However, the Bureau's actions do not support the conclusion that the Bureau shares the public's concern and urgency that water conservation is and should be a high priority.

IV. NWF'S REVIEW OF SELECTED WATER CONSERVATION PLANS

As we have just seen, the Bureau of Reclamation has determined that 884 districts must submit water conservation plans. Our present report is based on a review of 43 plans, summarized in Table I. We selected these districts with a view to representing a wide range of district size and a broad geographic coverage of the 17 states served by the Bureau of Reclamation. Our sample contains only 5% of the plans but covers 36% of the land served by the Bureau and 37% of water delivered to farmers.

These plans vary enormously in quantity and quality. A few districts took the conservation plan requirement seriously, while most districts evidently regarded it as a mere formality. A rough indication of this variation is given by the number of pages in each plan, as shown in Table I. The number of pages in a report is not necessarily an indication of its value, but the references to "chapters" and "appendices" in the *Guidelines* make it clear that a substantial document was envisioned. It is hard to see how a district could produce a serious plan in fewer than ten pages. But if our

³¹ *Assessment '87 ... A New Direction for the Bureau*, Bureau of Reclamation, Washington, DC, 1987, p. i.

sample is representative, it looks as though a large number of districts have submitted documents even slighter than this. A number of plans consist of nothing more than a few typed pages. For example, the reports from the Uncompahgre Water Users' Association (Colorado) and Pathfinder Irrigation District (Nebraska), using 278,000 acre-feet and 191,000 acre-feet of water respectively, consist of three pages each. Minidoka Irrigation District (Idaho), which uses 455,000 acre-feet, weighed in with one-and-a-half pages.

At the opposite extreme is Imperial Irrigation District's massive report, which is one of the few that appears to meet the requirements of the law. The completeness of Imperial's report, however, was stimulated not by Bureau enforcement of section 210(b) but by the California Department of Water Resources' 1981 finding that water was being wasted in the Imperial Valley. Hearings by the California Water Resources Control Board in 1983 led that body to issue an order for the Imperial Irrigation District to develop a water conservation plan. This episode illustrates both that it is possible for an irrigation district to produce a good conservation plan, and that it may require vigilance and vigor by regulatory bodies to make sure the job is actually done.

The Bureau's indulgence, on the other hand, tempts districts to do as little as possible. Solano Irrigation District submitted a minimal plan in 1985. Five years later, however, Solano's updated plan, the only one in our selection updated to date, was nearly identical to the 1985 plan. The majority of the text had been repeated verbatim from the 1985 plan, including time frames and work accomplished. Thus, conservation measures that were to be implemented within 10 years of 1985 are now planned to be implemented within 10 years of 1990. The district managers had apparently gotten the message that the plans were nothing more than a formality. The Mid Pacific Region of the Bureau agreed; they approved the 1990 plan.

It is not necessary to produce a book-size volume to comply with the RRA, however. The Roza Irrigation District (Washington) did a creditable job in 75 pages, although part of this district's plan was actually prepared by the Northwest Region of the Bureau. The El Dorado Irrigation District (California) presented a good plan in 34 pages--at least partly, it would appear, because of ten years of cooperation in water conservation activities with state and federal agencies.

NWF's analysis is summarized in Table I. The four columns labelled quantitative goals, specific measures, timetable, and budget, highlight the

key features of these plans and their degree of compliance with the conservation requirements of section 210(b). The results are as follows:

Goals. Some estimate of actual amounts of water to be saved is essential to any serious water conservation plan. And by this criterion the plans are, as a group, unimpressive. We put a "yes" in this column if the plan contained *any* reference to amounts of water that might be saved. For example, the Coachella Valley Water District plan notes in passing that the district loses 30,000 acre-feet annually and proposes to reduce the loss by canal lining. It gets a "yes" in the quantified goals column. Even by this liberal interpretation of quantification, only 11 out of the 43 plans in our sample say anything about the amounts of water that might be saved.

