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Report to the Chairman, Subcommittee on Water and Power, Committee on Energy and Natural Resources, U.S. Senate

May 1994

WATER TRANSFERS

More Efficient Water Use Possible, If Problems Are Addressed

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GAO

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Resources, Community, and
Economic Development Division

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May 23, 1994

The Honorable Bill Bradley
Chairman, Subcommittee on Water and Power
Committee on Energy and Natural Resources
United States Senate

Dear Mr. Chairman:

This report responds to your request that we examine the usefulness and feasibility of allowing water provided from federal water projects to be resold on the market in the western United States. Our review addressed the beneficial and adverse impacts of water transfers; how water markets might be structured to address the impacts of transfers on third parties not involved in transfers; the legal, institutional, and other issues that need to be addressed in implementing a federal water market; and how transfers of water from federal projects could be coordinated with states' laws.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Secretary of the Interior; the Commissioner, Bureau of Reclamation; the Secretaries of Defense and the Army; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others on request.

This report was prepared under the direction of James Duffus III, Director, Natural Resources Management Issues, who can be reached at (202) 512-7756 if you or your staff have any questions. Major contributors to this report are listed in appendix V.

Sincerely yours,

Keith O. Fultz

Keith O. Fultz
Assistant Comptroller General

Executive Summary

Purpose

Debates over how water from western federal water projects should be used have become more heated in recent years. Agriculture uses over 80 percent of the western water withdrawn for use, but environmental problems, such as selenium contamination and salinity, have been associated with agricultural irrigation. Moreover, as urban populations, tourism, and environmental awareness continue to grow, the demand for water increases for cities, recreation, and fish and wildlife habitat. Constructing dams to meet new demand often is no longer feasible because of their adverse environmental impacts and high costs.

Water markets, in which rights to use water are bought and sold, are becoming an important factor in the debate. Advocated by resource economists and others, water markets would allocate water to its highest economic use by allowing those who place the highest economic value on it to buy it. The Chairman of the Subcommittee on Water and Power, Senate Committee on Energy and Natural Resources, asked GAO to examine (1) the beneficial and adverse impacts of water transfers; (2) how water markets might be structured to address the impacts on parties outside of transfers; (3) the legal, institutional, and other issues that need to be addressed to implement a federal water market; and (4) how transfers of water from federal projects could be coordinated with the states' laws.

Background

The 17 western states rely on the "prior appropriation" system of water rights for much or all of their surface water: Unless water is put to a state-defined beneficial use, those who hold water rights may forfeit their right to use the water. Each state defines beneficial use, which often includes agricultural, domestic, and industrial uses.

The federal government's role in western water is primarily through the water development projects constructed and operated by the Department of the Interior's Bureau of Reclamation and, to a lesser extent, by the Department of the Army's Corps of Engineers. By the late 1980s, the Bureau's projects supplied water to 26 percent of all irrigated farmland in the 17 western states and also provided water for municipal and industrial uses and other purposes. The Bureau provides the water through contracts with state-established water and irrigation districts.

The federal government has recognized the primacy of the states' water laws in water allocation. The U. S. Supreme Court has indicated that state laws govern the control, appropriation, use, and distribution of federal

reclamation project water, unless the application of the state laws would be inconsistent with an explicit congressional directive.

Under the 1992 Central Valley Project Improvement Act (title XXXIV, P.L. 102-575), water users in the Central Valley Project in California can now resell their federally supplied water to other users in the state. While some transfers of water from other federal projects have occurred under earlier reclamation law, this is the first federal legislation, outside of legislation to alleviate drought conditions, to generally allow federal water users to resell their contracted water outside of a project's boundaries for any state-defined beneficial use.

Results in Brief

Water markets can be an effective tool for using water more efficiently and improving environmental quality by giving users economic incentives to conserve water and sell it to those who place a higher economic value on it. But water transfers can cause a variety of adverse economic, social, and environmental impacts on third parties, and existing laws and procedures may not fully protect the third parties from these impacts. Concerns about such impacts may result in considerable opposition to transfers.

GAO's analysis of strategies for addressing the adverse impacts on third parties showed that the strategies' effectiveness varies and that no one strategy is best. Moreover, each transfer situation is unique, and strategies may effectively address certain impacts in some circumstances but not in others. Choosing appropriate strategies requires the consideration of local conditions and of existing laws and procedures. A combination of strategies is likely to be needed.

Many issues must be addressed in implementing federal water markets. In some states, holders of water rights risk losing them if they propose transfers because conservation and transfer may be seen as evidence that they did not beneficially use all of their water. Some states' laws limit purchases of water for instream purposes, such as providing for fish and wildlife habitat and recreation. In addition, control over the rights to Bureau-provided water and over Indian water rights is unclear. Federal reclamation and other laws can limit transfers to certain uses and project areas, and the Bureau and the Corps have not adequately specified their requirements for approving transfers of water rights.

Whether markets should be encouraged beyond the Central Valley Project is a policy matter for the Congress. A fundamental issue in developing a

federal transfer policy is the appropriate role of the federal and state governments in removing the impediments to transfers at the state level and in addressing the impacts on third parties. The Congress could continue to rely heavily on the states' laws and procedures, it could develop its own approval requirements and beneficial-use laws, or it could encourage further changes in the states' laws.

Principal Findings

Water Markets Promote Efficient Water Use

Economic theory indicates that water markets—that is, voluntary transfers of water—provide users with financial incentives for reallocating water to its highest economic use. Buyers will only enter into transactions that provide a less expensive water supply than other sources, and sellers will only enter into transactions that provide more financial benefit than the current water use. As water becomes more valuable and prices rise, markets provide users with incentives to conserve, which can reduce environmental degradation and free up water to be sold for other uses. Environmental values can be enhanced further if government agencies and private conservation groups can purchase water rights for environmental protection.

Increasing the rates paid by users of federal water is another method of improving efficiency, although not necessarily to the same extent as markets. This approach would have a different effect on water users because higher rates impose a financial burden on water users, while voluntary market transactions provide financial benefits. Yet raising rates can enhance federal revenues more significantly than can transferring water because all of the revenues from higher rates are returned to the government; in a market, the seller retains a portion of the water's sale price for profit.

Water Transfers Can Have Impacts on Third Parties

The parties outside of a transaction may be worse off or better off than before a transfer. For example, changes in water use can affect the individual holders of water rights if their rights depend on the existing patterns of water use. If agricultural land is taken out of production to transfer water to urban areas, economic impacts can occur, such as reductions in farm income, decreases in property tax revenues, and the dislocation of farmworkers. The local tax base may shrink, local services

may decline, and the remaining farms may not be able to support local businesses. Communities can also experience impacts on their way of life and on local traditions. But parties outside of the transaction may also be better off. For example, more jobs may be created in areas that purchase water.

While water transfers can improve environmental quality, they can also adversely affect the environment. Impacts on surface water conditions occur from reductions in instream flow levels, decreases in the return flows used by wildlife, and changes in reservoir operations. Groundwater overdraft can occur when transferred surface water is replaced through increased groundwater pumping, or the water previously used to replenish the groundwater is transferred elsewhere. Soil problems can occur if farmland is retired when water is sold.

Many other market transactions affect third parties in some way, but many involved in water markets believe that water transfers differ from most economic transactions because of the nature of the impacts. In addition, concern about the adverse impacts can create opposition to transfers.

Strategies May Be Needed to Address Adverse Impacts on Third Parties

While many of the requirements that must be satisfied before federally supplied water can be transferred address the potential impacts on third parties, the current laws and procedures may be inadequate. Federal environmental laws can protect against some adverse environmental impacts, but these laws were not specifically designed or coordinated to address the range of impacts associated with transfers. Federal review of transfers under the National Environmental Policy Act, which considers the potential environmental impacts of federal actions, varies: Some transfers can be categorically excluded from any environmental review, while others might require environmental impact statements.

The Bureau of Reclamation relies on the states to address many of the impacts on third parties. But the states vary in the extent to which they review proposed transfers for impacts on local communities and the environment. Some impacts, such as those on local economies, are not addressed under some states' transfer procedures.

Many strategies for mitigating the adverse impacts of water transfers have been proposed or implemented. GAO analyzed 14 of these strategies to determine their effectiveness in addressing the impacts on third parties and the impediments they add to transfers. These strategies included such

options as establishing minimum streamflow standards, compensating those communities that lose water, and taxing transfers. GAO's analysis showed that the strategies vary in their effectiveness and in the impediments they create and that no one strategy is best in all situations. Choosing appropriate strategies requires the consideration of local economic, social, and environmental conditions and the recognition of existing laws and procedures for transfer approval. A combination of strategies is likely to be needed to address the wide range of impacts on third paries.

Decisionmakers also must determine which impacts should be addressed—many market transactions, not just water transfers, have economic impacts, and some parties lose while others win. Yet governments do not mitigate the adverse impacts of most transactions in the overall economy.

State and Federal Water Laws Can Affect Implementation

Effective markets require a clear, secure definition of property rights to allow the holders of water rights to form expectations about the benefits of the rights. At the state level, the prior appropriation doctrine of water rights can discourage water conservation and transfer because successful conservation and transfer may be seen as evidence that the user did not need all of the water and therefore did not beneficially use it. In addition, some states do not recognize some instream uses providing for fish and wildlife habitat, the environment, and recreation as beneficial and limit the purchase of water rights for such uses.

State-established water and irrigation districts usually contract with the Bureau of Reclamation for water delivery from the Bureau's projects. If the contracts are amended and the delivery schedules are changed to allow transfers, the districts must agree to the changes. However, the individual water users within the districts make decisions about water use and conservation. Some economists believe that individuals have greater incentive to conserve if they can sell water directly for profit, without going through the district.

Many Indian tribes hold rights for water that predate many of the water rights held by non-Indians under the states' appropriation laws. The selling or leasing of tribal water rights may be a means of improving the tribes' economic conditions. However, neither Indians nor non-Indians know with certainty the nature of these rights because many Indian rights have

not been quantified. It is also unclear to what extent federal or state laws control the transfer of these rights.

Federal reclamation law generally provides little guidance on water transfers, but it can limit the areas and uses of Bureau-provided water. Interior's and the Bureau's policies and guidance have not clearly interpreted how reclamation law affects water transfers and have not clarified other requirements for approving transfers, such as the rates to be charged for the transferred water and for environmental requirements. Similarly, both the legislation authorizing the Corps' projects and other laws limit the uses of Corps-provided water and may prevent transfers to some uses. In addition, the Corps has not developed policies and guidance to govern transfer approval. When approval requirements are unclear, buyers and sellers are uncertain about what requirements must be met and whether their transfers will be approved or will be profitable.

The Congress Has Three Options for Federal Involvement

The major issue facing the Congress in water markets is the extent of the federal government's involvement. While many obstacles in federal law and policy to transfers of federally provided water can be removed without affecting the states' water laws, changes to some state laws could encourage more transfers and improve efficiency by recognizing transfers and instream uses as beneficial. In addition, changes to some states' approval processes could improve the consideration of the impacts on third parties. The states' laws have been changing, but the changes have been uneven.

In general, the western states assert primacy over water allocation and wish to minimize the federal role. The federal government has three options in connection with its role: It can continue to rely heavily on the states' laws and procedures, it can develop its own requirements for approving transfers and its own beneficial-use laws, or it can encourage the states to make changes in their laws. To encourage further changes, the federal government could provide the states with incentives. The states that demonstrate consideration of the entire range of water values and interests associated with water provided from federal facilities would be allowed to improve water use efficiency through transfers, without federal mandates beyond current requirements. This policy would allow the states to control their water in ways that satisfy their needs without federal involvement, yet improve current levels of efficiency and the consideration of third parties.

Matters for Congressional Consideration

Ultimately, whether to encourage more widespread voluntary market transfers of federally provided water as a way to address water supply and environmental problems and to promote economically efficient water use is a policy decision for the Congress. Another option for improving efficiency and encouraging conservation is increasing the water rates paid by federal water users.

If the Congress decides to further encourage water transfers, it should remove the legal impediments to transfers in reclamation law and other water laws. In coordinating federal policy with the existing state laws governing water use, the Congress should consider whether to (1) continue to rely on the states' procedures governing the impacts on third parties and beneficial use, (2) make consideration of the impacts of transfers part of the federal review process and indicate that conservation, transfer, and instream uses are beneficial uses of water provided from federal facilities, or (3) encourage the states to make further changes in their laws to meet desired goals. Each of these approaches has advantages and disadvantages.

Recommendations

While each water transfer is unique and the actual requirements for approving transfers may vary case by case, GAO believes that the current approval requirements can be clarified further. GAO is providing recommendations to the Secretaries of the Army and the Interior to clarify guidance on approving transfers to more clearly outline the requirements that must be met, including how the federal laws and environmental requirements must be satisfied, how the rates for transferred water will be determined, and whether contracts must be amended.

Agency Comments

GAO requested and received comments on a draft of this report from the Departments of the Interior and Defense. They generally concurred with the findings and the recommendations. However, GAO is concerned that the Departments did not indicate that they would take action in the near future to clarify the current requirements for approving transfers. Interior stated that the Bureau of Reclamation is developing and intends to propose legislation to address federal impediments to the water transfer process. In addition, Interior stated that efforts currently are under way to specify requirements for water transfers in the Central Valley Project and the Lower Colorado River Basin. The Department of Defense indicated that because the Bureau is the predominant agency with jurisdiction over the sale of federally provided irrigation water in the West, the Army would

take action after Interior develops water transfer policies. GAO believes that more immediate action is needed and that requirements need to clarified for all projects.

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Abbreviations

ACIR	Advisory Commission on Intergovernmental Relations
CVP	Central Valley Project
DOD	Department of Defense
M&I	municipal and industrial
NEPA	National Environmental Policy Act

Introduction

The federal government plays a role in western water use in large part through water development projects constructed by the Department of the Interior's Bureau of Reclamation and, to a lesser extent, by the Department of the Army's Corps of Engineers. State laws govern most decisions on water allocation and use in the western United States, including water provided from federal facilities, unless the state law conflicts with a clear congressional directive. Western states want to retain this primacy over water use.

Federal Water Projects and Western Water Law

The Bureau of Reclamation plans, constructs, and operates water resource projects to provide water for various purposes in the 17 western states.[1] The Reclamation Act of 1902 provided for the construction of irrigation works in the western states, to be repaid by irrigators, but included no requirement for the irrigators to pay interest. The service areas and authorized purposes for the Bureau's projects are generally indicated in the authorizing legislation for each project. Generic laws also affect the project's purposes and operations.

Most federally supplied irrigation water is marketed by the Bureau. By the late 1980s, the Bureau's projects supplied water to an estimated 26 percent of all the irrigated farmland in the 17 western states; they also provided water for municipal and industrial (M&I) and other purposes. The Bureau sells most of its irrigation water to state-established water and irrigation districts that obtain the water under contracts and distribute it to farmers. Through service or repayment charges, the Bureau, over time, recoups a portion of the federal government's investment in providing the water.

The Corps of Engineers constructs dams and operates reservoirs throughout the United States under specific authorizing legislation for each project and generic legislation applicable to all of the Corps' reservoirs. Many of the Corps' dams were constructed for flood control purposes, and some provide storage space for M&I water, irrigation water, and hydroelectric power, among other purposes. The Corps enters into contracts with water rights holders to store water in the Corps' facilities. In general, the Bureau administers contracts for irrigation water delivered from the Corps' projects in the western United States, while the Corps administers contracts for M&I water from its projects.

[1]The 17 western states include Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

While federal legislation provides some control over the use of the water provided from federal projects, rights to use water generally are governed by state laws. All western states rely on the "prior appropriation" doctrine to define water rights for some or all of their surface water. The prior appropriation system works on a "use-it-or-lose-it" philosophy: Unless water is put to beneficial use, water rights holders abandon or forfeit their right to use the water. State laws define beneficial use, which usually includes agricultural, domestic, and industrial uses, among others, and sometimes requires that water be diverted from the stream to be considered beneficially used. Those parties wishing to appropriate water for a beneficial purpose must do so in accordance with the states' requirements. This prior appropriation doctrine also is based on the premise of "first in time, first in right," whereby parties who obtained water rights first generally have seniority for the use of water over those who obtained rights later. Therefore, in times of shortage, the holders of senior water rights get water first, and the holders of junior rights may get a reduced supply or none at all.

The federal government has recognized the primacy of the states' water laws in water allocation under the Desert Land Act of 1877, as amended (43 U.S.C. 321); section 8 of the Reclamation Act of 1902, as amended (43 U.S.C. 372, 383); and the Clean Water Act of 1977, as amended (33 U.S.C. 1251 (g)). The Supreme Court has held that under section 8 of the Reclamation Act, the states' laws govern the control, appropriation, use, and distribution of federal reclamation project water, unless the application of state law would be inconsistent with an explicit congressional directive.[2] For example, the water rights associated with a federal project generally depend upon the laws of the state in which the project is located. As a result, water provided from the Bureau's projects usually is appropriated by the Bureau or by irrigators under state laws and must be applied to beneficial use as defined by the states. In contrast, the Corps does not appropriate any water rights; it simply provides storage space in reservoirs for others who hold recognized water rights.

The western states want to assert their primacy over water allocation with minimal involvement by the federal government. The Western Governors'

[2]California v. United States, 438 U.S. 645 (1978).

Association[3] and the Western States Water Council[4] stress a limited federal role in western water management. They maintain that the federal government has the responsibility to address overarching national concerns and interests and should continue to provide research on and financial support for national goals and to operate federal projects and systems. They stress that the states have the primary role in water resources management but note that the states need to affirm their responsibility for addressing the entire range of public values in water use. They recognize a federal role in helping the states move in this direction, such as in delegating authority to state programs while the federal government retains oversight responsibility to determine whether the states have satisfied federal public interest obligations.

Objectives, Scope, and Methodology

The Chairman of the Subcommittee on Water and Power, Senate Committee on Energy and Natural Resources, asked us to examine, from a public policy perspective, the usefulness and feasibility of allowing the water provided from federal projects to be resold on the market to address water use problems in the western United States. Specifically, we agreed to address (1) the beneficial and adverse impacts of water transfers; (2) how water markets might be structured to address the impacts of water transfers on third parties outside of transactions; (3) the legal, institutional, and other issues that need to be addressed to implement a federal water market, and (4) how transfers of water from federal projects could be coordinated with the states' laws. We were also asked to address how federal revenues can be increased by water transfers and will report these findings in a separate report.

To determine how water markets might help resolve current water management problems, as well as cause adverse impacts, we reviewed the economic, legal, environmental, and public policy literature on water markets and discussed these issues with lawyers, economists, and other water professionals who have written about and worked with water markets. We also reviewed the states' transfer procedures as summarized

[3]The Western Governors' Association is an independent, nonpartisan organization of western states, one Pacific Commonwealth, and two territories. Its members include most of the states with Bureau of Reclamation water projects. Its purpose is to strengthen the policy-making and management capacity of the member states and their role in the federal system. The association serves the interests of the governors across a range of concerns, including energy, agriculture, water, natural resources, international trade, fiscal policy, economic development, and related issues.

[4]The Western States Water Council consists of governors of 17 western states and their appointees. Its members include most of the states with Bureau of Reclamation water projects. It has endeavored to develop a regional consensus on West-wide water policy and planning initiatives, to protect western states' water interests, and to coordinate and facilitate efforts to improve western water planning and management.

in the literature, major federal environmental laws, the Bureau's and the Corps' environmental review procedures, and federal transfer policies and guidance to determine whether federal or state laws and procedures address the problems associated with water markets. We did not independently verify the current status of all state laws. We recognize that the states' laws have been changing.

To examine how water markets might be structured to address the third-party impacts of water transfers, we reviewed literature and discussed with lawyers, economists, and other water professionals the variety of policy options put forward as solutions. We summarized 14 strategies discussed and analyzed them to determine which were likely to address various third-party impacts and what impediments to transfers they caused. Our analysis and conclusions were reviewed by lawyers, economists, state water officials, and other professionals involved in water market issues at universities, state agencies, and other organizations to provide a variety of perspectives. We received responses from approximately two-thirds of those who received our analysis. These reviewers are listed in appendix II.

To determine the legal, institutional, and other issues to be addressed in implementing a federal water market, we reviewed federal reclamation law, other water development laws, the Department of the Interior's water transfer principles, the Bureau of Reclamation's criteria and guidance, and policies governing water use and reallocation from the Corps of Engineers' projects. We met with Interior and Bureau officials from Washington, D.C., and the Bureau's Mid-Pacific Regional Office and contacted officials from the Bureau's Upper Colorado, Lower Colorado, Pacific Northwest, and Great Plains Regional Offices about regional transfer policies. We met with Corps officials in Washington, D.C., and the Sacramento District Office to discuss policies at both headquarters and in a sample district. We discussed policies with the Seattle, Walla Walla, and Portland District Offices, which have been involved in water reallocation efforts. We also reviewed the states' water laws and commentaries on the laws and discussed impediments at the state and federal level with lawyers, economists, and other water professionals who have written about and been involved with water market issues.

To address coordination of federal project water markets with the states' laws, we reviewed state laws, federal laws, and court cases on federal recognition of state primacy and reviewed the literature on state laws governing water transfers. We also reviewed reports on water

management and water markets written by the Western Governors' Association and the Western States Water Council. We discussed the federal role in water transfers with a representative of the Western Governors' Association. We also reviewed the U.S. Advisory Commission on Intergovernmental Relations' report addressing the federal role in water management.

Our work was conducted between January 1992 and February 1994 in accordance with generally accepted government auditing standards. We obtained comments on a draft of this report from the Departments of Interior and Defense. Agency comments and our responses are presented fully in appendixes III and IV.

The Beneficial and Adverse Impacts of Water Transfers

While most of the water in the western states is used for agriculture, the demand for urban, recreational, and fish and wildlife uses is increasing. Environmental problems have been associated with irrigation throughout the West. Many believe that the use of water markets—the voluntary buying and selling of rights to use water—is an efficient way to (1) reallocate water to those who place the highest economic value on it and to (2) improve environmental quality. However, transferring water from one location or use to another can adversely affect those not involved in the transfer and alter the environment.

Environmental and Water Use Problems Exist in the West

Over 90 years ago, the Congress, seeking to reclaim arid western lands and promote the agricultural development and settlement of the West, began enacting various reclamation laws to provide for the construction of irrigation projects. While agricultural irrigation has contributed to making the United States a world leader in agricultural production, it has had environmental costs and now limits the amount of water available for other uses.

In August 1991, we reported that environmental and water use problems are associated with irrigation practices carried out with subsidized[1] Bureau of Reclamation water in the Central Valley Project (CVP) of California.[2] Irrigation practices have contributed to selenium[3] poisoning and increasing salinity in the CVP's San Joaquin Valley. With most CVP water dedicated to irrigation through water service contracts, the water supply has been inadequate for wildlife habitat and unavailable for growing urban populations. Furthermore, some farmers use CVP water to produce crops that are also eligible for subsidies under the U.S. Department of Agriculture's commodity programs.

The Central Valley Project Improvement Act, passed in October 1992 (Title XXXIV of P.L. 102-575), addresses the problems in the CVP by allocating water to fish and wildlife; requiring environmental impact studies before long-term contracts are renewed; creating a fish and wildlife restoration fund, funded in part from increased irrigation rates; and allowing farmers

[1]Federal irrigation rates are considered to be subsidized because they do not include interest on the federal government's costs incurred in constructing the irrigation component of the project's facilities.

[2]Reclamation Law: Changes Needed Before Water Service Contracts Are Renewed (GAO/RCED-91-175, Aug. 22, 1991).

[3]Selenium, a trace element that occurs naturally in soil, has been associated with abnormalities in waterfowl, such as deformities and mortality in embryos, as well as weight loss and death in adult birds.

to sell water to others for any beneficial use, such as municipal use or fish and wildlife.

Similar environmental and water use problems exist elsewhere in the West. Over 80 percent of the water withdrawn for use in the West currently is used for agriculture. Yet increased salinity is a by-product of agricultural irrigation. All water carries dissolved salts, and as irrigation water evaporates, the salts are left behind. Salt damage from salinity includes reductions in productivity and restrictions on crops that can be grown. An estimated 25 to 30 percent of the irrigated lands in the United States suffer from yield reductions because of salinity. Severe salinity problems in the Colorado River Basin have resulted in losses estimated to exceed $100 million annually in recent years. In addition, the Department of the Interior has surveyed wildlife areas that receive irrigation drainage water and has identified sites in Utah, Wyoming, Nevada, and Colorado that may have reached unacceptable levels of contamination by selenium and other toxic substances.

In addition, urban growth in the West is increasing the demand for M&I water use. Recreation and tourism continue to grow in economic importance in the West, and demand is growing for these instream uses as well as for environmental protection. While new demand traditionally has been met by building more dams and reservoirs, this alternative often is no longer feasible. Water projects often are considered too environmentally damaging, the best reservoir sites have already been developed, and remaining sites would be very costly to develop. As a result, increased efficiency and reallocation of existing resources may be necessary to meet the future demand.

Because so much water currently is used for irrigation, while other needs are undersupplied, some believe that water should be reallocated from agricultural to urban, environmental, or recreational purposes. Urban areas are often willing to pay much more for water than irrigators and require only a small fraction of the water necessary for irrigated agriculture. Many resource economists believe that water markets can reallocate water in an economically efficient manner among irrigation, M&I, environmental, and recreational purposes by letting voluntary transfers determine the highest economic use of water.

For example, the Central Valley Project Improvement Act allows individuals and water and irrigation districts within the CVP to sell water to other water users in California. Transfers are allowed to assist California

urban areas, agricultural users, and others in meeting their future water needs. The act is the first federal legislation, outside of legislation to alleviate drought conditions, to generally allow water provided from federal projects to be resold to any other users in the state.

Water Markets Promote Economically Efficient Water Use and Improve Environmental Quality

Many economists, environmentalists, and others believe that allowing water to be traded in the market results in the voluntary reallocation of water to the economically highest-valued uses and allows for more efficient use of the existing water supplies. Water markets allow water rights or the use of water to be transferred. Transfers can involve changes in the nature of water use, point of diversion from a water body, place of use, or period of use. Transfers can be permanent, such as through the sale of a water right in perpetuity, or they can be temporary, such as through leases to allow the use of water for a certain period of time, while the original holders retain the water rights. Water transfers have occurred in western states, and some transfers have involved water provided from federal facilities. We did not independently evaluate the impacts of these transfers, but we have based our discussion on other reviews of the potential or actual impacts of transfers.

Water Markets Increase Economic Efficiency

Current federal water practices generally allocate water to certain users and uses through contracts that lock water supplies into existing uses for long periods of time, often at low rates. In contrast, water markets provide more flexibility by allowing those who place a higher economic value on the water to purchase it at its market price. Economic theory indicates that markets generally generate economically efficient outcomes because they facilitate voluntary trading among users. Water markets provide the users with the financial incentives for reallocating water—the buyers will enter into transactions only if these transactions provide a less expensive supply than other sources, and the sellers will enter into transactions only if the transactions provide more financial gain than the current water use. The buyers and sellers are both better off because of the transactions. In this way, voluntary trading automatically sorts out competing uses and delivers water to those who put the highest economic value on it. For example, in a particular location, water may be worth $30 per acre-foot when used to produce a given crop, while a manufacturing company is willing to pay $200 per acre-foot to develop new water supplies for its growing operations. In a water market, the company could purchase the water from the irrigator for $150 per acre-foot, saving itself $50 per

acre-foot and allowing the irrigator to realize a considerable profit. Water may also be transferred among agricultural users.

Many economists maintain that water markets can enhance the efficiency of water use. As water becomes more valuable and prices rise, markets send signals to water users to conserve water. Users who can reduce their consumption do so and sell the conserved water to those who want more. Once water users face the true value of water—the price others would be willing to pay for it—they have the financial incentives to balance their use against the potential gains from transfers.

For example, current federal water rates reflect the capital repayment costs set by the federal government, which are often subsidized but do not necessarily reflect the value of the water to others. Low federal prices for water provide farmers with little incentive to invest in more efficient irrigation practices or technologies or change their cropping patterns. Efficient irrigation methods, such as using drip and sprinkler application systems, leveling fields to reduce runoff, and lining irrigation canals, are expensive to install. But markets can encourage farmers to conserve water and voluntarily sell their conserved water to urban areas or others willing to pay higher prices for the water. The farmer could use the price paid to finance conservation measures. Thus, the farmer could be made better off financially, while others could enjoy water at lower prices than they could through alternative sources.

Water Markets Can Provide Environmental Benefits

Some economists and environmentalists maintain that conservation ensuing from water markets can bring about environmental benefits. When farmers apply less irrigation water, agricultural drainage and runoff decrease. In addition, purchasing agricultural water is often less expensive than developing alternative sources of water, such as by building dams. Reallocating the existing supplies to those willing to pay would reduce the need to construct expensive and potentially environmentally damaging new dams.

Water currently dedicated to irrigation could be sold to maintain fish and wildlife habitat that has inadequate supplies. This would involve transferring the water from a diversionary use, in which it is taken out of the stream, to an instream use, in which it is kept in the stream. Environmentalists maintain that, through such purchases, instream values can be maintained and enhanced. Instream values include environmental values, such as water quality and fish and wildlife, as well as economic

values, such as recreation and tourism. The environmental values can be protected and enhanced by water markets if those with an interest in environmental enhancement, such as government agencies and private conservation groups, can purchase water rights for this purpose. For example, the Nature Conservancy, a private nonprofit organization established to protect unique natural areas, has purchased water rights to maintain fisheries and wetlands in Colorado, Arizona, and Nevada. Similarly, recent federal legislation authorizes the purchase of water rights to maintain wetlands and fisheries in Nevada's Lahontan Valley and Pyramid Lake.[4] The economic values of instream water can also be protected if those relying on instream uses for income or pleasure purchase water rights for these purposes. Instream purchases increase the economic efficiency of water markets by allowing those who value nonconsumptive uses of water to participate in markets.[5]

Such purchases can be a very effective way of protecting instream values. An alternative—appropriating new water rights from states for these purposes—can also protect instream values but provides less security in times of shortage because the new rights are junior to the older existing rights. Many water systems are heavily used, and the holders of senior rights with earlier appropriation dates receive higher priority than the holders of new instream rights. In times of shortage, the holders of junior instream water rights may receive a reduced supply or not get any water at all. Purchasing senior rights for instream uses, when allowed by state law, can help protect instream values by providing a more secure supply.

Transfers of Federally Supplied Water Will Increase Federal Revenues

Transfers of water provided from the Bureau of Reclamation's facilities can increase federal revenues, if the water is transferred from irrigation to M&I uses. As the water is transferred from irrigation to M&I uses, the Bureau charges the water users the higher M&I rate for the water, which includes interest on the construction costs owed the federal government, plus interest during construction. The irrigators do not pay interest on the construction costs associated with irrigation and are required to pay only those construction costs deemed within their ability to pay. When the costs are above the irrigators' ability to pay, they generally are paid by the power users at the end of the 40- to 50-year repayment period. We

[4]Section 206, 207 of P.L. 101-618, The Truckee-Carson-Pyramid Lake Water Rights Settlement Act.

[5]While market purchases for instream flows can help protect instream values, many economists indicate that the market alone is insufficient to protect these values fully. Instream flows have public-good characteristics that make it difficult to translate their values into dollars to bid for water rights in the market. These characteristics include difficulty in excluding those who do not pay for the resource from enjoying the benefits of the resource, resulting in "free riders" who can enjoy the resource but make no payments. Public agencies may also have to provide for these goods.

currently are analyzing how federal cost recovery and revenues can be increased from water transfers and will report these findings separately.

Other Options Exist for Increasing Efficiency

Increasing the water rates paid by federal water users is another method of improving efficiency and encouraging water conservation, although not necessarily to the same extent as markets. These approaches affect water users differently. Higher rates provide irrigators with the incentive to reduce water use through conservation but impose financial burdens on irrigators through higher water costs. As a result, higher rates are likely to be resisted by irrigators. We discussed the impacts on farmers' profits of raising irrigation rates in our 1994 report.[6] Conversely, markets allow irrigators to realize financial gain by reallocating water through voluntary transfers. Buyers and sellers will not participate in the transaction unless both will be made better off; therefore, no financial burden is placed on those who participate.

Federal revenues may be increased to a greater extent by higher rates than by market transfers, depending on how much the price of water is raised. This increase occurs because all of the revenues from higher rates are returned to the federal government, while in a market, the seller retains a portion of the water's sale price for profit.

Water Transfers Can Have Adverse Economic, Social, and Environmental Impacts

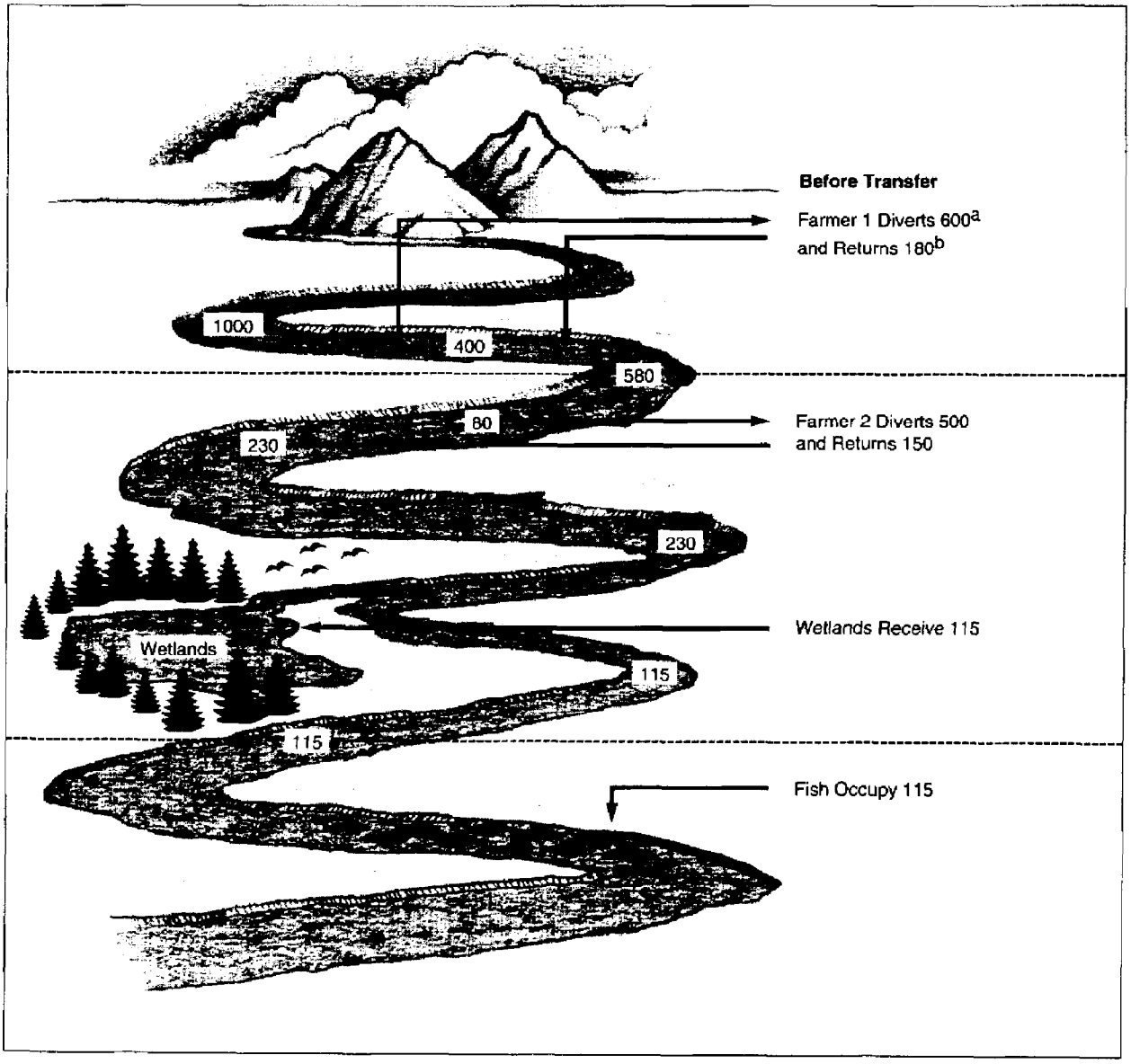
Economic theory indicates that voluntary market transfers ensure that the buyer or the seller—or both—are better off, and neither is worse off; otherwise, the transfer would not take place. However, the impacts on third parties outside of the transaction may make some better off and some worse off than they were before the transfer. While many market transactions affect third parties in some way, many economists and others involved in water markets believe that water differs from most commodities because of the nature of its impacts. These impacts affect individual holders of water rights, local communities, and the environment. In addition, unless significant adverse impacts are addressed, those concerned about third-party impacts may impede transfers through litigation or oppose water markets through political influence.

[6]Water Subsidies: Impact of Higher Irrigation Rates on Central Valley Project Farmers (GAO/RCED-94-8, Apr. 19, 1994).

Water Rights Can Be Diminished

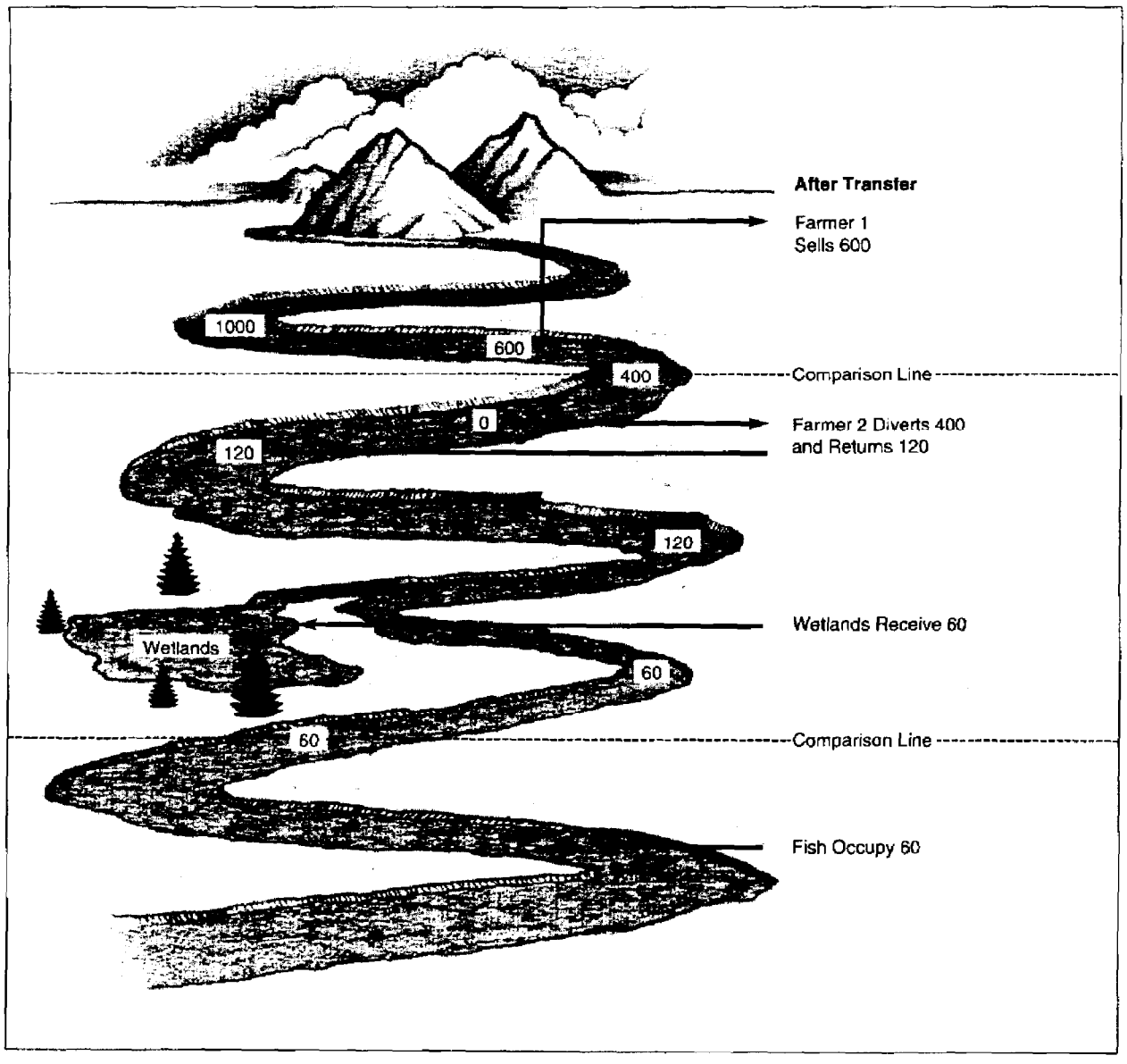
Because of the interdependence of water uses within water systems, the transfer of water may diminish the supply of another water rights holder. For example, the water diverted for use often is not entirely consumed—irrigation systems are not 100 percent efficient. Some of the diverted water may return to the stream for future use by others downstream; this water is referred to as "return flow." If an upstream irrigation right is transferred to a new place in another river basin, return flows are no longer available to others in the original basin. Similarly, if water is transferred from one location to an upstream use, the streamflow between the new location and the old location is decreased, because the water is diverted out of the stream sooner. Figure 2.1 illustrates how water previously used by the holders of water rights downstream can be removed or reduced if the upstream return flows are sold to others. In figure 2.1, less water is available for Farmer 2 after Farmer 1 transfers water upstream.

Figure 2.1: Impact of Transfer on Water Rights and Surface Water Conditions



[a]Amounts are in acre-feet. An acre-foot is the amount of water needed to cover 1 acre of land to a depth of 1 foot—or about 326,000 gallons.

[b]Returns assume a 70-percent irrigation efficiency



Although the states' laws and approval processes vary, all western states consider the possible impacts of proposed transfers on individual water

rights. Under state laws, transfers that injure another party's water rights generally are not allowed or are modified so that other rights are not diminished. One way this is accomplished is by allowing only the amount of water actually consumed to be transferred, not the entire amount diverted. Consequently, return flows relied upon by others are less likely to be diminished. The Bureau of Reclamation and the Corps of Engineers also review proposed transfers to ensure that the other users and purposes of a water project will not be harmed by transfers.

Water Transfers Can Affect Communities Economically and Socially

Concerns exist within agricultural communities that, because cities often are willing to pay more for water than irrigators are, they will buy agricultural water rights and put agricultural communities out of production. However, agriculture currently uses over 80 percent of the water used in the West, and cities do not require as much water as irrigated agriculture. Economists predict that most water will remain in agriculture. For example, some economists predict that if 10 percent of California's agricultural water were conserved, the state's growing demands could be met for decades without developing any new sources. Similar estimates have been made for other parts of the West.

Although water markets may increase overall economic efficiency, the economic impacts on individual communities may be positive or negative, depending on the situation. Many water professionals maintain that significant economic and other losses may be experienced in some localities. If agricultural land is taken out of production to transfer water to an urban area, local economic impacts could include reductions in farm income, the dislocation of farm workers, and reduced tax revenues. The farms that remain may be insufficient to support the local suppliers and processors of agricultural products, and these businesses may fail. The local economy may decline as other businesses fail, the population decreases, and the area becomes less attractive to new businesses.

These kinds of impacts are the ripple effects that result from any change in the economy: Overall economic efficiency may improve because of the change, but there are winners and losers. With water transfers, overall economic efficiency may improve, but some rural communities may lose. For example, economic studies of water sales from farms in the Arkansas River Valley to cities on the Front Range of Colorado estimated declines in local employment and income, despite a net benefit statewide.[7] Similarly,

[7]Charles W. Howe, Jeffrey K. Lazo, and Kenneth R. Weber, "The Economic Impacts of Agriculture-to-Urban Water Transfers on the Area of Origin: A Case Study of the Arkansas River Valley in Colorado," American Journal of Agricultural Economics (Dec. 1990), pp. 1200-1204.

the estimates of the impacts of transfers from rural counties in Arizona to urban areas and others indicated declines in local employment, income, and government revenue in some local communities.[8] These impacts are likely to be concentrated in sensitive areas, such as those in which the economy of the area selling the water is depressed, the sales proceeds are not reinvested in the community, or the sales proceeds are used only to pay off existing debt.