Measures. All but five of the plans in the sample did cite specific measures for conservation. To get a yes in this column a district had only to propose *some* specific measure that might have something to do with saving water. Even a routine reference to canal lining would do. Still, five districts got a "no."³²

Timetables. Any statement about a particular date for the completion of proposed measures was enough to get a yes in this column. Still, only 22 of the 43 plans contained even this.

Budgets. The budget column does not relate to an explicit provision of section 210(b). We believe, however, that any serious conservation plan would require some discussion of how proposed conservation measures would be financed. Only 16 districts in the sample met this criterion.

Final Grade. Even with our very lenient criteria, we could have approved (i.e. given four "yes's" to) only nine out of the 43 in our sample, a pass rate of 21%. It should be emphasized that we were quite generous in reviewing these plans. If we could find anything to justify a "yes" in one of these four columns, even if it was no more than an isolated phrase or sentence, we entered a "yes." Thus a plan that got four "yes's" is not necessarily a good plan; it is simply better than most that were submitted. It is not plausible that the Bureau reviewed these plans carefully, or it would never have passed 98% of them.

³² The districts expressed good intentions to save water, but one (Pine River Irrigation District in Colorado) claimed that it lacks the authority to enforce any conservation measures at all.

V. FINDINGS OF THIS REPORT

Absence of quantified goals

The *Guidelines* define water conservation as "the beneficial reduction in water use or water losses." Beneficial reduction is directly related to irrigation efficiency, which is defined by the *Guidelines* as "the ratio of the quantity of applied water used in crop evapotranspiration and the leaching requirement to the total quantity of diverted water." Irrigation efficiency can be measured at a variety of scales, but for the Bureau's purposes, "the season-long, district-wide irrigation efficiency is the most important measurement of how the district manages its water."³³

Since the goal of conservation plans is to achieve such a beneficial reduction in water use or losses, the way to evaluate a plan is to ask how much water it proposes to save, and how realistic the proposed measures are likely to be in achieving that goal. In our view, *the fundamental flaw of these conservation plans is that they do not formulate goals in terms of actual amounts of water to be saved, either in acre-feet or as a percentage of current use.* Unless a district commits itself to some specified measurable performance goal, its conservation plan is not likely to be worth much.

Confusion between goals and measures

Instead of proposing quantified goals, most plans in the sample propose what are actually measures, and then call them goals. Metering turnouts, lining canals, installing pipe, holding seminars and workshops for ditch riders and landowners, etc. are given again and again in these plans as conservation goals, but in fact *these are measures that can be taken to achieve goals, not goals in themselves.*

Meters can be installed, but with the subsidized price of water as low as it is in some districts, meters may have little effect on the amount of water used. A concrete-lined canal will lose less water to seepage than an unlined canal in the same place, but that amount will vary widely according to climate and soil type, and may not contribute significant net savings if there is groundwater pumping in the district. Ditch riders may sharpen useful skills and pick up much valuable information at workshops, but this does not necessarily mean that their districts will conserve more water.

³³ All quotes in this paragraph are from page 3 of the *Guidelines*.

The basic problem with measures masquerading as goals is that they can't lose. If a district proposes metering a certain number of turnouts every year as its conservation goal, and then meters that number of turnouts, it will have met its conservation goal, whether or not there was any significant beneficial reduction in water use or water losses, and despite the possibility that some other measure might have been much more effective.

In our opinion, the failure of district plans to make a clear distinction between means and ends can be laid at the feet of the Bureau of Reclamation. As we noted in discussing the instructions that the Bureau sent out to districts (section III above), the Bureau's *Guidelines* define goals in a way that defeats clear thinking on conservation right from the beginning.

Routine maintenance presented as conservation

Many districts compound this confusion by proposing as conservation goals those actions that are basically routine maintenance chores. Clearing weeds from canals, removing sediment, and replacing worn headgates fall into this category. It is true that some such measures are likely to save water, but if they are measures that any well-run district should take anyway, they should not be credited as a step towards permanent beneficial reduction.

Absence of time schedules

The failure to provide time schedules is probably related to the failure to commit to serious goals. It appears that the many districts, taking their cue from the Bureau's guidelines and producing a list of measures in lieu of goals, simply developed a wish list of good ideas that might be implemented someday if finances permit. Of course a time schedule is not to be expected in such cases.

Conjunctive planning of surface and groundwater ignored

Proposals for district-level conservation tend to emphasize canal-lining, leak detection, and other physical means of reducing conveyance losses of surface water. These have an understandable appeal as visible, fundable activities, but if most of this water is being recovered later by groundwater pumping, the net saving on a district-wide basis may be small. This is all the more true where districts are promoting groundwater recharge, in which case canal leakage may be part of a district's water management plan.

Failure to take conservation seriously

It is clear that the Bureau has not been very demanding in getting contracting districts to write conservation plans. The Bureau took an unnecessarily long time to promulgate the regulations, and then interpreted the law to allow districts to go on doing what they were already doing. It set a deadline for compliance five years after passage of the law, and then proved willing to extend it by two more years in order to give districts extra time.³⁴

The go-it-alone attitude of the Bureau reflects another gap in its water conservation program. With the drought in the West now in its fifth year, one would have expected a crash effort to develop and implement strong cooperative conservation activities with other agencies. Instead, the Bureau has discussed the problem with other federal and non-federal entities, but not involved even one of them as explicitly required by section 210(c).

The reasons for the Bureau's reluctance to enforce the law are no great mystery. Some Bureau employees have expressed sympathy for districts because the "use it or lose it" tradition of the West really gives districts little incentive to practice conservation.³⁵ What's more, most state water rights are premised upon the grantee making "beneficial use" of water, leaving some districts reluctant to own up to any significant wastage in their operation. And employees of the Bureau have for 85 years advanced their careers by providing more water to districts, not by getting them to make do with less.

In sum, the occupational subculture of irrigation management does not encourage rigorous enforcement of any measure that, like the conservation plan requirement, tends to put the Bureau and the districts into an adversarial relationship. It should not be surprising that districts tend to drag their feet on water conservation and get away with it. This

³⁴ Although the Bureau's deadline for receipt of plans was July 1, 1987, the Upper Colorado Region sought and got permission from the Bureau to accept preliminary statements (so-called "stage one plans") on that date and extend the deadline for fully developed plans to July 1, 1989.

³⁵ It is interesting to note in this regard that a Bureau study on water conservation made these observations as far back as 1978: "Two of the major factors which inhibit implementation of water conservation measures are: (1) the probable reluctance by water users within the irrigation services area to relinquish any rights of water, and (2) the lack of procedures whereby beneficiaries outside the irrigation service area share in the reimbursable costs of the conservation measures." *Report on the Conservation Alternatives Study*, Bureau of Reclamation, September 1978.

does not excuse non-enforcement of the law, but it is something that must be taken into account in fashioning new remedies.

VI. NWF RECOMMENDATIONS

Water conservation practices are now gaining acceptance and achieving results for urban water systems from Boston to San Diego. The Bureau of Reclamation will have to play catch-up ball to get abreast of state, local, and private sector initiatives in this field, and lead its largely agricultural constituency to share in the benefits of efficiency improvements.

Conservation is not castor oil, but if federal water managers feel that it is, then their irrigation customers are not likely to feel much different.

We recommend a complementary set of carrots and sticks that will hasten the application and effectiveness of water conservation measures. Efficient use of water is required to halt the spiraling decline of fish and wildlife populations, maintain agricultural capacity, and sustain urban economies.