Conversely, if agricultural water is conserved through improved irrigation and agricultural production continues or if the proceeds from the sales are reinvested within the community, the local economy can benefit from the sales and the effect will be positive. For example, agricultural water sales to the Intermountain Power Project in Delta, Utah, allowed farmers to reduce debt and purchase homes and equipment.[9] The funds from the water sales remained in the local area, and the power plant provided jobs and increased the tax base. One type of transfer with potentially beneficial impacts is the dry-lease option, in which an urban area pays farmers for the use of their water supplies under certain conditions, such as in dry years when other supplies are low. In these dry years, farmers do not grow crops but receive money from leasing their water; in normal years, they farm. With these arrangements, farming continues to support the local economy over the long run, and farmers increase their revenues from the lease of water. In these ways, some transfers can improve economic conditions in declining rural communities.

According to the National Academy of Sciences[10] and professionals familiar with water markets, in addition to economic impacts, communities can experience social impacts. These impacts include changes in the way of life and local traditions, changes in cultural values and ways of managing water, changes in the community's structure and cohesion, and loss of control over the community's future.

Environmental Conditions Can Decline

While water markets can be beneficial to the environment by reducing the need for new dams and reservoirs, reducing agricultural drainage and runoff, and allowing the purchase of water rights for instream uses, such

[8]Alberta H. Charney and Gary C. Woodward, "Socioeconomic Impacts of Water Farming on Rural Areas of Origin in Arizona," American Journal of Agricultural Economics (Dec. 1990), pp. 1193-1199.

[9]Michael J. Clinton, "Water Transfers: Can They Protect and Enhance Rural Economies?" Natural Resources Law Center, University of Colorado School of Law (June 1990).

[10]Water Transfers in the West: Efficiency, Equity, and the Environment, Committee on Western Water Management, Water Science and Technology Board, Board on Agriculture, National Research Council (Washington, D.C.: National Academy Press, 1992).

as fish and wildlife habitat, some transfers could have adverse environmental impacts. Changes in water use can affect surface water conditions, including instream flow levels, return flows used by wildlife, and reservoir operations. Transfers can also alter groundwater conditions and soil conditions.

Changes in instream flow levels can affect water quality, fish and wildlife populations, and recreation. Figure 2.1 highlights how the instream flow levels can decline at different locations because of transfers. Before the transfer, 230 acre-feet[11] remained instream; after the transfer, only 120 acre-feet remained. Wetlands and streamside habitat can lose water supplies if the streamflow is reduced or the return flows from existing uses are diminished. In this example, incoming supplies from the stream to the wetland are reduced from 115 acre-feet before the transfer to 60 acre-feet flowing in after the transfer. Increasing irrigation efficiency, such as by lining canals, can also eliminate the water seepage that previously supported vegetation or wildlife habitat dependent upon the water. For example, if Farmer 2 increased his irrigation efficiency, he would return fewer acre-feet to the stream and the water available for wetlands and the fish would be diminished further.

Declines in streamflow levels can change the water quality by reducing a stream's dilution capacity and thereby concentrating pollutants in less water. An increased concentration of pollutants can increase municipal water treatment costs to treat the pollution. The declines in streamflow can also result in inadequate stream levels for fish migration. Furthermore, recreation such as fishing or rafting can decline as streamflows are reduced and fish and wildlife populations are harmed. The changes in water levels can allow the remaining water to become warmer, which can be lethal to coldwater fish and eggs. With large transfers, reservoirs can be drawn down quickly, which can diminish water quality and food supplies for fish, eliminate shoreline habitat used by young fish to hide in, and degrade spawning habitat. If the local economy depends on income from recreation, changes in surface water conditions can cause adverse economic impacts.

Transfers can alter groundwater conditions as well. Groundwater problems can occur if individuals replace transferred surface water with increased groundwater use, or if surface water that previously recharged groundwater systems is transferred elsewhere and is no longer available

[11]An acre-foot is the amount of water needed to cover 1 acre of land to a depth of 1 foot—or about 326,000 gallons.

for recharge. Groundwater overdraft problems can occur as groundwater withdrawal exceeds recharge to the underground aquifer. In some cases, land subsidence (collapse) can occur because of groundwater removal. The declines in groundwater levels can also increase groundwater pumping costs, as water must be pumped from deeper levels. If the levels decline far enough, it may be necessary to replace pumps or deepen wells throughout the groundwater basin, imposing financial costs on water users. Where groundwater and surface water systems are connected, pumping can diminish the water quality in coastal areas by encouraging seawater to intrude into the aquifer. Furthermore, depleted aquifers can lower the water table levels, drying up wetlands and affecting other wildlife habitat.

Undesirable soil conditions can develop if agricultural water is sold and farmland is retired. Soil erosion, blowing dust, and weed growth may become problems. The revegetation of abandoned farmland in arid areas can occur very slowly, and large barren areas where no vegetation can establish itself can occur if the arid land becomes crusted over. In other cases, tumbleweeds can quickly dominate the land in the first stage of revegetation and may exclude more desirable species.

Actual Impacts Will Vary

The impacts of each water transfer will differ, depending on the unique characteristics of the transfer, the conditions of the local economy and culture, and the sensitivity of the local environment. It is unlikely that all of the potential adverse impacts associated with transfers will occur for any given transfer, and transfers can also have positive third-party impacts, in addition to their direct economic and environmental benefits. For example, transfers of water to new areas can generate new jobs in those locations.

Whatever the impacts of a water transfer may actually be, many professionals we spoke with who are involved in facilitating water transfers state that the perception and fear of negative impacts in a community can create opposition and obstacles to transfers and, in some cases, prevent transfers from occurring.

Addressing Impacts on Third Parties

Adequately addressing third-party impacts before a water transfer is approved is paramount to the future viability of water markets. However, existing procedures at the federal and state levels may not always be adequate to assess the wide array of economic, social, and environmental variables that could be adversely affected by a given transfer. The Bureau of Reclamation relies heavily on the states' procedures for identifying and resolving third-party concerns, but the states' consideration of third-party impacts varies.

We analyzed 14 general strategies for mitigating the adverse third-party impacts of water transfers as a means to more adequately address the impacts. These strategies are used in western states, have been discussed in the academic literature, or have been considered in legislative proposals. On the basis of our analysis, we provide some general observations about choosing strategies for addressing third-party impacts and the effectiveness of the strategies.

Many Adverse Impacts of Water Transfers May Not Be Adequately Addressed

Transfer applicants must satisfy a range of requirements at the federal and state levels to obtain approval for transfers of federally supplied water. Many of these requirements address the potential third-party impacts of transfers. However, while federal environmental laws can protect against some adverse environmental impacts, others may not be addressed. Furthermore, in reviewing transfers of water provided from federal projects, the Bureau of Reclamation relies on the states to address many third-party concerns. All states examine the impacts of proposed transfers on individual water rights, but the states vary in the extent to which they review proposed transfers for other potentially significant impacts, such as those on local communities or environmental values.

Transfer Applicants Must Satisfy a Range of Requirements

To transfer water provided from federal facilities, a transfer applicant must satisfy federal approval requirements. Transfers that involve a change in the states' water rights must also satisfy the states' transfer requirements.[1] In 1988, the Department of the Interior issued its principles to govern voluntary water transactions that involve or affect the facilities owned or operated by Interior. The policy indicated that Interior will serve as a facilitator for water marketing proposals between willing buyers and sellers that satisfy certain principles. Subsequently, the Commissioner of

[1]Not all transfers of federal project water involve a change in a state water right. These transfers may require federal approval, but not state approval. For example, transfers of federal project water that occur within the boundaries of the federal project may not constitute a change in the state water right that was appropriated for project use.

the Bureau of Reclamation issued criteria and guidance to assist the regional directors in implementing each of Interior's principles. In general, the Bureau must consider all federal laws, including those concerning project repayment obligations, authorized project uses and boundaries, and environmental requirements. The Bureau also must consider the impact of the transfer on project operations and deliveries to other water contractors.

The states' procedures vary. Often, the transfer applicant must demonstrate that the water to be transferred has been consumed or used historically. The states usually require some form of public notice that an application has been filed to alert anyone who might have an interest in the outcome of the transfer. Objecting parties may file protests. Often these protests are made by other holders of water rights who claim injury to their rights, and transfer applicants may have to demonstrate that other rights holders will not be injured by the transfer. Other requirements may also have to be met, depending upon the states' laws, to address potential third-party impacts. Both federal and state water agencies may deny, approve, or approve the transfer with modifications to comply with requirements.

The approval requirements can affect the applicants' incentives for transfers because the applicants can incur transaction costs in obtaining approval for transfers. The transaction costs include the costs of technical and legal work that must be done to successfully complete a transfer. Sellers will not agree to a transfer unless the price they receive for their water compensates them for returns forgone in using the water themselves, plus any transaction costs they incur. Thus, the transaction costs affect the profitability of a transfer and can impede transfers if they are so high that the potential profit is significantly reduced or eliminated.

In addition, if approval requirements are unclear, buyers and sellers will be uncertain about what requirements must be met. Because of this uncertainty, they cannot form secure expectations about whether their transfers will be approved or whether they will be profitable once they are approved. Such uncertainty discourages transfers. When the approval requirements are clear, transfer applicants can focus their resources on satisfying the necessary criteria, which can reduce the transaction costs, uncertainty, and delays.

Federal Environmental Requirements May Not Address Some Impacts

Some environmental impacts of transfers may be addressed under the variety of federal environmental laws enacted to maintain environmental quality and protect natural resources. However, our review of the environmental laws potentially affecting water transfers suggests that some potential impacts may be addressed under some environmental laws, but others may not.

The National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321), acts as an umbrella environmental law governing certain federal actions, including the approval of water transfers. The Bureau's transfer guidelines indicate that, to address potential environmental impacts, transfers must be in compliance with NEPA. However, the extent of the environmental review required under NEPA varies greatly, and how NEPA is implemented can determine whether or not the environmental impacts of water transfers are addressed.

NEPA requires that an environmental impact statement be prepared for all discretionary major federal actions significantly affecting the quality of the human environment. The impact statements examine the likely environmental impacts, discuss the alternatives to mitigate the impacts, and indicate how federal actions comply with the relevant federal environmental laws. However, if a particular water transfer is not considered to be a major federal action with significant impacts, an environmental impact statement is not required.[2] Furthermore, NEPA is a procedural law that, by itself, does not require federal agencies to take any specific action to avoid the impacts identified; it requires only that the appropriate studies be completed and that the impacts that may trigger other environmental laws be identified.

Actions that are considered to have little or no impact are categorically excluded from NEPA's environmental impact statement requirement. For agencies within the Department of the Interior, these actions include routine administration and operation and maintenance activities. Actions that are categorically excluded often are reviewed under a categorical exclusion checklist, which asks nine questions about the potential environmental impacts of the proposed action, including whether any environmental laws would be violated by the action. If the answer to any question is yes, additional information may be necessary to determine whether environmental assessments or environmental impact statements need to be done.

[2]Environmental assessments can be used to determine whether the environmental impacts are likely to be significant, and therefore whether environmental impact statements are necessary.

Interior's and the Bureau's NEPA guidance does not specifically refer to water transfers nor identify categories of transfers on the basis of type, size, or term length that might be of environmental concern. Therefore, the requirements for NEPA compliance currently depend on whether the Bureau considers a particular transfer to be (1) a type of action that is categorically excluded or (2) an action that requires environmental review within the general categories outlined in the NEPA guidance. For example, according to Bureau officials, transfers among contractors in the Mid-Pacific Region's Central Valley Project are categorically excluded from further review because Bureau officials consider such transfers to be part of project operations.

Other environmental laws can provide some protection in certain circumstances, depending on how they are applied. However, the existing federal environmental laws were not specifically designed or coordinated to address the range of potential adverse impacts associated with water transfers. For example, under the Endangered Species Act, federal agencies must ensure that proposed actions are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. Federal agencies would have to ensure that the approval of a transfer did not violate the Endangered Species Act. In addition, flow releases or bypass flows may be required as a condition for federal licensing of hydroelectric dams by the Federal Energy Regulatory Commission. Water transfers could not change such releases without violating the license. Transfers involving the discharge of dredge or fill activities would require permits under section 404 of the Clean Water Act, which involves a broad public interest review by the Corps of Engineers. However, protection under these laws is limited to those transfers that fall within the narrow scope of each law and would not apply to many transfers with other adverse impacts.

States' Transfer Requirements Vary and May Not Address Some Impacts

According to the Bureau's criteria for approving water transfers, the Bureau relies primarily on state forums for identifying and resolving disputes over third-party impacts. The identification of these third parties, the validity of their concerns, and the satisfaction of those concerns rests with the states. The Corps of Engineers does not have a stated water transfer policy or guidance but focuses its review of proposed transfers on satisfying federal laws and maintaining project operations. Consideration of other impacts depends on states' reviews. Yet, while all states review proposed transfers for their impacts on other holders of water rights, the

states' reviews of other third-party impacts vary. In some states, the effects that water transfers may have on such factors as local economies, fish, wildlife, and recreation can be considered when the transfer proposals are evaluated. In other states, many potential environmental or local community concerns are not addressed.[3]

Objecting parties may protest proposed transfers by filing protests, and often these protests are made by other rights holders claiming injury to their water rights. In some states, such as Colorado, injury to water rights is the only basis for which parties have the standing to file a protest. Other community and environmental interests do not have the standing to formally protest a transfer.

Public interest provisions governing water allocation in many states can allow for broader concerns, such as community or environmental impacts, to be addressed in the approval process. The states with these provisions may disallow a transfer if it is not in the public interest. While some states, such as Nevada, New Mexico, and South Dakota, require that transfers be in the public interest, the public interest is not statutorily defined. In these states, the public interest may be determined largely through court decisions or on a case-by-case basis. Therefore, it may be uncertain which potential impacts will be considered in a given transfer and how they will be balanced against the benefits of the transfer. In other states, such as North Dakota, Alaska, and Idaho, the public interest has been more clearly defined and includes the consideration of the effects of a proposed transfer on economic activity, on fish and wildlife, on the loss of alternative uses of the water, and of harm to others. In contrast, Colorado has no public interest requirement governing transfers.

In addition, states' instream flow laws can protect some instream flow values from the negative impacts of transfers. For example, some states, such as Oregon and Washington, have passed laws allowing the establishment of minimum flow regimes on some streams and lakes. Minimum flows condition future uses of the water on maintaining the minimum flow level. Therefore, water transfers that deplete the streamflow below minimum levels may not be allowed. Such states as Alaska and Montana allow the withdrawal or reservation of unappropriated water for instream uses, and many states, including Colorado and Idaho, allow the appropriation of instream flow rights. The

[3]The information we obtained about the states' water laws was based on summaries provided in reports, books, and journal articles prepared by lawyers, economists, and state officials. We did not independently verify the current status of all state laws, although we did verify the status of the laws of states specifically mentioned in the report. We recognize that state laws have been changing.

establishment of water rights for instream purposes not only provides opportunities to maintain instream flows through appropriations or purchases, but also provides a legal basis for the instream rights holder to protest proposed transfers that affect the instream rights. However, minimum flows, reservations, and instream flow rights do not apply to all streams and rivers, are not used in all states, and do not protect all instream values.

Adverse impacts have occurred, in some cases, under the states' laws and procedures. For example, the National Academy of Sciences reported that transfers of water from agricultural areas in the Arkansas River basin of Colorado to urban areas in Colorado have contributed to local economic and environmental problems. Agriculture, the primary economic base of this area, has been declining since the 1960s as water has been transferred to cities. The population decline has accelerated, and there has been little reinvestment of the transfer proceeds into the local area. The wildlife habitat and wetlands that relied upon irrigation development have been eliminated, and transfers of water upstream have reduced the amount of water available for fisheries, habitat, and recreation. Colorado's instream flow program provides limited protection of instream flows in the Arkansas basin, but instream flows have not been established in many locations and for many instream values.

According to the National Academy of Sciences, in general, the states' transfer processes inadequately address the third-party impacts of transfers. The Academy's June 1992[4] report on third- party impacts associated with water transfers stated that a serious problem with the transfer process is that some interests historically have been left out of the decision-making process used to allocate water, including rural communities, ethnic minorities, fish and wildlife and their habitats, and the public. According to the Academy, states are changing their laws in a variety of ways to respond to demands for broader public representation in water transfers, but evaluations of the interests of third parties in water transfer activities in the West remain incomplete.

[4]Water Transfers in the West: Efficiency, Equity, and the Environment, Committees on Western Water Management, Water Science and Technology Board, Board on Agriculture, National Research Council (Washington, D.C.: National Academy Press, June 1992).

Strategies to Mitigate the Adverse Impacts of Water Transfers Vary in Their Effectiveness

We examined whether 14 strategies used in western states, discussed in the academic literature, or considered in legislative proposals, would address the third-party impacts of transfers. The overall objective of water transfer policies involves balancing two goals: adequately mitigating adverse impacts on third parties without unnecessarily preventing beneficial transfers from occurring—either through outright prohibitions or cumbersome impediments. For our analysis, therefore, we examined whether 14 strategies address the two general policy goals of addressing the transfers' impacts on third parties and minimizing the impediments that the strategies can add to the approval processes.

The first policy goal involves addressing the economic and social impacts described in chapter 2 and maintaining environmental surface water, groundwater, and soil conditions. The strategies were considered effective if they (1) account for the significance of the impact and reduce the impacts to acceptable levels or (2) maintain environmental conditions at acceptable levels.

The second policy goal addresses the additional impediments that buyers and sellers may have to face if the strategy is implemented. In general, strategies for addressing the third-party impacts of water transfers can add impediments to transfers by increasing the transaction costs, the time required to effect transfers, and the uncertainty about whether and how a transfer will occur. Such strategies can also prohibit some transfers from occurring, regardless of the value of the transfer to the buyers and sellers, preventing water from going to an economically higher-valued use. These impediments occur primarily because adopting strategies adds requirements to the approval process. Transaction costs, delays, and uncertainty can impede and discourage transfers: Transaction costs reduce profitability, uncertainty prevents applicants from knowing the financial outcome of the transfer, and delays add to costs and decrease tolerance for uncertainty. These factors all reduce the appeal of transfers. For our analysis, we determined the positive and negative aspects of each strategy on the basis of the extent to which it reduced additional impediments to transfers.[5]

Conversely, depending on the circumstances, strategies can reduce impediments if they allow the parties to avoid more costly, time-consuming, and uncertain forms of protest, such as litigation against transfers in courts or the adoption of legislation to stop a transfer. We did

[5]These positive and negative aspects flow from the perspective of buyers and sellers wishing to transfer water. They do not necessarily reflect positive and negative aspects from the perspective of overall efficiency or societal concerns.

not consider whether more costly forms of protest were available to third parties. The strategies we examined are listed in table 3.1.

Table 3.1: The Strategies GAO Analyzed

Strategies
1. Require public interest review
2. Perform a comprehensive impact assessment
3. Compensate the community
4. Rely on ad hoc negotiation
5. Institute a right of first refusal
6. Rely on irrigation or water district veto power
7. Provide local governments with veto power
8. Rely on district veto power with criteria specified
9. Require comprehensive planning to identify public interest
10. Establish minimum streamflow and lake level standards
11. Limit overall amount of water to be transferred out of area
12. Prevent or limit fallowing of agricultural land
13. Rely on zoning to prevent transfers from sensitive areas
14. Tax the transfers

The results of our analysis are based on our review of the literature and interviews with water market professionals as well as on responses provided by outside reviewers. We first reached tentative conclusions about the impediments that each strategy would add to the transfer process and the impacts that each strategy would address. We then asked 35 professionals with experience in water markets to review our analysis and conclusions and rate each strategy in terms of its effectiveness in addressing third-party impacts; 23 responded. The reviewers indicated whether they agreed with our conclusions on (1) each strategy's general effectiveness in addressing third-party impacts and (2) the impediments each adds to transfers.

While most reviewers generally agreed with our analysis, many qualified their agreements with comments indicating exceptions to some general conclusions and expressing concerns about the implementation of some strategies. We summarized those ideas expressed by more than one reviewer in our discussion of each strategy and revised our conclusions on the basis of reviewers' responses, where appropriate. Reviewers also rated each strategy as excellent, good, fair, or poor in addressing some third-party impacts. A general overview of our strategy analysis is provided below. Descriptions of each strategy, the results of our analysis

for each strategy, and the comments made by reviewers are provided in appendix I. The reviewers who commented on our analysis are listed in appendix II.

Overview of Results

Our analysis indicates that the strategies vary in their effectiveness in addressing certain third-party impacts and in the impediments they add to the transfer approval process. Moreover, each transfer situation is unique, and strategies may effectively address certain impacts in some circumstances but not in others.

The 14 strategies generally fall into five categories. The categories are based on the impediments that the strategies can add to the transfer approval process; but their effectiveness in addressing third-party impacts varies greatly within the categories. Strategies 1 through 5 in figure 3.1 generally do not prohibit certain transfers from occurring outright; they allow flexibility in transfer terms and conditions to allow transfers to occur if changes can address identified third-party concerns. However, these strategies can add significant transaction costs, time, and uncertainty to the approval process. For example, under public interest review, the reviewing agency can approve a transfer on the condition that the transfer terms are modified to address identified third-party impacts, rather than prohibit the transfer because of impacts. Similarly, comprehensive impact assessments can identify alternatives to mitigate the impacts but still allow the transfers to occur. But such extensive review and study to identify third-party impacts can be costly and time-consuming.