1. The Commissioner of Reclamation should rewrite and strengthen the requirements for water conservation by the Bureau's customers, pursuant to section 210 of the Reclamation Reform Act. Using existing authority to the fullest extent, the Bureau's water conservation program should include:

- The prompt implementation by all districts of widely recognized management practices for conserving water, including metering of all users, billing based upon metered use, and the elimination of promotional water rate structures and contracting practices;
- The establishment by all districts of a continuous program for making cost-effective investments in water conservation, based upon new plans to be submitted within 30 months;
- The identification of a quantitative goal and realistic timetable for water saving improvements by each district. Conservation measures yielding 10% savings in average water use should be achieved within 10 years, unless a customer can show that such savings cannot be achieved in a cost-effective way;
- Expanded technical assistance to districts for the identification, evaluation, and implementation of water saving measures, and encouragement to districts to collaborate on conservation programs;

- Application of water conservation requirements to the several categories of water users currently excused from compliance by the Bureau, including Small Reclamation Project loan recipients and irrigation districts served by reservoirs constructed by the Corps of Engineers; and
- Meaningful sanctions for non-compliance, including penalties in dollars or water or both.

II. The Bureau of Reclamation should actively promote markets for water that enable irrigators to profit from conservation. There is no better incentive than profit. As the major operator of water storage and conveyance facilities in the West, the Bureau has the ability to promote and facilitate water markets and other innovative proposals that allow irrigators to profit from conservation.


The Bureau's 1988 policy statement on water marketing said the agency would not stand in the way of beneficial transfers of Reclamation water. The Bureau must go further. Without the Bureau's active cooperation and participation, the potential benefits of transfers and markets can not be fully realized. The Bureau should encourage states and private brokers to engage in water transfers and develop innovative quasi-markets that benefit both buyers and sellers. Selling, renting, optioning, or leasing their allocations of Reclamation water would allow water users to capture the wealth implicit in their historical allotments, while letting conserved water be used by others. The Bureau should make its storage and conveyance facilities available for transfers of both Bureau and non-Bureau water. Congress should determine what share, if any, of new conservation profits should be recaptured for project repayment or other public purposes.

III. The Bureau of Reclamation should modify its pricing policies, and Congress should revise laws that underprice water and undercut conservation incentives. Underpriced federal water impedes voluntary and regulatory efforts to conserve water. The large subsidies in the price of Reclamation water and electric power used for pumping water are responsible for most of the misallocation of water to marginal uses.

Within the context of existing laws, the Bureau should rewrite the RRA regulations to recover capital costs as well as operations and maintenance costs on amended and renewed water service contracts, and ensure that "full cost" is charged for water delivered to acreage in excess of 960 acres. The Bureau has interpreted federal laws and regulations to minimize and stretch out repayment requirements for the costs of the projects so that irrigation water prices can be kept low. For example, not one dollar of the

one billion dollars of capital costs assigned to irrigation for the Central Valley Project in California has been repaid--more than 40 years after water deliveries began. The Bureau must strengthen the 1988 CVP Irrigation Pricing Policy formulated in response to an Inspector-General's audit. The policy does little to raise prices and lower demand.

IV. The Bureau's water conservation programs should be integrated with federal, state, and local efforts to enhance and restore fish and wildlife habitat. Wetland and riverine habitats require more water to sustain fish and wildlife populations.

In conjunction with federal, state, and local agencies, the Bureau and irrigation districts should identify beneficial uses for conserved water that include instream flows and habitat restoration. A substantial percentage of any water conserved or proposed for transfer should be dedicated to fulfilling the United States obligations and objectives under the North American Waterfowl Management Plan, the Endangered Species Act, and similar federal environmental commitments. 

V. The Bureau should identify reclamation-served lands with acute drainage problems and establish innovative water conservation programs to mitigate those problems. Water conservation minimizes the leaching of naturally occurring toxins, reduces the volume of polluted drainage water, and lowers high water table that can result in salinization.