The effectiveness of addressing various third-party impacts varies among these strategies. For example, the extensive review of impacts under public interest review can be effective in addressing the wide range of third-party impacts, so long as all third parties are given the opportunity to participate and the definition of "public interest" includes all impacts. But the effectiveness of public interest review and comprehensive impact assessment depend in part on the standards for decision-making. These standards include such factors as whether transfers can be approved only if the impacts identified are mitigated.

Compensation to the community may be less effective in some cases because many impacts cannot be addressed monetarily, including unquantifiable social values, such as lifestyle, and environmental changes. Yet, in other cases, compensation can help address these impacts, such as

through new social services or new jobs and sources of community pride. Similarly, if compensation is used to purchase replacement water or mitigate environmental harm, then surface and groundwater impacts may be mitigated, in some cases. (Descriptions of strategies 1 through 5, the results of our analysis, and the comments made by reviewers are provided in app. I.)

The impediments added under strategies 6 and 7—district and local government veto power—can vary, depending on whether or not criteria for vetoes are clearly established. If criteria are clearly established, additional costs, delays, and uncertainty will be reduced. Conversely, if criteria are unclear, these strategies can add transaction costs, delays, and uncertainty. If criteria are rigid, such as in the types of transfers that will be prohibited, some transfers may be prohibited outright, regardless of the value to the buyers and sellers.

The effectiveness of these strategies in addressing various third-party impacts differed. Water and irrigation districts, which were established for the benefit of a specific group of water users, such as irrigators, do not represent the public and do not consider all interests. While local governments may be more likely to represent a broader range of public interests, both districts and local governments may lack the expertise necessary to address certain impacts, such as environmental impacts, and may limit their area of concern to their local jurisdictions, not addressing the overall interests of the region or state. (These strategies are discussed in more detail in app. I.)

Strategies 8 and 9—district veto power with the criteria specified and comprehensive planning to identify the public interest— can reduce the transaction costs and be more timely and certain than the district veto power and the public interest review, because the approval criteria are more specifically identified beforehand. However, depending upon how rigid the criteria are, these strategies can prohibit certain transfers outright, regardless of their value to the buyers and sellers.

Theoretically, if planning is comprehensive and if the districts' criteria specify that all community and environmental concerns are included, then all third-party impacts can be addressed. However, the reviewers indicated that it is difficult to ensure that all third parties are involved in developing plans. They also expressed doubts that the districts could change their focus so significantly to protect the third-party interests that do not

involve their members. (These strategies are discussed in more detail in app. I.)

Strategies 10 through 13 generally have limited transaction costs, delays, and uncertainty because they establish specific criteria that hold for all transfers. Transfer applicants must only demonstrate to the reviewing agency that their transfers satisfy the criteria established. For example, with minimum streamflow requirements in place, transfer applicants must demonstrate that their transfers do not reduce streamflows below the minimum levels allowed. However, these strategies can prohibit transfers that do not meet the criteria, regardless of the transfers' value to the buyers and sellers. For example, if limits on the overall amount of water to be transferred out of the area are established, once the limit is reached, additional transfers cannot occur, regardless of how valuable they may be.

These strategies varied greatly in their effectiveness in addressing third-party impacts. For example, minimum streamflows or lake levels can be effective in protecting certain surface water conditions, but they may address only those economic and social impacts that are associated with recreation, tourism, or aesthetics—not those associated with agricultural decline. Preventing or limiting fallowing of agricultural land may address economic and social impacts in agricultural communities, but they also may limit the economic benefits of transfers in declining communities. (Descriptions of strategies 10 through 13, the results of our analysis, and the comments made by reviewers are provided in app. I.)

Strategy 14, taxing transfers to address adverse impacts, adds costs to transfers in the form of the tax owed. However, pre-established taxes that hold for all transfers do not add time or uncertainty to the approval process. Taxes do not directly prohibit any transfers from occurring—so long as the taxes are paid—but may effectively preclude some transfers that are only marginally profitable without the tax. As with compensation, taxes can address only those impacts to which proceeds are dedicated, and some social and environmental impacts can never be addressed monetarily. (Strategy 14 is discussed in more detail in app. I.)

General Observations About Strategies

It is difficult to generalize about the effectiveness of particular strategies; each transfer is unique, and not all options effectively address all impacts under all circumstances. In addition, how the strategies are implemented is key to determining their effectiveness. Implementation can include such issues as the standards for decision-making, how compensation or

mitigation is applied, and the competence of the institutions carrying out strategies. For example, how are various impacts balanced in determining whether a transfer should be approved, and are transfer approvals contingent upon mitigation of all impacts? Who is compensated and who determines how funds are spent or impacts mitigated? Can the institution represent all interests? Is it capable of making informed decisions about all impacts?

While it is difficult to generalize, we can make observations about strategies with certain characteristics. The strategies that ensure that all interested parties or their representatives can participate or are considered in the approval process are more likely to address the full range of third-party impacts. Moreover, monetary solutions, such as compensation and taxes, cannot address all impacts, particularly some social and environmental impacts, although in some cases monetary solutions can help mitigate those impacts.

In addition, the strategies that clearly specify approval criteria can reduce additional impediments, because transfer applicants can focus their resources on satisfying the specified criteria and can form reasonable expectations about the outcome of the review process. Rigid criteria, such as limits that cannot be exceeded, also reduce such impediments as transaction costs, delays, and uncertainty, but they increase the chances that some transfers will be prohibited regardless of the net benefits of the transfer. In contrast, the strategies that increase flexibility—by allowing changes in transfer conditions to address impacts—increase costs, delays, and uncertainty. But it is less likely that these strategies will prohibit transfers, unless they have significant adverse impacts.

A Combination of Strategies Will Be Needed

While not all options effectively address all impacts under all circumstances, most strategies provide some benefits under certain conditions and may be desirable in those cases. To address the wide range of third-party impacts effectively, while avoiding overly burdensome processes that add substantial impediments, decisionmakers will need to rely on a combination of strategies. The strategies should be considered in conjunction with one another in determining their desirability.

Several key factors need to be considered in choosing appropriate strategies. The existing approval processes in the states vary and affect whether certain strategies are necessary. Some impacts currently are addressed under existing state laws and policies, while others are not. If

impacts currently are adequately addressed, additional strategies to address these impacts may not be necessary.

Local economic, social, and environmental conditions and concerns vary as well and determine which impacts may be of concern. For example, one area may have a strong, diverse economy unlikely to be affected by transfers, while another area may be highly dependent on current water uses. Similarly, sensitive environmental conditions, such as overdrafted groundwater aquifers, may be limited to certain areas and may not be a concern for transfers in other areas. If certain factors are not a concern, no strategy is necessary to address them.

A key issue for decisionmakers is determining which impacts should be addressed and which should not. Many market transactions, not just water transfers, have economic impacts on third parties; any change in the economy has ripple effects in which some parties will lose economically, while others win. Yet the impacts of most market transactions in the overall economy are not mitigated. While most water experts agree that water is unique because of the nature of its impacts, decisionmakers must determine which economic impacts resulting from transfers should be addressed.

Moreover, the resolution of some problems transcends water transfers and may be better addressed under other regulatory forums. For example, groundwater management involves the consideration of many factors other than water transfers. A comprehensive approach to managing groundwater resources may be more desirable than relying on water transfer policies to mitigate some impacts. Similarly, the economic decline and vulnerability of some agricultural communities has many causes unrelated to water transfers. It may be more preferable to strengthen communities through other economic policies than to limit or condition water transfers. Constraining transfers to protect current water uses may reduce opportunities for improving the economies of depressed local communities.

The type of transfer affects which strategies are appropriate as well. Some transfers are not likely to cause some impacts. For example, transfers that do not involve retiring farmland may not create new soil problems. Some transfers are sensitive to delays and high transaction costs, such as temporary transfers that must be approved for the current growing year and small transfers with small profit margins. These transfers may require quick, inexpensive approval processes if they are to occur, and strategies

that add few additional impediments may be the most appropriate choices, so long as they address the associated impacts. Conversely, those transfers with greater potential for causing significant adverse impacts, such as long-term and large transfers, may justify greater scrutiny and subsequent costs, delays, and uncertainty.

For example, the establishment of minimum streamflows might be a quick and inexpensive approval criteria for small, temporary transfers that are likely to alter streamflow. But additional strategies might be necessary, such as public interest reviews, for large and long-term transfers with potentially greater impacts, where delays and transaction costs may be justified and have less impact on transfer profitability. Similarly, combinations of many small transfers may have cumulative impacts that warrant greater attention than the first few small transfers.

In summary, choosing the appropriate strategies for addressing third-party impacts is very site-specific. It requires the consideration of local economic, social, and environmental conditions and the recognition of existing strategies and their effectiveness. A combination of strategies will be needed not only to address the wide range of third-party impacts, but also to accommodate the characteristics of different types of transfers—such as whether they are small or large, temporary or long-term, and are likely to generate certain impacts.

Federal and State Roles in Addressing Third-Party Impacts

Our analysis did not distinguish whether the strategies would be implemented at the state or federal level; rather, we examined the effectiveness of the option, if implemented, at any governmental level. Currently, the states' water allocation laws and procedures generally govern the approval of water rights transfers, and the federal government plays a role primarily by ensuring that existing federal laws are satisfied when transfers of federally provided water occur. New federal directives governing such transfers could affect the states' existing levels of control. While some states' procedures may inadequately address the third-party impacts of transfers from federal facilities, federal denial of proposed transfers because of the impacts on third parties, such as local communities, might be viewed as interference with the states' decisions on water allocation.

The national bipartisan body created by the Congress to represent federal, state, and local governments—the Advisory Commission on Intergovernmental Relations (ACIR)—stresses a limited federal role in

water management. ACIR recommended that the federal government become a more effective partner in helping solve the nation's water problems by recognizing, accepting, and relying on the states', tribes', and local governments' determinations of their water needs and administrative structures that can provide sound environmental protection. According to ACIR, the states have the proximity to and the first-hand knowledge and understanding of water problems. The federal government should concentrate direct federal actions on those goals that clearly can be addressed best by the national government.

Similarly, the National Academy of Sciences concluded in its 1992 report that state and tribal governments historically have had primary responsibility for the administration of water rights and should have the primary responsiblity for water transfers, although federal intervention may be necessary when an overriding national interest exists.

The states' laws have been changing to recognize a wider range of water values and to consider public interest concerns, such as environmental and community concerns, in the approval processes for water transfers. But changes have been uneven. The Western Governors' Association issued reports in 1986 and 1987 addressing the use of water markets to improve the efficiency of water use.[6] In its reports, the association encouraged states to promote measures to protect the public interest during transfers. The Western Governors' Association and the Western States Water Council also have held workshops in recent years to clarify emerging public interest considerations in water and to explore how states should respond to these interests.

[6]Water Efficiency: Opportunities for Action, Report to the Western Governors from the Western Governors' Association Water Efficiency Working Group, July 6, 1987; and Western Water: Tuning the System, Report to the Western Governors' Association from the Water Efficiency Task Force, July 7, 1986.

Issues to Address in Implementing Water Markets: State and Federal Water Rights

Economic theory indicates that markets function best if buyers and sellers can form reasonable expectations of the returns for their efforts. Consequently, effective markets require clear, secure property rights to define and limit the rights to the water being transferred and to allow holders of water rights to form expectations about the value of their rights. However, some states' water rights laws threaten sellers' water rights if transfers are proposed, and others restrict access to the market for instream uses. Because of the complex relationships among the water users, the districts, and the Bureau, water users who receive water from federal projects often do not have the legal authority to initiate transfers. In addition, many Indian tribes hold unquantified reserved rights for water that predate many water rights held by non-Indians under state appropriation laws. Neither the Indians nor non-Indians know with certainty the nature of the tribes' water rights, and it is unclear to what extent federal law or state law governs the transfer of this water.

State Water Rights Laws Can Affect Transfers

The states' water laws play a significant role in transfers of water from federal projects; federal laws recognize the states' primacy in the allocation of water rights unless the state laws conflict with a clear congressional directive. As a result, state laws have jurisdiction when federal laws are silent. We recognize that water laws vary among states. Our review focused on the aspects of water law that are common to many western states and can impede water transfers. We did not examine the issues related to interstate transfers of water.

The Prior Appropriation Doctrine

Under the states' prior appropriation doctrine, holders of water rights risk losing their rights to any water conserved if they propose transfers. The "use-it-or-lose-it" doctrine of the prior appropriation system can discourage water conservation and transfers of water in some states, because those who conserve the water, such as by installing more efficient irrigation systems, may not have any right to use or sell the water they conserve. Successful conservation and transfer of water may be seen as evidence that the user did not beneficially use all of the water appropriated. Some believe that in order to encourage conservation and transfer of water, laws must clearly state that users conserving water have the right to use or transfer the water and that conservation and transfer are beneficial uses of water.

Some states, such as Oregon and California, have passed legislation allowing conserved water to be transferred. The California water code

specifically provides that conserved water may be sold, leased, exchanged, or otherwise transferred and that conservation of water constitutes a beneficial use.

Instream Rights

Some instream environmental and economic benefits of water markets may not be realized, because many state laws do not recognize some instream uses as beneficial uses and do not allow for the purchase of water rights for instream uses. Others limit such purchases to state agencies. The state laws that do not recognize some instream values as beneficial uses, or that restrict instream flow appropriations and purchases to state agencies, limit the effectiveness of the market by preventing some potential purchasers from participating in the market for instream values.

For example, New Mexico does not recognize most instream uses as beneficial uses of water. While recreation and fisheries are considered beneficial uses, permits for such uses can be obtained only if the water is diverted from the stream—for example, to a reservoir. Similarly, Wyoming recognizes instream uses for maintaining fisheries but not for other instream values. The instream water uses that are not considered beneficial are not recognized as property rights, cannot be bought or sold, and can be appropriated for other uses.

Some states allow state agencies to appropriate, purchase, or acquire instream flow rights. However, few states provide private parties and other government agencies with this opportunity. Only a few states, including Alaska, Arizona, and California, allow private parties to hold water rights for the purpose of maintaining instream flows, although in at least one state, Colorado, private parties can donate instream rights to the state. Similarly, in only a few states, such as Alaska and Arizona, can the United States hold an instream flow right not associated with a diversion of water. The purchase of water rights for instream uses by private parties could complement public agencies' instream protection efforts without requiring public expenditures and would more directly indicate the value that private parties place on instream uses.

Some states have limited instream rights to state agencies because they fear speculation, in which private parties obtain instream flow rights and later sell them for consumptive uses at a profit. They also fear that private purchases of instream rights would constrain other beneficial uses of water in the future and hinder development. Speculation might be avoided

by allowing private purchases for instream rights if the rights subsequently are donated to public resource agencies to maintain. Alternatively, agencies could disallow resale or require that applicants substantiate the instream benefits and require approval for any subsequent transfer of established instream flow rights. If instream rights are allowed to be resold, other beneficial uses in the future would not be prevented, although instream protection would be more tenuous. Economic theory indicates that expanding the market to include all potential purchasers increases the efficiency of the market by ensuring that water goes to its highest economic use over time. If water rights are purchased for instream uses at market value, then economic theory indicates that these uses are valued at least as highly as other beneficial uses.

Rights to Bureau-Provided Water Are Complex

Three parties are involved in water rights from the Bureau of Reclamation's projects—the Bureau, state-established water and irrigation districts, and individual users. The complex relationships among these parties in connection with water rights may create disincentives to transfer water.

In some reclamation projects, the water rights are held by water and irrigation districts directly. In many projects, however, the Bureau obtained the appropriative water rights from the states to store, divert, and use water in its projects and thereby holds the legal appropriative right to the water. The Bureau then contracted with water and irrigation districts for the delivery of the water, giving the districts a contractual right to the water that they hold in trust for the irrigators. The districts deliver the water to their individual users, who apply the water to beneficial use, giving them an equitable right to the water.

The U.S. Supreme Court has ruled that under the prior appropriation doctrine, the water rights for federal project water are vested in the water user—not in the federal government that appropriated the water from the state—because the user applies the water to beneficial use on the land.[1] Beneficial use is the basis for water rights under reclamation law.

[1]In Ickes v. Fox (300 U.S. 82 (1937)), the Court ruled that water rights were not vested in the United States, even though the United States appropriated the water under state water law. The court ruled that appropriation was made not for the use of the government, but for the use of the landowners, and the water rights became the property of the landowners. In Nevada v. United States (463 U.S. 110 (1983)), the Supreme Court ruled that the individual landowners held the water rights for the federal Newlands Reclamation Project in Nevada, not the federal government, because the landowners applied the water to beneficial use on their lands.

While water and irrigation districts do not apply the water to beneficial use, they usually hold the contracts with the Bureau for the delivery of water. If a contract is amended and the delivery schedule is changed to allow a transfer, the district must agree to amend the contract. As a result, the districts retain the power to request transfers of water from the Bureau.[2] The relationships between irrigators and their districts can vary and generally are determined by state laws. For example, some states require districts to approve transfers outside of the district proposed by individuals.

In contrast to the Bureau, the Corps of Engineers does not hold water rights. It contracts with the holders of water rights for storage space in its reservoirs. These water rights holders may be water districts, individuals, or municipalities.

Some economists and environmentalists view water and irrigation districts as impediments to water transfers. They believe that individuals should have direct incentives to transfer water—individual farmers, not districts, make the decisions affecting water use, such as what to grow and whether to invest in water-saving technology. But the districts have control over proposing transfers to the Bureau. Some who believe that districts are an impediment to transfers maintain that, as institutions, the districts will try to maintain their power by keeping as much water as possible, thereby preventing individuals from making transfers outside of the district.

The Bureau may also impede transfers by attempting to exert its control over water rights. Many transfers of water from the Bureau's projects, particularly long-term transfers, require contract amendment. In these cases, sellers must obtain the Bureau's approval to amend their contracts and to deliver their water to the buyers. An official from Interior's Office of the Solicitor told us that, with long-term transfers, the Bureau may attempt to take some of the water back into the Bureau's available water supply and reallocate the water itself. However, if water is reallocated to someone other than the buyers who negotiated the transfer, the sellers would not realize a benefit from the proposed transfer; they simply would lose their water. If sellers cannot realize some benefit from transferring their Bureau-provided water, they have no incentive to propose transfers. Similarly, prior to passage of the Central Valley Project Improvement Act, officials from the Bureau's Mid-Pacific Regional Office indicated that if

[2]The Central Valley Project Improvement Act provides authority for transfers of CVP water. According to the Bureau's Mid-Pacific Region, the act provides the authority for transfers without amendments to existing contracts and authorizes individuals within districts to transfer their entitlements of CVP water under the districts' contracts.

repeated temporary transfers had been requested, the Bureau might have questioned whether the contractors have a real need for the water and therefore whether it is being beneficially used. While the act now indicates that transfers are a beneficial use of CVP water, such questions can raise fears among those who use water from other projects about the security of their water rights if they propose transfers of Bureau-provided water.

Extent of Reserved Indian Water Rights Unknown

Some Indian tribes hold unquantified reserved rights for water that predate many water rights held by non-Indians under the states' appropriation laws. These rights were confirmed by the U.S. Supreme Court in Winters v. United States (207 U.S. 564 (1908)), which established the doctrine that, when Indian reservations were established, the tribes and the United States implicitly reserved sufficient water to fulfill the purposes of the reservations—principally agriculture. Because these reserved rights date from the creation of the reservation, they are typically the most senior and thus the most valuable rights. The selling or leasing of tribal water rights may be a means for realizing the economic benefits of water and improving economic conditions on reservations.

However, neither Indians nor non-Indians know with certainty the nature of Indian water rights, because many Indian reserved rights have not been quantified. Although the Winters decision was handed down in 1908, the federal government continued constructing irrigation projects without defining or protecting the rights that Indian tribes might have had in the waters used in federal projects. The states appropriated water rights to non-Indians for these irrigation projects and other uses under state laws. As a result, water appropriated to non-Indians under state laws in some cases is the same water that was reserved for Indians under federal laws. Some rights have been, and continue to be, quantified through case-by-case litigation, negotiated settlements, and congressional actions. This process in the past has been costly and taken years, or even decades. In the meantime, neither Indians nor non-Indians can make market decisions without clear property rights.[3]

Furthermore, it is unclear to what extent federal law or state law controls the use and transfer of Winters water rights. The Supreme Court has indicated that, although Winters rights were quantified on the basis of the

[3]Reserved rights recognized under the Winters v. United States doctrine also apply to non-Indian federal reservations, such as national forests and parks. Many of these federal reserved rights also have not been quantified. However, these federal reserved rights generally involve water reserved for national parks, forests, and military reservations, rather than water developed in federal water projects, as Indian reserved rights sometimes do.

amount of water needed for irrigation, they are not limited to agricultural use.[4] This may include the leasing of Winters rights to others. However, these issues are still being debated.

Some maintain that Winters rights should be subject to certain state water laws to protect non-Indian users who historically have used the water. However, the application of some state laws would significantly limit Winters rights. For example, the states' water principles of historical use and no injury to other holders of water rights would give tribes rights only to the water they have consumed in the past and the water that would not harm any non-Indian users who held junior water rights. But tribes historically have not been able to use their rights. In addition, because Winters water has been appropriated under state law to non-Indians, numerous junior holders could claim injury and possibly deprive new tribal users of their rights.

Non-Indians also have state permits to use water for irrigation on reservations; however, the extent to which states may regulate water on reservations is unclear. This situation could affect tribal leasing of water rights to non-Indian irrigators on reservations. The states' authority over Winters water that is transferred off-reservation is unclear as well.

Finally, there is a question of whether federal laws allow tribes to lease their Winters water. The Congress has given authorization for the leasing of Indian land subject to approval by the Secretary of the Interior (25 U.S.C. 415). This approval requirement is part of the trust obligation that the United States has to Indian tribes.[5] But some have questioned whether tribes have authority to lease water rights independently from the land, particularly if the transfer is off-reservation. Another act (25 U.S.C. 177) requires a treaty or convention to allow the sale of tribal land. In some cases, the Congress has provided specific marketing authority for Winters rights in Indian water rights settlement agreements. While general legislation confirming tribal rights to sell or lease Winters water would resolve such questions, the federal trust obligation suggests that federal approval may still be appropriate on a case-by-case basis.