The Bureau should require that water conservation plans submitted by districts in regions with acute drainage problems include plans to reduce drainage through increased irrigation efficiencies. These plans should emphasize input-conserving technologies, cultural practices, and crop substitution proposals that reduce irrigation water application. Lands with the highest concentration of potentially dangerous minerals or chemicals should be taken out of production, and water used to irrigate those lands should be redirected toward fish and wildlife needs.

TABLE I COMPLIANCE WITH RRA

CONTRACTING AGENCY	date of plan	pages	quantified goals?	specific measures?	timetable?	budget?
City of Lindsay	Mar-86	21	no	yes	no	no
Carpinteria County W. D.	Mar-87	17	no	yes	yes	yes
Centinella W. D.	May-87	11	no	yes	no	no
Clear Creek Community Services Dt.	Nov-85	7	no	yes	yes	no
El Dorado I.D.	Dec-85	34	yes	yes	yes	yes
Exeter I.D.	Jun-86	8	no	yes	no	no
Fresno I.D.	Jul-86	10	no	yes	yes	no
Glenn-Colusa I.D.	Oct-86	14	yes	yes	yes	no
Truckee-Carson I.D.	n.g.	6	no	yes	no	no
Westlands W. D.	Jun-86	21	yes	yes	yes	yes
Solano I.D.	Jun-85	8	yes	yes	yes	yes
Maine Prairie W. D.	Jun-86	3	no	no	no	no
Orchard Mesa I.D.	Apr-87	4	no	yes	no	no
Grand Valley Water Users' Assn	May-87	20	no	yes	yes	no
Ogden River Water Users' Assn	Apr-87	18	no	yes	no	no
Ephraim Irrigation Co.	Jul-87	3	no	yes	no	no
Horseshoe Irrigation Co.	Jul-87	4	no	no	no	yes
Weber Basin Water Conservancy Dt.	Dec-86	5	no	no	no	no
Uintah Water Conservancy Dt.	Jul-87	3	no	no	no	no
Pine River I.D.	Jun-87	3	no	no	no	no
Uncompahgre Water Users' Assn	Apr-87	3	no	yes	no	yes
Strawberry Water Users' Assn	May-87	70	in prep	yes	yes	yes
Shoshone/Heart Mtn I.D.s	Aug-86	10	no	yes	no	no
N. Colorado Conservancy D.	Jun-86	14	no	yes	yes	yes
Pathfinder I.D.	Apr-87	3	yes	yes	yes	no
Midvale I.D.	May-86	10	no	yes	no	no
Lower Yellowstone I.D.'s 1 & 2	Jun-86	3	no	yes	no	no
Belle Fourche I.D.	Sep-86	9	no	yes	yes	no
Imperial I.D.	Aug-85	200	yes	yes	yes	yes
Coachella Valley W. D.	Apr-87	6	yes	yes	yes	no

TABLE I COMPLIANCE WITH RRA

CONTRACTING AGENCY	date of plan	pages	quantified goals?	specific measures?	timetable?	budget?
Salt River Valley Water Users' Assn	Dec-85	42	no	yes	no	no
Welton-Mohawk I. & D. Dt.	Oct-86	12	yes	yes	no	no
Yuma County W. U. A.	Oct-86	18	yes	yes	yes	no
Elephant Butte I. D.	Jun-87	17	yes	yes	yes	yes
Arch Hurley Conservancy Dt.	Oct-86	5	no	yes	no	no
Hidalgo & Cameron Co. I.D. #9	Aug-86	6	yes	yes	yes	yes
A & B I. D.	Nov-86	16	no	yes	no	no
American Falls Reservoir Dt. #2	Nov-86	6	no	yes	yes	yes
Black Canyon I. D.	Jun-86	6	no	yes	yes	yes
East Columbia I.D.	Mar-87	15	yes	yes	yes	yes
Minidoka I.D.	Oct-86	2	no	yes	yes	no
Quincy-Columbia I.D.	Sep-86	3	yes	yes	yes	yes
Roza I. D.	Jul-87	90	yes	yes	yes	yes