[4]Arizona v. California, 439 U.S. 419 (1979).

[5]The federal trust obligation of the United States can be considered an obligation to guard tribal assets against waste, yet promote tribal self-determination. According to the Department of the Interior's Bureau of Indian Affairs in June 1990 congressional hearings, its trust relationship with Indian tribes involves the fulfillment of its solemn duties and responsibilities as trustee of Indian lands, natural resources, and other assets. The Indian Self-Determination and Education Assistance Act of 1975, as amended (P.L. 93-638), implements the federal government's responsibility to Indians through the establishment of an Indian self-determination policy.

Addressing Issues Involving State Water Laws Is Difficult

Federal efforts to increase the efficient use of federal project water—such as by defining conservation and transfer of water as beneficial uses and allowing water to be purchased for instream uses—could be viewed as interference in the states' traditional roles.

The Western Governors' Association has encouraged the states to promote more efficient use of water through changes in the states' laws and procedures related to the conservation of water and institutional measures to facilitate water transfers, but the association stresses a limited federal role. In its reports on water transfers, the Western Governors' Association noted that the best way for the Bureau to help the West improve the efficiency of water use is to facilitate voluntary transfers of Bureau-provided water. It stated that the Bureau's role in water transfers should be limited to ensuring the repayment of federal obligations in water projects and providing technical assistance and information. Furthermore, it stated that the states' primacy over Bureau-provided water should be strengthened so that such water may be incorporated in the states' water management efforts.

Issues to Address in Implementing Water Markets: Reclamation Laws and Policies

Transfers of Bureau-provided water have not been specifically addressed in reclamation law, except in the Central Valley Project (CVP) Improvement Act, which affects transfers only from the CVP in California, and in drought legislation that establishes provisions to transfer water during times of drought. Other reclamation law provides little guidance on transfers. Moreover, neither the Department of the Interior nor the Bureau has indicated how it would apply reclamation law or specified other requirements for approving transfers. Potential transferrers of Bureau-provided water may be discouraged if they are uncertain about the legality of transfers and cannot form secure expectations about the outcome of the transfer approval process. While these limitations and uncertainties were largely removed for the CVP under the Central Valley Project Improvement Act, they remain for other reclamation projects. Physical constraints can also impede transfers of Bureau-provided water.

We reviewed the general aspects of reclamation law that potentially affect all reclamation projects and can impede transfers. The actual impediments in each of the Bureau's projects will vary, depending upon factors such as project-authorizing legislation, specific contract provisions, and project operational concerns and obligations. Additional laws affect the distribution of Colorado River water, and the water allocations specified under Colorado River compacts may create additional limitations on or uncertainty about transfers of this water. We did not analyze the laws and compacts affecting the management of Colorado River water, the compacts affecting management of other rivers, or other issues related to interstate transfers.

Legal Limitations and Uncertainties Can Impede Transfers

Legislation authorizing specific purposes and service areas for projects can prohibit transfers to purposes not authorized by the legislation or prohibit transfers outside of the projects' service areas. Furthermore, the significance of other provisions in reclamation law on transfers is unclear, and Interior and the Bureau have not indicated how they would apply reclamation law to transfers.

Authorizing Legislation Can Restrict Transfers

The legislation authorizing a Bureau project specifies the purposes for which the project's water may be used—such as irrigation, M&I, hydroelectric power, recreation, and fish and wildlife—and generally identifies the project's service areas. Some projects are authorized only for irrigation. Transferring water for unauthorized purposes or outside of the areas in which the Congress authorized the project's water to be used

could be prohibited, depending upon whether other reclamation laws can be used to provide the authority for the transfers.

Three laws—the Reclamation Project Act of 1939 (43 U.S.C. 485h), a 1906 act (43 U.S.C. 567), and a 1920 act (43 U.S.C. 521)—authorize the Secretary of the Interior to contract for water from irrigation projects for purposes other than irrigation, if certain conditions are met. Under the Reclamation Project Act, contracts for new uses must not impair the efficiency of the project for irrigation,[1] and the 1906 act applies only to nearby towns developed in connection with reclamation projects. Under the 1920 act, contracts for new uses must not be detrimental to the water service for the irrigation project. In addition, under the 1920 act, there must be no other practicable source of water supply, and the existing water users in the project must grant their permission for new uses. The Water Supply Act of 1958, as amended, and the Federal Water Project Recreation Act, as amended, can also add project purposes, but they can do so only in limited circumstances. (These laws are discussed in ch. 6.)

According to case studies by the Natural Resources Law Center at the University of Colorado,[2] the Bureau has relied on some of these reclamation laws and authorities to allow transfers to originally unauthorized project purposes or service areas. For example, the Bureau indicated that the Reclamation Project Act of 1939 provided the authority to transfer water from the Bureau's Kendrick Project in Wyoming to the City of Casper. The transfer occurred outside of the project's service area and was for M&I use not originally authorized for the project. Similarly, transfers to M&I use from the Rio Grande Project in New Mexico were allowed under the 1920 act, even though the project was authorized only for irrigation.

In 1988, Interior issued its principles governing voluntary water transactions to facilitate water transfers that involve or affect facilities owned or operated by Interior, if the transfers satisfy seven principles. (The principles are summarized in table 5.1.) Subsequently, the Bureau of Reclamation issued its criteria and guidance to assist its regional directors in implementing Interior's principles. However, neither the principles nor the criteria and guidance outline the conditions under which proposed

[1]This provision does not apply to M&I water supply for projects constructed under the Colorado River Storage Project Act (43 U.S.C. 620, 620c).

[2]Lawrence J. MacDonnell, Richard W. Wahl, and Bruce C. Driver, Facilitating Voluntary Transfers of Bureau of Reclamation-Supplied Water, Vol. I, Natural Resources Law Center, University of Colorado School of Law, Dec. 1991.

transfers that involve a use not authorized as a project purpose, or a place of use outside of the authorized service area, will be approved under reclamation laws such as the Reclamation Project Act of 1939, the 1906 act, or the 1920 act. Rather, the criteria and guidance indicate that such transfers may require authorizing legislation to allow such use and that the primary responsibility for such legislation will rest with the entities proposing the transaction. Therefore, parties interested in the transfer must obtain legal authority through the Congress to transfer the water to its new use or location. Such an effort is likely to add substantially to transaction costs and have a highly uncertain outcome. Furthermore, in some cases the boundaries of the project's service areas may not be apparent; many project authorizations do not clearly outline project service areas.

Table 5.1: Summary of Interior's Principles Governing Voluntary Water Transactions

Principle 1: Water transfers must be in accordance with applicable state and federal laws.
Principle 2: Interior will become involved only in water transfers that can be accomplished without diminution in service to others served, and that, among other things, potentially affect federal projects or federally owned water rights, or when appropriate nonfederal authorities request Interior involvement.
Principle 3: Interior's approval is contingent on mitigating or avoiding adverse third-party effects.
Principle 4: Interior will not suggest specific transactions unless such transactions would be involved in an Indian water rights settlement; would be involved in a solution of other water rights controversies; or could provide a dependable water supply that otherwise would involve the expenditure of federal funds.
Principle 5: The fact that the transaction may involve the use of water supplies developed by federal water projects shall not be considered during an evaluation of proposed transfers.
Principle 6: Interior will not burden a proposed transfer with extra costs, unless required explicitly by existing law, contracts, or regulations, but will ensure that the government is financially, operationally, and contractually in an acceptable position once a transfer is made.
Principle 7: Interior will consider necessary measures to mitigate any adverse environmental impacts that may be created by a proposed transfer.

As municipal, industrial, and environmental demand for water increases, many desirable transfers are likely to be transfers from irrigation to other uses outside of irrigation projects' service areas. However, it is unclear under what conditions these transfers may be permitted.

Contract Provisions Can Limit Transfers

The Bureau has entered into long-term repayment and water service contracts with irrigation districts to deliver reclamation water and recover

a portion of the projects' construction costs. According to a 1989 survey of the Bureau's contracts,[3] the contracts' provisions contain a variety of impediments to transfers. For example, some contracts prohibit water transfers or resales; others limit the uses of contract water, such as to agricultural uses or uses on particular lands (such as within the contracting district). Some contracts have explicit conditions that any increased income from water resales by a contractor must be paid to the United States to further reduce the district's repayment obligation. Such provisions are disincentives to users of Bureau water to propose transfers.

The Reclamation Reform Act Can Discourage Transfers

The Reclamation Reform Act of 1982 (43 U.S.C. 390cc) could discourage some contractors from participating in water transfers because it requires higher rates for irrigation when contracts are amended. The act requires that water rates in certain new or amended contracts be increased sufficiently to cover the project's full operation and maintenance costs. The fixed rates established in some contracts have not always been sufficient to allow the recovery of operation and maintenance costs over the life of the contract. Under the act, those amended contracts that enable the contractor to receive supplemental or additional benefits must pay the operation and maintenance rate, which may be higher than the contractor's current rate. Many transfers require contract amendments to overcome the restrictions in the existing contracts and to shift water deliveries from the sellers to the buyers. Some of these transfers may be viewed as providing supplemental and additional benefits to federal contractors, which could require higher payments to the federal government.[4]

The Bureau's criteria and guidance indicate that if an existing contract must be changed to allow a proposed transfer, the Reclamation Reform Act's provisions must be considered. But the criteria and guidance do not outline the criteria used to determine whether the act's provisions will apply and when increased repayment will be required as a result of a transfer. The guidance refers to a solicitor's memorandum and agency regulations for these criteria. The memorandum and regulations indicate under what conditions contract amendments are not construed as providing supplemental and additional benefits and therefore may not trigger the increased rate provisions of the Reclamation Reform Act.

[3]Richard W. Wahl, Markets for Federal Water: Subsidies, Property Rights, and the Bureau of Reclamation, Resources for the Future (Washington, D.C.: 1989) pp. 156-172.

[4]Under the Central Valley Project Improvement Act, contracts established to transfer water are not considered to add supplemental and additional benefits and therefore do not trigger Reclamation Reform Act provisions.

However, these criteria are not provided in Interior's principles or the Bureau's criteria and guidance.

In addition, it remains unclear whether all contract amendments not meeting the criteria would be considered supplemental and additional benefits that trigger rate increases under the reform act. Moreover, the transfer guidance does not address what types of transfers would actually require contract amendments or in what way contracts would need to be amended.

The Reclamation Reform Act also increased to 960 the number of owned or leased acres that a single entity can irrigate with subsidized water. Those agricultural users not previously subject to reclamation law are subject to the acreage limitations under the Reclamation Reform Act, if they purchase subsidized, Bureau-provided water, or they must pay the full cost[5] for this water. These water users may not purchase agricultural water from federal contractors if they become subject to acreage restrictions or if they have to pay a substantially higher rate for the water.

Definition and Application of Appurtenancy Requirement Is Unclear

Section 8 of the Reclamation Act of 1902 requires that the right to use federally supplied water be appurtenant to the land irrigated but does not define what is meant by "appurtenant." This provision could be interpreted as requiring that water be attached to the land irrigated. If interpreted this way, this provision could severely impede water transfers, because it could restrict water to the lands currently receiving deliveries of project water for irrigation use. Subsequent legislation allowing water to be used for nonirrigation purposes, such as the Reclamation Project Act of 1939, and the Bureau's approval of past transfers suggest that this provision may not apply. However, neither Interior's principles nor the Bureau's criteria and guidance contain any discussion of the appurtenancy requirement or the agencies' interpretation and application of this requirement.

[5]The full-cost rate as defined in the Reclamation Reform Act is an annual rate intended to repay the federal government's outstanding expenditures for project construction allocated to irrigation, plus operation and maintenance deficits, with interest, from the date of the act's enactment. The subsidized rate is based on repayment of the federal government's investment in the irrigation component of the project, without interest.

Other Approval Requirements Are Not Specified in the Agencies' Guidance

Interior's principles and the Bureau's criteria and guidance outline requirements in addition to reclamation law that must be met for transfer approval. While they provide agency officials with general guidelines to follow in approving proposed transfers, they do not specify the criteria that transfers must satisfy to be approved.[6]

Federal Third-Party Concerns Not Defined

Principle 3 indicates that Interior will participate in or approve transactions when either (1) there are no adverse third-party consequences, (2) such third-party consequences will be adjudicated in appropriate state forums, or (3) the impacts on third-parties are mitigated to the satisfaction of the affected parties. The criteria and guidance indicate that concerns for the effects on third-parties must be addressed from both the state and federal perspective. But it is unclear, on the basis of the Bureau's criteria for third-party impacts, how concerns would have to be addressed from the federal perspective, because these concerns are not identified.

Maintaining project operations for other users and authorized purposes clearly is a federal concern, but the criteria and guidance explicitly address this requirement under Principle 2, not Principle 3. Rather, in clarifying Principle 3, the criteria and guidance identify third parties as entities who would have legal standing in a state adjudication process. The Bureau's guidance leaves identification of these entities, the validity of their concerns, and the satisfaction of their concerns with the state. This appears to leave all concerns to resolution by the state. The principles allude to additional federal concerns, but it remains unclear what potential federal concerns will have to be addressed by transfer applicants. Transfer applicants therefore cannot anticipate what requirements they will have to satisfy and cannot form secure expectations about the outcome or costs of transfer approval.

Rates to Be Charged for Transferred Water Are Unspecified

In connection with water users' repayment obligations, Principle 6 indicates that Interior will ensure that the federal government is in an acceptable financial, operational, and contractual position after a transfer.

[6]The Bureau is establishing guidelines for the Mid-Pacific Region's implementation of water transfers under the Central Valley Project Improvement Act. Our discussion of Interior's and the Bureau's guidance does not include the consideration of additional guidance specific to the CVP that is being developed in response to the act. In addition, the Bureau's Lower Colorado Regional Office has drafted regulations to be published as a proposed rule in the Federal Register to administer entitlements of Colorado River water in the Lower Colorado River Basin. According to Bureau officials in the Lower Colorado Region, these regulations provide specific guidelines and criteria that recognize different types of water transactions.

However, the criteria and guidance do not specify how the repayment rates should be calculated. For example, the criteria and guidance indicate that a change in use from irrigation to M&I purposes would require a change in the repayment of costs to include interest during construction and interest on capital costs owed for the years remaining in the payment period. The guidance also indicates that any power revenue assistance to cover costs beyond the irrigators' ability to pay should be reduced from the amount owed by power users.[7] In other words, the irrigation subsidies cannot be passed on to M&I users.

However, under reclamation law, the Secretary of the Interior has discretion over what interest rate can be charged for M&I uses, unless the rate is specified in a project's authorizing legislation. In addition, the Bureau has used two different ways of calculating the reduction in power revenue assistance from the amount owed by power users. The guidance does not identify what interest rate should be used and does not indicate how power revenue assistance should be reduced.

Both the interest rates and the calculations of power revenue assistance can affect the rates charged for water that is transferred to M&I uses. They also can affect the overall repayment obligations for transferred water and have a direct impact on the profitability of a transfer. As the rate charged for transferred water increases, the profit realized by the seller decreases because a larger portion of the selling price is owed to the federal government. To form expectations about the profitability of a transfer, potential transferrers need to know what rates will be charged by the Bureau. We currently are examining problems with the Bureau's rate-setting guidance and ways to increase federal revenues from water transfers and are presenting our findings in another report.

Environmental Requirements Are Not Specified

Federal environmental requirements are not specified in the principles or the criteria and guidance. Principle 7 indicates that Interior will consider necessary measures that may be required to mitigate any adverse environmental effects that may arise as a result of the proposed transaction. The criteria and guidance indicate that this will be accomplished through compliance with NEPA. Documentation for compliance with NEPA could range from a categorical exclusion to an

[7]Irrigation rates are considered subsidized because they do not cover the interest on the federal government's investment in the irrigation component of its water resources projects. In addition, the irrigation construction costs to be repaid by the irrigators may be reduced on the basis of a determination of the irrigators' ability to pay. The amount by which the irrigation construction costs are reduced is paid by the power users without interest, usually at the end of the project's repayment period. This amount is referred to as power revenue assistance.

environmental impact statement. The type of documentation required will be a function of the specific action being proposed. Any federal NEPA compliance costs associated with a transfer are to be repaid by the entities involved.

The Bureau provides no additional information in its guidance on this potentially time-consuming and expensive requirement. For example, it provides no information on the processes or procedures for determining whether a transfer is categorically excluded from further NEPA requirements or for what types of transfers a potentially lengthy and costly environmental impact statement might be necessary.

Interior Plays a Passive Role in Water Transfers

Interior and Bureau officials involved in developing the principles and criteria and guidance indicated that Interior plays a passive role in transfers and will act as a facilitator of transfers if other parties propose them. According to the Bureau official who was the primary author of the criteria and guidance, the Bureau has not addressed the legal uncertainties about reclamation law and transfers because the Bureau is not soliciting or promoting transfers. Once parties are interested in a transfer, they must approach the Bureau with their proposal, and the Bureau will then discuss with them the legal and other issues that must be addressed.

According to some water professionals involved in water transfers, Bureau personnel have been an impediment to transfers of water from the Bureau's projects in the past. They have not provided clear direction on water transfers and have been negative toward transfers. Some indicated that Bureau staff have felt constrained by limitations in reclamation law.

Recent Legislation Has Removed Legal Impediments, in Some Circumstances

Many of the impediments to transfers in reclamation law have been removed by legislation, in some cases. The Central Valley Project Improvement Act, passed in 1992, removes many of the impediments in reclamation law for water in the Bureau's CVP in California. The act's provisions allow any individual or water district to transfer CVP water to any other California water user or agency for any purpose recognized as beneficial in the state of California. Such transfers are deemed a beneficial use of water; therefore, applicants do not risk losing their rights under the "use it or lose it" philosophy if they propose transfers. Transfers are not considered to confer supplemental or additional benefits on CVP contractors and therefore do not trigger the Reclamation Reform Act's pricing requirements on irrigators. These provisions override concerns

about a project's purpose and service area, uncertainty about impacts on irrigation efficiency, and fears that contract amendment will trigger the Reclamation Reform Act. They also allow individual water users to realize the benefits of water transfers directly, providing direct incentives to transfer water.

Similarly, the Reclamation States Emergency Drought Relief Act of 1991 allows the Bureau to store and convey both project and nonproject water for use within and outside of a project's authorized service area via temporary contracts during drought. It also removes concerns about the Reclamation Reform Act's requirements by clearly stating that such temporary contracts, or amendments to existing contracts to provide water, will not be subject to reform act pricing and acreage limitations. These provisions allow federal project contractors to sell their water to buyers outside of the projects' service areas without concerns about the reform act's provisions. However, this assistance is available only if requested by the governor of an affected state or by the governing body of an affected tribe, during drought.

Physical Constraints Can Impede Water Transfers

Constraints on physically moving the water transferred from one location to another can be an impediment to water transfers. The Bureau controls major conveyance facilities in some states. The excess capacity of these facilities could be used to convey both project and nonproject water, thereby reducing impediments to certain transfers. The Warren Act (43 U.S.C. 523) authorizes the Secretary to contract for the use of excess storage or carrying capacity in reclamation projects to permit nonfederal irrigation water to be delivered, even outside of the federal project's service area. According to the Bureau's criteria and guidance, the storage or transfer of nonfederally supplied water for M&I purposes also can be accomplished generally for all projects under the authority of the Reclamation Project Act of 1939, which allows Interior to enter into contracts to furnish water for municipal supply or miscellaneous purposes. However, it is unclear whether the Reclamation Project Act allows the conveyance of nonfederally supplied water for M&I purposes. This issue currently is being considered within the Bureau of Reclamation.

Physical constraints do exist. For example, in California the physical constraint to moving water occurs at the Sacramento-San Joaquin River Delta. The federal government currently does not have the capacity at its facilities to move additional water from north of the delta to south of the delta. The capacity is fully used in normal years, and pumping water south

of the delta is now restricted in compliance with the Endangered Species Act. The U.S. Fish and Wildlife Service maintains that transfers across the delta are harmful to fish such as American shad, striped bass, and salmon. Water pumped south from the delta disrupts the normal water circulation pattern and disorients migrating fish. According to Fish and Wildlife Service officials, the existing water quality standards and flow conditions in the delta are not adequate to maintain migrating fish, and current populations are at extremely low levels. Increased delta pumping will result in greater losses of fish.

A Coordinated Operating Agreement between the federal government and the state of California was signed to coordinate the operation of the federal Central Valley Project and California's State Water Project. Under part of the agreement, CVP water could be conveyed south of the delta through the state aqueduct, reducing the limitations in federal capacity, and the state would get water from the CVP in return. This part of the agreement has not gone forward because of uncertainties about environmental standards.

Conclusion

Interior and the Bureau have indicated their willingness to facilitate voluntary transactions that satisfy certain principles. Because each transfer is unique, transfer approval must occur on a case-by-case basis, and the Bureau cannot anticipate the specific criteria necessary to meet all potential transfer situations. However, we believe that, to reduce uncertainty, the Bureau can further specify the existing criteria. The uncertainty about transfer approval criteria prevents buyers and sellers from forming expectations about the feasibility, cost, and timing of proposed transfers. This uncertainty can discourage, rather than facilitate, transfers.

Recommendation to the Secretary of the Interior

To reduce the uncertainty and confusion associated with transfers, we recommend that the Secretary of the Interior expand and clarify the agency's transfer guidance to specify the requirements that must be met in approving transfers. Specifically, the Secretary should (1) list and explain any federal reclamation laws that must be satisfied, including under what conditions contract amendments would trigger Reclamation Reform Act provisions; (2) clarify the procedures and approval requirements for transfers, including when contracts would have to be amended, how the rates charged for transferred water will be determined, and what third-party concerns must be addressed from the federal perspective; and

(3) develop clear NEPA compliance requirements that are specific to water transfers.

Agency Comments

Interior generally concurred with our recommendations to the Secretary. Interior indicated that the Bureau of Reclamation is developing and intends to propose legislation that will address federal impediments to water transfers and will indicate the NEPA compliance requirements for transfer approval. In addition, Interior indicated that efforts currently are under way to specify requirements for water transfers in the CVP and the Lower Colorado River Basin.

However, Interior's and the Bureau's requirements for transfer approval under existing law remain unclear, and Interior has not indicated how it will specify requirements for water transfers in projects other than the CVP and the Lower Colorado River Basin. We believe that more immediate action is needed to minimize the uncertainty that will continue to occur before new legislation is completed. We also believe that requirements need to be clarified for all projects. Interior's comments and our responses are presented fully in appendix III.

Issues to Address in Implementing Water Markets: Federal Laws and Policies Affecting the Corps of Engineers

Restrictions on authorized project purposes and the lack of a specific policy and guidance on transfers can impede transfers of water from the facilities operated by the Corps of Engineers. While the Corps has expressed support for facilitating transfers, it does not have a specific policy or guidance governing transfer approval. Clear guidance addressing the requirements for transfer approval could reduce the uncertainty associated with transfers and encourage more transfers.

Legal Restrictions on Project Purposes May Restrict Transfers

Water use from the Corps' projects is legally restricted by each project's authorized purposes; for a transfer to occur, the new use of transferred water must be an authorized project purpose. However, according to the Corps, many of its projects are not authorized for all purposes, and adding authorized purposes would often require an act of Congress, which can be time-consuming and expensive.

For example, the Corps' Sacramento District in California administers 16 projects. However, only four projects have M&I as an authorized project purpose. Two of the four projects that have M&I as an authorized purpose also have irrigation as an authorized purpose.[1] Currently, therefore, only those two projects have the legal authorization necessary to allow water to be transferred from an agricultural user to an M&I user. In the remaining 14 projects, 7 have irrigation as an authorized purpose but do not have M&I as an authorized purpose, and agricultural water could not be transferred to these uses without additional authorization. The others are managed primarily for flood control.[2]

Project purposes can be added to the Corps' projects through congressional authorization or, if certain conditions are met, under general legislation affecting all of the Corps' projects. The Water Supply Act of 1958, as amended (43 U.S.C. 390d), and the Federal Water Project Recreation Act of 1965, as amended (16 U.S.C. 460l-13), authorize the Corps to add M&I and recreation uses, respectively, at an existing project without specific congressional authorization, under certain conditions.

Under the Water Supply Act of 1958, the Corps can add M&I storage space as a purpose to an existing project, if it is modified to include new M&I

[1]According to the Corps, only the New Hogan, Coyote Valley Dam, Warm Springs Dam, and Martis Creek projects have M&I water supply as an authorized purpose. The Coyote Valley Dam and New Hogan projects also have irrigation as an authorized purpose.

[2]These are the authorized purposes as reported by the Corps in Authorized and Operating Purposes of Corps of Engineers Reservoirs (July 1992).

storage space. The Corps believes the 1958 Water Supply Act allows the Corps to add M&I water storage space to existing projects with any operational or structural change. In the past, the Corps has reallocated some storage space to M&I purposes with only operational changes. The Corps currently administers its projects under this interpretation of the Water Supply Act. For example, the Corps believes it can reallocate storage in all of the Sacramento District projects, whether M&I supply is currently authorized or not, if the impacts of such reallocation on project purposes are not serious.

However, as we reported in August 1991,[3] the Water Supply Act authorizes the Corps to add M&I as a purpose only if the project has been structurally modified through the construction or expansion of reservoirs, not simply if operational changes occur. In our opinion, therefore, congressional authorization is necessary to add M&I as an authorized project purpose without structural modification. Obtaining authorization through congressional action and making structural changes to projects can be time-consuming and expensive processes for transfer applicants to carry out. Such requirements to transfer water to M&I use may discourage transfers.

The Federal Water Project Recreation Act of 1965, as amended, allows the Secretary to add recreation and fish and wildlife enhancements to existing projects, if a nonfederal party agrees to share the associated costs. However, the act does not add recreation or fish and wildlife as a generally authorized purpose of the project.

In addition, under section 6 of the Flood Control Act of 1944, as amended (33 U.S.C. 708), if M&I water supply is not an authorized project purpose, the Corps may provide surplus water for M&I purposes. However, if this surplus water is needed at a later time for authorized purposes, it is no longer available for M&I water supply purposes. This surplus water supply may be useful for short-term transfers of water, but it does not provide a secure source of water.

Other legal restrictions may be imposed by river compacts. We did not examine these restrictions or other issues related to interstate transfers of water.

[3]Water Resources: Corps Lacks Authority for Water Supply Contracts (GAO/RCED-91-151, Aug. 20, 1991).

Corps Has Not Developed Specific Transfer Policy and Guidance

According to Corps officials at Corps headquarters in Washington, D.C., because the concept of transfers is new to the Corps, it has not yet developed specific policies and guidance to govern the approval of water transfers. Rather, transfer approval is based on the Corps' existing policies and guidance governing changes in water use that are included in various policy documents and regulations. Water use changes at the Corps' projects often involve reallocations, in which the Corps changes the designated use for a portion of storage space in the reservoir from one purpose to another. In contrast, with water transfers, existing users of the Corps' projects could choose to sell their water to other users. A transfer may or may not require reallocation by the Corps, depending on the extent to which it would require a change in the project's operations. We performed an extensive review of the Corps' water use policies and held numerous discussions with agency officials to identify which policies might apply to water transfers.

The Corps' policies indicate that changes in water use, including transfers, must satisfy operational, environmental, and contractual requirements necessary to protect other project purposes and the environment. While these restrictions serve important purposes, the lack of specific guidance for satisfying all of these requirements as they relate to transfers can add to the time, cost, and uncertainty associated with transfers.

Operational Requirements

The policies governing changes in water use in the Corps' projects indicate that the impacts of transfers on the projects' operations must be reviewed and many requirements must be satisfied before the transfers can proceed. Those transfers that would seriously affect other project purposes could not be allowed by the Corps without congressional authorization. For example, many of the Corps' projects were built for flood control purposes. Corps officials indicated that a change in a project's operations that would alter the project's flood control parameters and affect the safety of local communities very likely would not be allowed, depending on the circumstances.

Transfers that will not adversely affect other purposes but will require a change in the operation of reservoirs must be reviewed to determine the necessary changes. Changes in the water control plan are necessary if a modification to the body of water stored in a project, such as a change in water flow, is necessary. Water control plans outline the storage and release of water from the reservoir under all conditions, ranging from flood to drought. In addition, under the Water Resources Development Act

of 1990 (P.L. 101-640), public notification is required when a water control plan is being considered for change. Because a transfer of water from seasonal agricultural use to year-round M&I use would most likely require a change to the water control plan, the public would review the new plan resulting from such proposed transfers.

Any transfers that affect a project's operations would be considered reallocations and would require reallocation studies, according to Corps officials. Reallocations are changes in the designated use for a particular portion of storage space in the reservoir from one purpose to another; such reallocations allow the Corps to enter into permanent water storage contracts with new users. Conversely, any transfer that did not affect a project's operations would not require a reallocation of water storage space or a new contract with the Corps. These types of transfers allow the seller to subcontract water directly to the buyer without requiring a new contract with the Corps.

Environmental Requirements

Federal environmental laws must be satisfied before transfers can proceed. For example, the Fishery Conservation and Management Act of 1976, as amended, requires the Corps to respond to comments or recommendations made by the Regional Fishery Management Council[4] when any federal activity or action, such as a change in a water control plan, affects a fishery.

Changes in water use, such as transfers, must also satisfy NEPA requirements. The Corps' policy for NEPA implementation requires the Corps to assess the consequences that any changes in a project's operations, such as water transfers, would have on the environment. An environmental assessment is required when the project's water release pattern is changed. If an assessment is not sufficient to determine the impacts that an operational change would have on the environment, an environmental impact statement would be required. According to Corps officials, the Corps and the parties to a proposed transfer are responsible for conducting the impact statements.

Certain Corps activities and actions are categorically excluded from the requirement to conduct either an environmental assessment or an

[4]Under the Magnuson Fishery Conservation and Management Act of 1976 (P.L. 94-265), as amended in 1986 (16 U.S.C. 1801, 1852), regional Fishery Management Councils were established for eight regions to develop management plans for the fisheries within their regions. Each Council may comment on or make recommendations on any activity undertaken, or proposed to be undertaken, by any state or federal agency that may affect the habitat of a fishery resource under its jurisdiction.

environmental impact statement. According to the Corps, a transfer that did not require a change in project operations may be excluded. However, on the basis of our review of the Corps' NEPA guidance and discussions with Corps officials, it is apparent that a transfer would not be categorically excluded from environmental requirements if it required any change to a project's operations.

Contractual Requirements

In the 17 western states, the Bureau of Reclamation generally administers contracts for irrigation water drawn from the Corps' projects. Some of the Bureau's repayment contracts for irrigation water stored in the Corps' projects do not allow for water transfers to other purposes; stored water can be used for irrigation purposes only. Furthermore, some contracts restrict the ability of an irrigator to subcontract or transfer water to any party outside of the irrigator's service district. The contracts would have to be amended to allow water to be transferred to an M&I user, according to Bureau officials. Corps officials indicated that the Corps would become involved if a transfer altered a project's operations. In such cases, they would have to address operational and environmental requirements.

Similarly, the Corps' water storage contracts[5] for M&I water storage state that water storage space will be used for M&I water. However, the contracts do not prevent water users from selling their water to other users, once it has been discharged from a Corps project. Corps officials have stated that they are concerned about the impact a transfer would have on a project's operations, not about what happens to the water once it is evacuated from a project. Therefore, it appears that M&I water users can transfer their water to others, after it is released from the reservoir, without the Corps' approval.[6]

Rates Charged

Rates to be charged for transferred water must also be determined and can affect the profitability of transfers. When project purposes are added or water is reallocated to a different purpose, such as through water transfers, the Corps must calculate an appropriate rate to charge the project's users. The Corps' policy outlines two different procedures for determining the new rates, depending on whether the reservoir modification involves adding storage or reallocating storage. These procedures allow the Corps some discretion in establishing rates. If a

[5]The contract is a standard document used for contracting M&I water storage space.

[6]If the water transferred involved a change in the water right, the transfer still would have to be approved by the state.

transfer does not require a contract with the Corps, the Corps will not establish new rates.

The Corps' Future Transfer Policy

During our discussions with Corps officials, they voiced their interest in and willingness to facilitate beneficial water transfers where they are desired by state and local interests. Officials stated that the Corps wants to encourage the highest-valued use of water resources and will do everything in its power to reduce any needless impediments that could discourage desirable transfers. However, the Corps currently does not have plans to develop a transfer policy outside of its policies on water reallocation and project modification. Corps officials indicated that, because the Bureau is the major federal water supply agency for irrigation water, it would be premature for the Corps to develop a policy before the Bureau did.

Transfers of water in the Corps' projects from agricultural use to M&I use may not be a primary concern of the Corps. The Corps' data on project purposes indicate that only 28 percent of the Corps' projects in the 17 western states contain storage space for irrigation water, and most of that water is administered by the Bureau of Reclamation. However, the Corps has received requests for reallocations of reservoir storage space in recent years, not only from irrigation uses, but also from flood control to other purposes, such as fish and wildlife and M&I. In anticipation of future requests for reallocations to M&I storage space, Corps district offices in the Pacific Northwest have been encouraged by Corps headquarters to perform reallocation studies on sufficient amounts of storage to meet anticipated new demand, rather than to perform studies on each and every request. This would reduce time delays and uncertainty when the reallocations are requested. The Corps also recently held a workshop[7] to familiarize its staff with the procedures to follow for reallocating water supply. The workshop reviewed the steps necessary to approve specific reallocations that have already been proposed.

Conclusion

The current requirements for transfer approval remain embedded in existing policies and guidance governing water use that do not specifically address water transfers. While each transfer is unique and actual approval requirements may vary case by case, clear information outlining requirements that is easily available to potential buyers and sellers in a

[7]The workshop was given by a Corps official from Walla Walla headquarters to several employees of the Portland District Office and others to familiarize them with the policies on reallocations.

single document could facilitate transfers. Such guidance could allow transfer applicants to more easily understand the requirements that must be satisfied; arrive at reasonable expectations about the outcome, cost, and timing of a proposed transfer; and focus their resources on meeting specific requirements.

Recommendation to the Secretary of the Army

To reduce the uncertainty and confusion associated with transfers, we recommend that the Secretary require the Corps of Engineers to (1) identify the existing procedures and requirements that must be satisfied for water to be transferred and (2) establish guidelines for the approval of water transfers. The guidelines should outline the steps required to satisfy operational, environmental, and contractual requirements and how rates for transferred water will be determined.

Agency Comments

The Department of Defense (DOD) generally concurred with our findings and recommendations. However, DOD stated that because the Bureau of Reclamation is the predominant agency with jurisdiction over the sale of federally provided irrigation water in the West, Interior has first and primary responsibility for developing policies affecting water transfers. DOD indicated that the Secretary of the Army will request the Corps to consult with the Bureau and develop water transfer policies after the Bureau's policy is developed.

We agree that the Corps should consult with the Bureau during the development of water transfer policies. However, the Corps has obligations involving the operation of its reservoirs that must be considered in approving transfers. While many transfer approval requirements may involve the Bureau as the agency administering irrigation contracts, requirements for reservoir operations are likely to require consideration predominantly by the Corps. In addition, not all transfers of water will involve irrigation water. Clear requirements for transferring water stored in the Corps' reservoirs that do not involve Bureau contracts can be developed without the presence of a Bureau policy. Accordingly, we continue to believe that the Secretary of the Army should require the Corps to establish guidelines for the approval of water transfers. DOD's comments and our responses are presented fully in appendix IV.

Conclusions and Matters for Congressional Consideration

Water markets are a valuable tool for reallocating scarce water supplies to new uses, increasing economic efficiency, and improving environmental quality. They provide a way to meet many new water demands without constructing new water projects—an important goal in view of the budget constraints at all government levels and the growing concerns about the environmental impacts of dams. But changes in water use in the arid West can have both positive and negative impacts on the associated communities and the environment. The Congress has recognized the value of water markets for increasing water use and economic efficiency through the Drought Act and the Central Valley Project Improvement Act. Whether more widespread transfers of federal project water should be encouraged—considering both the positive and negative impacts of transfers—and how best to address the adverse impacts that can accompany such transfers are policy decisions for the Congress.

Water Markets Have Beneficial and Adverse Impacts

Water markets provide a mechanism for dealing with the growing national problems of inadequate supplies and environmental degradation caused by current water use. Markets help satisfy new water demands in an economically efficient manner by reallocating water through voluntary transfers. They provide financial incentives for reallocation—buyers will enter into transactions only if they provide a less expensive water supply than other sources, and sellers will enter into transactions only if they provide more income than current water uses. Voluntary trading increases economic efficiency by delivering water to those who put the highest economic value on it.

Water markets can also encourage water conservation. As water becomes more valuable and prices rise, markets send signals to water users to conserve water. Users who can reduce their consumption do so and sell their water to those who want more water. Markets can encourage irrigators to conserve water and voluntarily sell their conserved water to urban areas that are willing to pay high prices for the water. Irrigators could be made better off financially, while cities could enjoy water at lower prices than they could obtain by building new facilities. When less land is irrigated, agricultural drainage and runoff decrease. The environment benefits further if water currently dedicated to irrigation can be sold to maintain fish and wildlife habitats that have inadequate supplies.

Yet not all of the impacts of transfers are positive. Significant economic and other losses can be experienced at the local level. Concern about

these impacts can create opposition and impede transfers. For example, if agricultural land is taken out of production to transfer water to an urban area, the economic impacts could include reductions in farm income, the dislocation of farm workers, reduced tax revenues, and the decline of government services. The farms that remain may be insufficient to support the local suppliers and processors of agricultural products, and these businesses may fail. Communities can also experience social impacts, including changes in the way of life and local traditions, changes in community structure and cohesion, and loss of control over natural resources and the future of the community.

Transfers can alter instream flow levels, which affect water quality, fish and wildlife populations, and recreation. Groundwater overdraft problems could occur, such as land subsidence or increased pumping costs, when water must be pumped from deeper levels. Depleted aquifers also can lower water table levels at the surface, drying up wetlands and affecting other wildlife habitat. Undesirable soil conditions can develop if agricultural water is sold and farmland is retired.

Existing Laws and Procedures May Not Adequately Address Adverse Third-Party Impacts

Currently, these impacts may not be adequately considered before transfers occur—the states' review of community and environmental impacts vary, and the existing federal environmental laws may not address all of the environmental impacts of transfers. In some states, the effects that water transfers may have on such factors as local economies, fish, wildlife, and recreation can be considered when a transfer proposal is evaluated. In other states, many potential environmental or local community concerns are not addressed. The existing federal environmental laws were not specifically designed or coordinated to address the range of potential adverse impacts associated with water transfers.

How best to address the impacts of water transfers on third parties, without overly burdening transfers with additional impediments, is a complex and site-specific process. It requires the consideration of local economic, social, and environmental conditions and the recognition of existing strategies and their effectiveness. Our analysis of 14 strategies indicated that a combination of strategies will be needed to address the wide range of third-party impacts and to accommodate the characteristics of different types of transfers.

Obstacles to Implementation Remain

Some transfers in the western states have involved water provided from federal facilities, despite obstacles in federal and state laws and policies. Yet additional transfers and improved efficiency of water use are likely to occur if these obstacles are removed. At the federal level, the project authorization laws that restrict the uses and services areas of federally provided water and the water management laws that limit transfers to other users, could be amended. While each transfer is unique and transfers will need to be evaluated on a case-by-case basis, the Bureau's and the Corps' transfer requirements can be clarified further, reducing the uncertainty that can discourage transfers.

Other obstacles remain at the state level, however, including state laws on beneficial uses and instream water rights that discourage or prohibit some transfers of water. Moreover, markets require clear, secure property rights to function, yet unquantified Indian reserve rights make ownership of water rights uncertain. Complex relationships between the Bureau, state-established districts, and water users can add to confusion about the rights to transfer water. Resolving issues that involve state laws and Indian tribes is less straightforward than removing federal impediments. State laws currently govern many aspects of water use, and western states want to retain this primacy with little involvement from the federal government. Efforts to remove impediments in state laws on water rights or to address some third-party impacts could be viewed as federal interference and be strongly resisted. Indian water rights issues raise additional complex questions about state and federal water laws and tribal sovereignty.

Options for the Federal Role

Because of state primacy, the fundamental issue facing the Congress in developing a federal water transfer policy is the appropriate roles of the federal and state governments in removing impediments to transfers at the state level and in addressing third-party impacts. On the basis of our discussions with water market professionals and our review of the literature, we believe that the federal government can take three general approaches to its role in removing the impediments to transfers at the state level and addressing third-party impacts. It could continue to rely heavily on the states' procedures for addressing third-party impacts and on state laws determining beneficial use; it could add its own approval requirements to address third-party impacts and override the states' beneficial-use laws for water provided from federal facilities; or it could encourage the states to make changes in their laws to meet desired goals. Choosing the appropriate role for the federal and state governments is a policy decision for the Congress.

Rely on States' Procedures

Water use decisions, in general, traditionally have been the responsibility of the states, and the Congress has explicitly recognized the states' primacy in previous water laws. The Congress could continue to leave beneficial-use determinations and many of the potential adverse consequences of transfers of federal project water in the states' hands. This approach has some advantages. Because the states have the proximity to and first-hand knowledge of water problems, they may better understand their specific water needs and concerns and the most effective ways to achieve their goals. This approach also would likely be welcomed by the western states, as indicated in reports by the Western Governors' Association and the Western States Water Council.

The disadvantages are that some efficiency gains from transfers of project water may not be realized and that project water may be transferred with potentially significant adverse consequences under current state laws. Some states do not specifically recognize water conservation and transfer as beneficial uses and limit purchases of water for instream purposes. Therefore, limitations exist on the extent to which transfers can alleviate national problems of inadequate water supplies for urban areas and for instream purposes and of environmental degradation. Such state restrictions also will tend to reduce the benefits to the overall economy of the western United States as water flows from uses with relatively low economic value to those with high economic value. If water is not used efficiently, the demand for new supplies, and possibly the pressure for federal funding for these supplies, can increase.

Some states do not adequately consider the impacts on communities and the environment in their transfer review processes. Yet, in some cases, water from federal projects has helped the surrounding communities develop. The economy, culture, and environment are shaped at least partly by the availability of inexpensive federal water. By allowing this water to be removed from communities without considering the impacts, the federal government could unintentionally harm the communities it helped create.

Enact Federal Standards for Beneficial Use and Third-Party Review

The federal government could make the consideration of the impacts of transfers on the environment and on communities part of its own review process. This approach would ensure that the concerns not always addressed at the state level are addressed at the federal level. Federal laws could also encourage efficiency though clear congressional directives indicating that conservation, transfer, and instream uses are beneficial

uses of water provided from federal facilities. Such laws would overcome obstacles in state laws on water rights.

However, developing specific federal review procedures for federal projects throughout the western states would be difficult. As we discussed in chapter 3, choosing appropriate strategies for addressing third-party impacts is a complex and site-specific process. It requires the consideration of local economic, social, and environmental conditions and the recognition of existing strategies in each state and their effectiveness. Furthermore, mandating additional federal approval requirements could add transaction costs, uncertainty, and delays to water transfers and encourage buyers to avoid purchasing water provided from federal facilities. Buyers may seek out other water sources to avoid satisfying federal approval requirements in addition to state requirements.

Improving efficiency by authorizing conservation, transfer, and instream uses as beneficial uses of water provided from federal facilities would be less complicated than addressing third-party impacts. Reclamation law currently indicates how the Congress wants Bureau-provided water to be used, such as through acreage limitations for irrigation water and project authorizations indicating the purposes for which water can be used. In a similar way, the Congress could identify beneficial uses of project water as including instream uses and transfers to encourage greater efficiency.

Encourage States to Make Changes in Their Water Laws

The federal government could encourage the states to change their water laws to address federal concerns. State laws have been changing to recognize a wider range of water values, but changes have been uneven. Some states now recognize conservation and instream flow uses as beneficial and have begun considering public interest concerns, such as impacts on the environment and on communities, in transfer approval processes. The Western Governors' Association has encouraged the states to promote more efficient use of water through changes in state laws and procedures related to the conservation of water, institutional measures to facilitate water transfers, and measures to protect the public interest during transfers.

Nevertheless, in many states beneficial-use laws can still impede or discourage transfers, or conversely, the laws may allow transfers to occur without addressing certain environmental and community impacts. Furthermore, most states do not allow parties other than the state to

purchase or maintain instream flow rights, thereby restricting some environmental or recreational users from the market.

To encourage further changes, the federal government could provide the states with incentives to change their water laws. Under this approach, the states that demonstrate consideration of the entire range of water values and interests associated with water provided from federal projects would be allowed to use this water more efficiently through water transfers, without federal mandates beyond the current requirements for transfer approval. This approach has the advantage of allowing the states to satisfy federal concerns through procedures appropriate to the specific needs and problems of each state, with less federal involvement than enacting federal standards.

Addressing Indian Water Rights

The quantification and administration of Indian water rights raise questions about the interpretation of decisions by the U.S. Supreme Court and other courts, the issue of sovereignty, and the consideration of both Indian and non-Indian water users. The continued quantification of tribal rights through negotiated settlements and congressional action will reduce the uncertainty about water rights. Confirming tribal authority to transfer water should promote economic efficiency, yet the federal trust obligation to guard against waste suggests that federal approval may still be appropriate on a case-by-case basis. However, questions about administration of this water, such as for non-Indians on or off reservations, remain. Answering these questions and finding ways to resolve water rights conflicts will require an in-depth study beyond the scope of this report.

Options to Increase Efficiency

Increasing the water rates paid by federal water users is another method for improving efficiency and encouraging water conservation, although not necessarily to the same extent as markets. This approach would affect federal water users differently.[1] Raising water rates imposes a financial burden on current water users, while the opportunity to transfer water can provide financial benefits. On the other hand, raising rates can enhance federal revenues more significantly, depending on the how high the rates are raised. This occurs because all of the revenues from higher rates are returned to the federal government, while in a market, the seller retains a portion of the water's sale price.

[1]See Water Subsidies: Impact of Higher Irrigation Rates on Central Valley Project Farmers (GAO/RCED-94-8, Apr. 19, 1994).

The Congress has addressed issues about the value of water markets, reducing legal impediments to water transfers, addressing third-party impacts, and the role of the federal government in California's Central Valley Project through the CVP Improvement Act. How best to address water transfer issues in other locations will vary, depending upon environmental and economic conditions and state laws. The specific policy decisions made for water use in California are not necessarily appropriate for other states. Given the potential benefits of water markets, these issues should be considered to develop a federal transfer policy for other western states as well.

Matters for Congressional Consideration

Ultimately, whether to encourage more widespread market transfers of federally provided water as a way to address water supply and environmental problems and promote economically efficient water use is a policy decision for the Congress. Another option for improving efficiency and encouraging conservation is increasing the water rates paid by federal water users.

If the Congress decides to further encourage water transfers, it should remove legal impediments in federal reclamation law and other water development laws by

- amending the Water Supply Act of 1958 to give the Corps of Engineers the authority to reallocate existing water storage space capacity in all projects for any purpose requested by a water storage purchaser, subject to the Corps' approval, without requiring construction or expansion of reservoir storage capacity;
- amending reclamation law to specifically allow transfers of water outside of projects' authorized service areas to all beneficial uses, regardless of contract restrictions, with agency approval;
- abolishing appurtenancy requirements and reclamation law provisions that limit transfers by prohibiting reductions in irrigation efficiency, requiring no practicable alternative source of water, and requiring the permission of existing water users in the project; and
- amending the Warren Act to allow the Bureau of Reclamation to approve the conveyance of nonfederal water in federal facilities for purposes other than irrigation.

In coordinating federal policy with the existing state laws governing water use, the Congress should consider whether to (1) continue to rely on the states' procedures governing third-party impacts and beneficial use;

(2) make consideration of the environmental and community impacts of transfers part of the federal review process and clearly indicate that conservation, transfer, and instream uses are beneficial uses of water provided from federal facilities; or (3) encourage the states to make further changes in their laws to meet desired goals.

Agency Comments

The Department of Defense did not agree that the Congress would need to consider giving the Corps of Engineers the authority to reallocate existing water storage space capacity in all projects for any purpose. It maintained that it has sufficient authority under the Water Supply Act of 1958 to include M&I storage in the Corps' reservoirs through operational changes without requiring construction or expansion of storage capacity. In our opinion, congressional authorization is necessary to add M&I as an authorized project purpose without structural modification. The Department of the Interior did not comment on our Matters for Congressional Consideration. Agency comments and our responses are presented fully in appendixes III and IV.

Strategies for Addressing the Impacts of Water Transfers on Third Parties

Various strategies for mitigating the possible adverse third-party impacts of water transfers are used in western states, have been discussed in the academic literature, or have been considered in legislative proposals. We analyzed 14 general strategies to determine each strategy's effectiveness in addressing the third-party impacts and for minimizing the impediments they add to transfers.

GAO's Approach to Analyzing Strategies

The overall objective of water transfer policies involves balancing two goals: adequately addressing the adverse impacts on third parties without unnecessarily preventing beneficial transfers from occurring—either through outright prohibitions or cumbersome impediments. For our analysis, therefore, we examined whether 14 strategies would address the two general policy goals of addressing the impacts on third parties and minimizing the impediments that the strategies can add to approval processes.

The first policy goal involves addressing the economic and social impacts described in chapter 2 and maintaining environmental surface water, groundwater, and soil conditions. Impacts are addressed by the strategy if the strategy accounts for the significance of the impact and eliminates or reduces the adverse impacts to acceptable levels. Conditions are maintained if the strategy ensures that pre-transfer conditions are maintained at existing or better levels. Lower levels can be allowed when they are based on acceptable standards.

The second policy goal addresses the impediments that buyers and sellers may face if the strategy is implemented. In general, the strategies for addressing the third-party impacts of water transfers can add impediments to transfers by increasing the transaction costs, the time required to effect transfers, and the uncertainty about whether and how a transfer will occur. Such strategies may also prohibit some transfers from occurring, regardless of the value of the transfer to the buyers and sellers, thereby preventing water from going to an economically higher-valued use. These impediments occur primarily because adopting the strategies adds requirements to the approval process. Transaction costs, delays, and uncertainty can impede and discourage transfers: Transaction costs reduce profitability, uncertainty prevents applicants from knowing the financial outcome of the transfer, and delays add to costs and uncertainty. These factors all reduce the appeal of transfers. For our analysis, we

determined the positive and negative aspects of each strategy on the basis of the extent to which it reduced additional impediments.[1]

Conversely, depending on the circumstances, the strategies can reduce impediments if they allow the parties to avoid more costly, time-consuming, and uncertain forms of protest, such as litigation against transfers in the courts or the adoption of legislation to stop a transfer. We did not consider whether more costly forms of protest were available to third parties.

The results of our analysis are based on our review of the literature and on interviews with water market professionals as well as on responses provided by outside reviewers. We asked 35 professionals with experience in water markets to review our analysis and rate each strategy in terms of its effectiveness in addressing the third-party impacts; 23 responded. Reviewers indicated whether they agreed with our conclusions on each strategy's general effectiveness in addressing (1) the third-party impacts and (2) the impediments they add to transfers. While most reviewers generally agreed with our analysis, many qualified their agreement with comments indicating exceptions to some general conclusions and expressing concerns about the implementation of some strategies. We summarized those ideas expressed by more than one reviewer in our discussion of each strategy and revised our conclusions on the basis of the reviewers' responses, where appropriate. Comments made by only one reviewer are not included in our results unless indicated. The reviewers also rated each strategy as excellent, good, fair, or poor in addressing some third-party impacts. (The reviewers who commented on our analysis are listed in app. II.)

We analyzed the effectiveness of each strategy alone—not in conjunction with other strategies—to isolate the benefits or impediments that might result specifically from the strategy under consideration. However, we recognize that the strategies are likely to be used in tandem. We did not distinguish whether the strategies would be enacted at the state or federal level; rather, we examined the effectiveness of the option, if enacted, at any governmental level. We also did not examine in detail which types of transfers are likely to cause certain types of impacts or be impeded by certain strategies, although we have made some general conclusions in chapter 3.

[1]These positive and negative aspects flow from the perspective of buyers and sellers wishing to transfer water. They do not necessarily reflect positive and negative aspects from the perspective of overall efficiency or societal concerns.

Strategies Vary in Their Effectiveness

The strategies vary in their effectiveness in addressing certain third-party impacts and in the impediments they add to the transfer approval process. Moreover, each transfer situation is unique, and the strategies may effectively address certain impacts in some circumstances, but not in others.

Strategy 1: Require a Public Interest Review

Before approving water transfers or the appropriation of new water rights, many states currently consider their impact on the public interest through a public interest review. Those transfers determined not to be in the public interest are modified or are not allowed. Typically, proposed transfers are announced through public notice, and concerned parties can submit protests describing their concerns. The concerns may be addressed further at a public hearing. Whether or not a transfer is in the public interest is usually decided by the state engineer or other water resource officials. The states vary in how the public interest is defined and in who is allowed to protest. Economic impacts and impacts on fish and wildlife may or may not be considered.

The federal government already conducts public interest reviews for certain federal actions. For example, the Corps of Engineers conducts a public interest review before approving the permits required under various environmental laws for the discharge and disposal of dredged material into U.S. waters and the ocean. The Corps solicits information from local, state, and other federal agencies, as well as from the general public, and considers many factors during its public interest review, such as compliance with federal laws and impacts on economies, the environment, historic values, fish and wildlife, recreation, and the water supply. To reduce or avoid duplication, the Corps develops joint procedures with local, state, and other federal agencies, and applications may be processed jointly with the state.

Rating[2]

Most reviewers rated public interest review as good or excellent. However, some stated that its effectiveness depends on whether or not mitigating action will actually be implemented as a result of the review and what the standards for decision-making are. Some noted that it can result in gridlock.

Addressing Third-Party Impacts

The reviewers generally agreed with GAO's conclusion that a public interest review can address most third-party concerns if all of the concerned

[2]Rating comments include general criticisms of strategies made by reviewers in response to our analysis. They are not necessarily provided as explanations of reviewers' ratings.

parties or their representatives—including government agencies—have an opportunity to become involved in the process and if the definition of the public interest includes the impacts on all parties. Conversely, if certain groups are not given the opportunity to protest or are not included in the definition of public interest, it is likely that the concerns of less powerful groups will not be considered.

However, the reviewers expressed concern about the difficulty of getting all affected third parties represented in the process. Some groups may be overlooked or be less well-funded and prepared than others. Some reviewers indicated that if the definition of the public interest includes consideration of all of the impacts, they may be considered by the reviewing agency, whether or not the affected groups can participate in protests or hearings.

The reviewers qualified their responses on the environmental impacts. Some indicated that the lack of access to reliable data on the environmental impacts, particularly groundwater and surface water impacts, can limit the effectiveness of addressing these impacts. It is technically difficult to determine these impacts, and the necessary data do not always exist.

Minimizing Impediments

With public interest reviews, the approving water agency often may either approve, deny, or conditionally approve transfers pending changes in terms and conditions to address the third-party impacts identified. If this is the case, then a public interest review does not prohibit certain types of transfers from occurring outright. Transfers with adverse impacts can be approved if the impacts are mitigated through changes in transfer terms and conditions. Transfers can proceed so long as the buyers and sellers value the sale enough to make the changes. If mutually satisfactory changes cannot be found to mitigate harm to the public interest, the transfer can be denied.

Extensive review and consideration of impacts can add impediments to transfers by adding significant costs, delays, and uncertainty to the approval process. The applicants and protesters may need to hire lawyers, engineers, and other experts to determine the impact of the proposed transfers, and the outcome of the review is uncertain. The clearer the definition of the public interest, the less additional cost, delay, and uncertainty.

The reviewers generally agreed with these conclusions, but some noted that some transfer prohibitions and transaction costs resulting from a public interest review may be justified because of the potential impacts. Some reviewers stated that the public interest reviews may not add significant transaction costs, depending on the existing system for transfer approval, and may even reduce overall costs and uncertainty in the long run if costlier fights, such as litigation in the courts, are avoided.

Strategy 2: Perform a Comprehensive Impact Assessment

An impact assessment involves predicting the likely impacts of proposed transfers to allow the consideration of mitigating alternatives, including the alternative of no transfer at all. For example, NEPA requires federal agencies to complete environmental impact statements for all major federal actions significantly affecting the quality of the human environment. Some states have similar requirements at the state level. Currently, the impacts examined under NEPA are primarily environmental, and studies are completed only for major actions with significant impacts. This requirement does not necessarily include all water transfers. The impact assessment strategy would involve a NEPA-like approach, with a more comprehensive analysis to assess the economic or social impacts as well as the environmental impacts.

Rating

The reviewers did not agree on a rating for impact assessment—similar numbers rated it poor, fair, or good; a few rated it excellent. Some expressed concern that it is too expensive, complex, labor-intensive, and time-consuming and that no one is accountable for the decision-making process. Some indicated that it is more desirable for large transfers but inappropriate for small transfers, presumably because of the high costs and time involved. Some felt it would be better for environmental impacts than for others, such as social impacts, that are difficult to define, quantify, and evaluate.

Addressing Third-Party Impacts

The reviewers generally agreed with GAO's conclusions that impact assessments that examine the economic, social, and environmental impacts can consider all community concerns and environmental conditions and can identify alternatives to mitigate the impacts. However, the reviewers indicated that the key issue on effectiveness is how the impact assessment is used and whether it would actually lead to mitigation. The current federal model for impact assessment, NEPA, does not by itself require that any particular action be taken—it requires only that the impact assessment be completed and that impacts that may trigger other environmental laws are identified. The reviewers' comments

indicate that to be effective, the process must have substantive standards for decisionmakers to follow in connection with how the assessment should be used.

Minimizing Impediments

Comprehensive impact assessments are similar to public interest reviews in their impediments. They do not prohibit certain types of transfers outright; they can identify alternatives that can mitigate the impacts and still allow transfers to occur. However, such assessments can add cost, time, and uncertainty because they are labor-intensive.

Strategy 3: Compensate the Community

Compensation attempts to improve the condition of the community from which a water rights holder is selling water by providing benefits that offset the losses imposed by the transfer. For example, compensation might include direct payments to local governments to compensate for losses to the local tax base, paying a severance tax on water removed from rural areas to compensate for losses from reduced economic activity, per capita payments, dedication of new parklands, or the establishment of a museum or cultural institute. For purposes of our analysis, we assumed that compensation is paid to the community, not to private parties, and can be negotiated on a case-by-case basis.

Rating

Most reviewers rated compensation as fair or good. Some expressed concern that many impacts cannot be monetarily compensated and that the effectiveness in addressing some impacts depends on what the local government does with the money. Some felt that some sort of formula or backstop is necessary to determine an appropriate level of compensation. Otherwise, some parties will never be satisfied.

Addressing Third-Party Impacts

Compensation paid to the local community can be an effective way to address some impacts, if the compensatory funds are dedicated to those impacts and if the concerned parties have the opportunity to be involved in the process. For example, the reviewers generally agreed with GAO's conclusion that compensation can address economic impacts by offsetting the economic losses that can be caused by water transfers. Some reviewers noted, however, that not all economic impacts may be compensated. For example, although short-term economic concerns may be addressed, the long-term impacts on economic development of removing water from the area may not be. In addition, the impacts on individuals may not be compensated if payment is made to the community government.

Similarly, compensation can pay for replanting agricultural fields to avoid adverse changes in soil conditions. However, the reviewers noted that in some cases revegetation is not possible or will not solve all soil problems. Farming can alter the soil to such an extent that native plants can no longer be grown where crops were grown.

The reviewers agreed with GAO's conclusions that many other impacts cannot be mitigated through compensation, including unquantifiable social values, such as lifestyle, and environmental changes in surface and groundwater conditions. However, some reviewers noted that compensation can help address these impacts in some cases. For example, new social services or compensation that provides new jobs or sources of community pride can help mitigate social impacts. Similarly, if compensation is used to purchase replacement water or money is used to mitigate environmental harm, surface and groundwater impacts can be mitigated, in some cases.

Minimizing Impediments

Compensation is similar to the previous two strategies in the impediments it can add. It does not prohibit transfers outright—transfers can proceed so long as buyers and sellers value the sales enough to negotiate and pay the compensation and still realize gains. However, compensation increases the cost of a transfer by the monetary value of the compensation and can add delays and uncertainties if it is negotiated after the transfer is proposed.

Strategy 4: Rely on Ad Hoc Negotiations Among Affected Parties

Ad hoc negotiation allows the affected parties to discuss their concerns and interests with one another and reach a mutually satisfactory agreement on the terms of the transfer. For example, if environmental impacts can be mitigated by changing the timing of a transfer, the transferrer may agree to modify the transfer. If economic concerns can be addressed through compensation, the parties can agree on appropriate compensation.

Rating

Most reviewers rated ad hoc negotiation as poor or fair. A primary concern was whether the parties to the transfer are required to negotiate. The transferring parties must have some incentive to negotiate with the affected groups—whether it be a law requiring it, a more complicated review under a formal process, or the fact that the affected groups have the power to stop the transfer some other way.

Addressing Third-Party Impacts

Because the negotiations are ad hoc, less powerful groups may be excluded and their concerns may not be considered. Although the negotiations may be effective in addressing the concerns of those parties who are involved, this option alone does not ensure that any particular concern will be addressed or conditions maintained.

The reviewers agreed with GAO's conclusion that many affected parties can be left out of ad hoc negotiations. Some felt that the economic interests are the most likely to be involved in the process, and some indicated that only those parties with the power to stop the transfer in some other way will be considered by transfer applicants in the negotiations. Conversely, a few thought that the informal nature of ad hoc negotiations makes it easier for underfunded groups to participate or that the parties to transfers may understand that all affected groups should be included.

According to the National Academy of Sciences,[3] negotiated resolutions that are not required by water transfer laws produce uneven and incomplete results. Some parties will be treated better than others, and some will be overlooked. Some transfers will entail high public visibility and political interest to empower affected parties, while others will not. Furthermore, the parties with an arguable legal right under some statute and the parties with access to legal mechanisms to delay or increase the costs of a transfer have greater bargaining power in the negotiations.

Minimizing Impediments

Ad hoc negotiations are similar to previous strategies in the impediments they can add to transfer approval. However, the costs, delays, and uncertainty may be less than those incurred through a formal hearing process. Experts are not necessarily required, and compromises can be reached directly among the concerned parties. Some states rely on negotiation as an option to informally resolve some concerns to speed up the formal process before a formal hearing is called.

Strategy 5: Institute a Right of First Refusal

Under this strategy, the water users within a designated area, such as a water district or basin of origin, have first priority in purchasing the water proposed for transfer to a prospective buyer outside of the area, on the same terms and conditions. As a result, a transfer of water to an economically higher-valued use occurs, but the water users within the area or district have the opportunity to purchase the water before others do.

[3]Water Transfers in the West: Efficiency, Equity, and the Environment, Water Science and Technology Board, National Research Council (Washington, D.C.: National Academy Press, 1992).

A version of this approach was included in the Central Valley Project (CVP) Improvement Act, which allows individuals as well as water districts to transfer CVP water to any other California user. As enacted for the CVP, the right of first refusal must be exercised on the same terms and conditions that were negotiated between the seller and the initial prospective buyer. The new buyer within the area must compensate the initial prospective buyer for the transaction costs associated with the development and negotiations of the transfer, such as hydrologic studies.

Rating

Most reviewers rated right of first refusal as poor or fair. Some felt that it is inadequate alone but is useful in conjunction with other methods.

Addressing Third-Party Impacts

The effectiveness of the right of first refusal depends in part on whether a local buyer within the area can pay the market price being offered outside of the area. If local buyers come forth, the local economy may be protected. If no buyer is available, the water leaves the area and the economy may experience losses. Local buyers will not always be available. In cases of transfers from rural agricultural areas to urban areas, it is unlikely that local users can often meet the market price that urban areas are willing to pay for water. The full value of water in the local community may include nonmarket values, such as social values that cannot be reflected in a market price. Even if the right of first refusal is exercised, this strategy may not address social impacts or maintain environmental conditions, because water will be transferred from one user to another regardless of impacts. For example, water that is transferred from traditional irrigation uses to resort development in the same area may still threaten existing lifestyles.

The reviewers generally agreed with GAO's conclusion that it is unlikely that local buyers could meet the market price, but some noted that a right of first refusal does provide an opportunity for the community to retain the water. It is possible that the water could be purchased by local businesses, by districts, or with government subsidies. Local purchasers may buy the water for social or environmental reasons. Moreover, if the right is exercised, many impacts should be less than if the water left the area.

Minimizing Impediments

This strategy by itself does not prohibit transfers because some transfer—either the initial transfer outside of the area or a transfer within the area—will be allowed to proceed. Compensating the negotiation costs and allowing others to intercede in the transfer increases transaction costs and delays, although some reviewers felt that the increases would not be

great. This strategy creates uncertainty for potential buyers outside of the area—they may expend time, energy, and money to negotiate the transfer, yet another buyer can get the water instead.

Summary of Strategies 1 Through 5

Table I.1 summarizes the conclusions for strategies 1 through 5 on their general effectiveness in addressing the five third-party impacts (indicated by Y or N)[4] and minimizing impediments (indicated by positive and negative aspects). However, the conclusions summarized in table I.1 are general and should not be assumed to hold in all cases. As indicated in the text for each strategy, each transfer situation is unique, and the strategies may effectively address certain impacts in some circumstances, but not in others. Therefore, table I.1 should only be considered with the accompanying text for each strategy.

[4]The conclusions presented in table I.1 were agreed to or agreed to with qualifications by a clear majority of the reviewers (at least three-fifths), although in some cases other reviewers disagreed. Many reviewers qualified their agreements with exceptions and comments. If no clear majority generally agreed or disagreed with our conclusions, we indicated this uncertainty with Y/N.

Table I.1: How Strategies 1 Through 5 Would Address Third-Party Impacts and Minimize Impediments

	(1) Public interest review[a]	(2) Comprehensive impact assessment	(3) Compensation to community[a]	(4) Ad hoc negotiations	(5) Right of first refusal
Rating by reviewers (n = 23 reviewers)	Good or Excellent (n = 18)	No consensus	Fair or Good (n = 18)	Poor or Fair (n = 17)	Poor Fair (n = 16)
Policy goal: Addressing third-party impacts					
Economic[b]	Y	Y	Y	N	N
Social[b]	Y	Y	N	N	N
Surface water[c]	Y	N	N	N	N
Groundwater[c]	Y	N	N	N	N
Soil[c]	Y	Y	Y	N	N
Policy goal: Minimizing impediments	Positive: Do not prohibit certain transfers from occurring outright; they allow flexibility in transfer terms and conditions to allow transfers to occur if changes can address identified third-party impacts. Negative: Can add significant transaction costs, time, and uncertainty to the approval process.				

KEY
Y(es) - Policy goal is likely to be achieved

N(o) - Policy goal is unlikely to be achieved; the strategy does not address the impact, although incidental benefits may result from the policy.

[a]Y(es) responses are valid only if all interested parties have the opportunity to become involved in the process.

[b]Economic and social concerns are addressed by the strategy if the strategy accounts for the significance of the impact and eliminates or reduces the adverse impacts to acceptable levels.

[c]Surface water, groundwater, and soil conditions are maintained if the strategy ensures that pre-transfer conditions are maintained at existing or better levels. Lower levels can be allowed when they are based on acceptable standards.

Strategy 6: Rely on Water or Irrigation District Veto Power

Several types of water and irrigation districts are chartered under state laws to manage water resources. Districts are usually initiated by local vote and governed by elected or appointed boards to serve geographic areas within designated boundaries. The districts were originally organized to provide local control over water delivery and to secure financing for expensive water supply projects. Irrigation districts have characteristics of both public and private entities—they may have taxing and assessment authority, tax-exempt status, and the ability to issue bonds. However, they are controlled by private landowners and operated for the benefit and profit of the members of the district, not for the general public.

Voting varies by state and by type of district. In some cases, only landowners or agricultural landowners within the districts are allowed to vote. Furthermore, while some districts have a one-person/one-vote system, other districts base votes on land acreage, including systems in which each landowner casts one vote for each acre owned. Some states require the district's approval before water is transferred outside of the district's service area. Other water organizations also distribute water to members; however, the Bureau largely contracts with water and irrigation districts.

Under strategy 6, the district veto power strategy, the reviewing agency would rely upon the district's judgment about whether water should be transferred to a purchaser outside of the district.

Rating

Almost all reviewers rated this strategy as fair or poor. Many stressed that districts reflect their own private interests, not broad public interests, and are likely to not consider many third-party impacts. In addition, the reviewers indicated that districts are more likely to veto transfers, because they encroach on district power, than to approve transfers. However, one reviewer indicated that districts do have legitimate concerns and should be able to veto a transfer if it substantially increases the cost or difficulty of continued service to customers.

Addressing Third-Party Impacts

The reviewers disagreed about whether or not economic impacts would be addressed with this strategy. Some agreed that impacts on agricultural communities are likely to be addressed, because it is in the district's interest not to have the local agricultural economy decline. However, the reviewers noted that not all economic impacts will be addressed. The districts will be mostly concerned with their own economic impacts—not with others outside of the district, such as the local community, the state, or the region.

Furthermore, as currently structured, the districts may not represent all interests in the community and may not have the expertise necessary to predict the social or environmental impacts of transfers. Therefore, all social concerns may not be addressed, and the environmental conditions may not be maintained. The reviewers agreed, but some noted that some social concerns will be considered by districts. In addition, if the districts veto transfers, the status quo is maintained and environmental impacts will not occur.

Minimizing Impediments

Districts' veto power can impede transfers. If districts are free to determine their own approval criteria, these criteria can vary. Depending on the criteria chosen, the additional transaction costs and time delays to meet these criteria would vary. If the criteria for transfer approval are clearly established, the additional costs, delays, and uncertainty will be reduced. Conversely, if the criteria are not clearly established, there will be considerable uncertainty for buyers and sellers, and they may incur additional costs and delays in satisfying uncertain criteria. Furthermore, if the districts are free to develop their own criteria, they are free to prohibit some or all transfers outright and maintain their control over the water, whether or not individuals would rather sell it.

Strategy 7: Provide Local Governments With Veto Power

The local government veto strategy is similar to the water and irrigation district veto approach, except that a democratically elected body of local government, such as a county board of supervisors, would decide whether a transfer out of the local area should proceed.

Rating

Most reviewers rated this option as fair or poor. A few rated it good or excellent.

Addressing Third-Party Impacts

If the government body is democratically elected and representative of the entire community, all community concerns should be addressed. However, the reviewers stressed that only local economic and social concerns will be addressed—not those outside of the local jurisdiction. Furthermore, some expressed concern that the elected officials may not represent all interests in the community.

The reviewers disagreed over whether environmental impacts will be addressed. Many indicated that local governments may not be competent and may not have the expertise necessary to make decisions about these impacts, or they may not be concerned about these impacts. In addition, local governments may not be concerned about the regional, basinwide, or downstream impacts resulting from transfers.

Minimizing Impediments

As with district veto power, the additional transaction costs and time delays to meet criteria will vary, depending on the criteria chosen. If the criteria for transfer approval are clearly established, the additional costs, delays, and uncertainty will be reduced. Conversely, if the criteria are not clearly established, there will be considerable uncertainty for buyers and sellers, and they may incur additional costs and delays in satisfying uncertain criteria. If local governments are free to develop their own

criteria, they are free to prohibit some or all transfers outright and maintain their control over the water, whether or not individuals would rather sell it.

Strategy 8: Rely on District Veto Power With Criteria Specified

Strategy 8 is another variation of the district veto strategy that would require water and irrigation districts to follow specified criteria in reviewing and vetoing transfers, to ensure that transfer decisions are made on the basis of all community concerns—not just district concerns—and to avoid arbitrary vetoes. Districts could not veto a transfer unless it meets the criteria, and vetoes would be subject to administrative review if considered arbitrary. A version of this option was included in the Central Valley Project Improvement Act. Among other things, the act allows individuals, as well as water districts, to transfer CVP water to any other California user.

Rating

The ratings for this strategy varied greatly. The responses indicate that some think it is unrealistic to assume that districts will consider other third parties in an unbiased way.

Addressing Third-Party Impacts

The reviewers generally agreed theoretically with GAO's conclusions that if the criteria specify that all community and environmental concerns are included, then all concerns will be addressed and all environmental conditions can be maintained. However, they expressed doubts that this approach would work and that districts could change their focus so significantly to protect third-party interests that do not involve their members.

Minimizing Impediments

If the criteria for district veto power are clearly specified beforehand, this strategy would reduce additional impediments by reducing the uncertainty, transaction costs, and delays associated with district veto power. Applicants can form expectations about the outcome of their proposals and can focus on satisfying the specified criteria. However, depending upon the criteria, certain types of transfers may be prohibited outright, regardless of the value to buyers and sellers.

Strategy 9: Require Comprehensive Planning to Identify the Public Interest

Comprehensive planning gives citizens of the community the opportunity to help define what is meant by the public interest in the community and what impacts and local values should be considered when reviewing proposed transfers. Such planning could be used in conjunction with a

public interest review process to clarify or prioritize the values included in the public interest.

Rating

Most reviewers rated planning as good or excellent. However, some expressed concern that plans are too general and speculative to anticipate all relevant impacts in each transfer situation; therefore, it is difficult to predict how the plan will hold in each case and how useful it will be.

Addressing Third-Party Impacts

If all interested parties or their representatives—including government agencies—have the opportunity to become involved in the process, then all community concerns should be addressed and all environmental conditions maintained. Conversely, if certain groups are not given the opportunity to be involved, it is likely that the concerns of these often less powerful groups will not be considered. The reviewers generally agreed with these conclusions, but some expressed concern that not all affected interests will get involved. They noted that it is very difficult to ensure that some groups are not overlooked. Some indicated that public input and agreement on the plan are crucial to its effectiveness.

Minimizing Impediments

The reviewers generally agreed with GAO's conclusions that identifying community values before transfers are proposed can reduce the transaction costs, time delays, and uncertainty associated with public interest reviews, because the public interests are more clearly defined and prioritized. Some reviewers, however, noted that developing plans is slow and expensive.

The reviewers also agreed that planning can be used primarily to define the public interest more clearly and allow flexibility and balancing of interests, or it can identify the values that will be protected rigidly from all transfers, regardless of the value of the transfer to the buyer and seller. Depending upon how rigidly the preferences and criteria are set, this strategy could prohibit certain transfers from occurring outright, regardless of the value to the buyers and sellers.

Summary of Strategies 6 Through 9

Table I.2 summarizes the conclusions for strategies 6 through 9. As with table I.1, the conclusions summarized in table I.2 are general and should not be assumed to hold in all cases. Exceptions are discussed in the text above for each strategy.

Table I.2: How Strategies 6 Through 9 Would Address Third-Party Impacts and Minimize Impediments

	(6) Irrigation or water district veto	(7) Local government veto[a]	(8) Irrigation district veto power with criteria specified[b]	(9) Comprehensive planning to identify public interest[a]
Rating by reviewers (n = 23 reviewers)	Poor (n = 15)	Poor or fair (n = 17)	No consensus	Good or excellent (n = 16)
Policy goal: Addressing third-party impacts				
Economic[c]	Y/N	Y	Y	Y
Social[c]	N	Y	Y	Y
Surface water[d]	N	Y/N	Y	Y
Groundwater[d]	N	Y/N	Y	Y
Soil[d]	N	Y	Y	Y
Policy goal: Minimizing impediments	Positive: If criteria are clearly established, additional costs, delays, and uncertainty will be reduced.		Positive: Can reduce transaction costs and be more timely and certain compared to previous options; approval criteria more specifically identified beforehand.	
	Negative: If criteria are rigid, some types of transfers may be prohibited outright. If criteria are unclear, can add transaction costs, delays, and uncertainty.		Negative: Depending upon how rigid the criteria are, it might prohibit certain transfers outright.	

KEY

Y(es) - Policy goal is likely to be achieved.

N(o) - Policy goal is unlikely to be achieved; the strategy does not address the impact, although incidental benefits may result from the policy.

Y/N - Reviewers disagreed whether the strategy would address these impacts.

[a]Y(es) responses are valid only if all interested parties have the opportunity to become involved in the process.

[b]Y(es) responses are valid only if all third-party impacts are included in the criteria to be considered.

[c]Economic and social concerns are addressed by the strategy if the strategy accounts for the significance of the impact and eliminates or reduces the adverse impacts to acceptable levels.

[d]Surface water, groundwater, and soil conditions are maintained if the strategy ensures that pre-transfer conditions are maintained at existing or better levels. Lower levels can be allowed when they are based on acceptable standards.

Strategy 10: Establish Minimum Streamflows or Lake Levels

Some states establish minimum streamflows or lake levels to protect environmental conditions, such as water quality and fish and wildlife habitat, that may be harmed by changes in surface water resulting from

transfers and new water rights. Under this strategy, water transfers that would reduce the water in the protected water body below the minimum level would not be allowed by the reviewing agency. This strategy can be effective only for those water bodies that have minimum levels established.

Rating

Most reviewers rated the establishment of minimum streamflows or lake levels as good or excellent. Some noted that although it is not sufficient as a general solution to all impacts, this is an effective solution for avoiding the degradation of surface water conditions. However, some also noted that these standards do not exist for many areas of the West.

Addressing Third-Party Impacts

Minimum levels will address economic and social concerns only to the extent that they relate to recreation, tourism, aesthetics, or subsistence for the poor. Other economic and social concerns, such as those related to reductions in agricultural production, will not be addressed by this strategy.

Minimum streamflows and lake levels can maintain desirable surface water conditions for the instream and reservoir values that the levels are established to protect. However, some surface water impacts, such as habitat along irrigation canals or wetlands dependent on irrigation runoff directly from fields, will not necessarily be protected. In addition, minimum streamflows and reservoir levels would not necessarily maintain groundwater and soil conditions, although some reviewers noted that minimum streamflows can help protect groundwater where surface and groundwater systems are connected. The reviewers generally agreed with our conclusions.

Minimizing Impediments

This strategy sets predetermined standards within which transfers must fall. Transfer applicants must demonstrate to the reviewing agency only that their transfers satisfy clearly established, specific standards that hold for all transfers. Therefore, this strategy has limited transaction costs, delays, and uncertainty. However, once the standards are exceeded, transfers cannot occur. Therefore, this strategy can prohibit certain types of transfers from occurring outright, regardless of the value of the transfers to the buyers and sellers.

The reviewers agreed, but some noted that such prohibitions under minimum streamflows or lake levels are not a negative result, if the levels are legitimate, because they indicate that the transfer should not occur, presumably because it would have adverse impacts.

Strategy 11: Limit the Amount of Water Transferred From the Area

This strategy would place a cap on the amount of water that can be sold from a local area, such as an irrigation district or basin of origin. Limits on the amount of water that can leave an area ensure that some water stays in the area. The goal is to preserve the local economy and way of life.

Rating

Most reviewers rated limiting transfers as fair or good. Some felt it might be useful in some areas, but not in others. In addition, some noted that reaching agreement on the cap could be difficult.

Addressing Third-Party Impacts

If the basis for establishing the cap is to protect the local economy and way of life, then restricting the amount of water that can leave an area generally would reduce adverse economic and social impacts, because the existing lifestyle would remain largely intact. However, determining an effective limit to protect existing economies and cultures is difficult, and restrictions may be arbitrary: They may be insufficient to maintain local conditions or, conversely, may be too stringent and limit the economic benefits that can occur from water transfers.

While reducing water loss might incidentally reduce adverse environmental impacts, the reviewers agreed with our conclusions that all conditions would not necessarily be maintained—transfers below the limit could occur without the consideration of these impacts, and the limits established to protect economic and social values may be too high to prevent environmental impacts. However, some reviewers noted that certain environmental values, such as surface water conditions, may be protected if they form the basis for the cap.

Minimizing Impediments

This strategy sets predetermined standards within which transfers must fall, which limits transaction costs, delays, and uncertainty. However, once the standards are exceeded, transfers cannot occur. Therefore, this strategy can prohibit certain types of transfers from occurring outright, regardless of the value of the transfers to the buyers and sellers. The reviewers generally agreed with our conclusions.

Strategy 12: Prevent or Limit Fallowing of Agricultural Land

This strategy would limit or prevent transfers that involved removing agricultural land from production, to protect the agricultural economy and way of life.

Rating

Most reviewers rated limiting fallowing as poor. They indicated that it may be harmful to limit declining agricultural economies that need to diversify their economy from realizing the economic benefits of transfers. In addition, some noted that many other economic factors can cause farmers to fallow land.

Addressing Third-Party Impacts

Limiting fallowing of agricultural land would reduce social impacts on agricultural communities because the agricultural way of life would be maintained. However, the reviewers disagreed on this strategy's effectiveness in addressing adverse economic impacts. Some noted that only some economic and social concerns are addressed—primarily agricultural concerns. Furthermore, some indicated that this strategy may actually hurt declining agricultural economies, because it limits the economic benefits that can result from transfers.

The reviewers generally agreed that this strategy would limit soil problems resulting from fallowed farmland but would not maintain other environmental conditions. For example, transfers that involve increasing irrigation efficiency rather than fallowing farmland can change surface water conditions by reducing runoff and seepage from the irrigation canals that sustain wetlands or other wildlife habitat. Similarly, irrigators may also contribute to groundwater overdraft by replacing transferred surface water with pumped groundwater to continue farming.

Minimizing Impediments

As with strategies 10 and 11, limits on fallowing set predetermined standards within which transfers must fall, which limits transaction costs, delays, and uncertainty. However, once the standards are exceeded, transfers cannot occur. Therefore, this strategy can prohibit certain types of transfers from occurring, regardless of the value of the transfers to the buyers and sellers.

Strategy 13: Prevent Transfers From Sensitive Areas With Zoning

The use of zoning would prohibit transfers out of specified areas that are determined to be sensitive to the impacts of transfers. For example, zoned areas might include areas of critical environmental concern or areas susceptible to economic decline.

Rating

Most reviewers rated zoning fair or good. Their concerns centered on the difficulty of establishing zones, such as determining what areas should be zoned, defining sensitive areas, and determining who makes zoning decisions. Such issues could be controversial and divisive.

Addressing Third-Party Impacts

The use of zoning generally will address all impacts in zoned areas because transfers from the area will not occur. However, some reviewers noted that zoned areas can experience some spillover impacts caused by transfers in neighboring unzoned areas. Zoning will not address either these spillover impacts or the other impacts of transfers that occur outside of the zoned area. Others noted that zoning does not allow beneficial transfers either, and therefore agricultural areas in decline could be hurt by this restriction. Some felt that this approach would be more effective in protecting environmental values in sensitive areas.

Minimizing Impediments

As with previous strategies, zoning sets predetermined standards within which transfers must fall, which limits transaction costs, delays, and uncertainty. However, once standards are exceeded, transfers cannot occur. Therefore, this strategy can prohibit certain types of transfers from occurring, regardless of the value of the transfers to the buyers and sellers.

Strategy 14: Tax the Transfers

Under this approach, transfers would be taxed and the proceeds used to mitigate the impacts of transfers. Taxes could be paid in money or in a percentage of the water transferred. This option is different from compensation in that taxes are pre-established amounts that hold for all transfers; they are not negotiated to address the specific circumstances of a transfer and are charged for all transfers, whether the impacts are positive or negative. A version of this option, in the form of a charge per acre-foot of water transferred, was included in the CVP Improvement Act.

Rating

Ratings for taxing transfers varied greatly; similar numbers of reviewers rated it poor, fair, or good, and a few rated it excellent. Some reviewers thought that this would be a good strategy when used in combination with other mechanisms, and some indicated that its effectiveness depends on how the tax revenues are used.

Addressing Third-Party Impacts

Taxes can offset local economic impacts and help maintain the community. They can also be used to pay for replanting to mitigate soil problems. However, taxes will address only those concerns to which the proceeds are dedicated, and as with compensation, some social and environmental impacts cannot be mitigated by a tax. Funding social services could mitigate social impacts, in some cases. In addition, some surface and groundwater impacts could be mitigated if taxes were used to keep water in the stream or to purchase replacement water (if allowed by the state) or if the tax itself is a percentage of the water transferred.

Minimizing Impediments

Pre-established transfer taxes would not add delays or uncertainties to the approval process and would not prohibit any transfers from occurring outright. So long as buyers and sellers are willing to pay the tax, water can go to other uses. However, taxing transfers can impede transfers by directly adding costs to the transfer. For example, taxes will effectively preclude some transfers that are only marginally profitable without the tax.

Summary of Strategies 10 Through 14

Table I.3 summarizes the conclusions for strategies 10 through 14. As with the previous tables, the conclusions summarized in table I.3 are general and should not be assumed to hold in all cases. Exceptions are discussed in the text for each strategy.

Table I.3: How Strategies 10 Through 14 Would Address Third-Party Impacts and Minimize Impediments

	(10) Establish minimum streamflows and lake level standards[a]	(11) Limit overall amount of water to be transferred out of the area	(12) Prevent or limit fallowing of agricultural land	(13) Zoning: Preventing transfers from sensitive areas[c]	(14) Tax the transfers[d]
Rating by reviewers (n = 23 reviewers)	Good or Excellent (n = 14)	Fair or Good (n = 16)	Poor (n = 15)	Fair or Good (n = 15)	No consensus
Policy goals: Addressing third-party impacts					
Economic[e]	N	Y	Y/N	Y	Y
Social[e]	N	Y	Y	Y	N
Surface water[f]	Y/N[b]	N	N	Y	N
Groundwater[f]	N	N	N	Y	N
Soil[f]	N	N	Y	Y	Y
Policy goal: Minimizing impediments	Positive: Limited transaction costs, delays, and uncertainty—these policy options establish specific criteria that hold for all transfers.				Positive: Timely and certain; does not prohibit any transfers
	Negative: Prohibit certain transfers outright, regardless of the value of the water to the buyer and the seller.				Negative: Adds costs

KEY

Y(es) - Policy goal is likely to be achieved.

N(o) - Policy goal is unlikely to be achieved; the strategy does not address the impact, although incidental benefits may result from the policy.

Y/N - Reviewers disagreed whether the strategy would address these impacts.

[a]Y(es) response is valid for water bodies with established streamflows or lake levels.

[b]Y/N indicates that some surface water impacts would be addressed while others would not.

[c]Y(es) response is valid only for zoned areas. Outside of zoned areas, response is negative.

[d]Y(es) response is valid only for impacts for which revenues are earmarked.

[e]Economic and social concerns are addressed by the strategy if the strategy accounts for the significance of the impact and eliminates or reduces the adverse impacts to acceptable levels.

[f]Surface water, groundwater, and soil conditions are maintained if the strategy ensures that pre-transfer conditions are maintained at existing or better levels. Lower levels can be allowed when they are based on acceptable standards.

Reviewers of GAO'S Analysis

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Comments From the Department of the Interior

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

JAN 14 1994

Mr. James Duffus III
Director, Natural Resources
Management Issues
United States General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Duffus:

The Department of the Interior (Interior), particularly the Bureau of Reclamation (Reclamation), has reviewed the General Accounting Office's (GAO) draft report, "Water Transfers: More Efficient Water Use Possible, If Problems Are Addressed" (GAO/RCED-94-35). We were pleased to see that this draft accommodated or accepted many of Reclamation's earlier comments on the preliminary draft report which were provided to the GAO at the November 16, 1993, exit conference.

Interior concurs with the recommendation to the Secretary of the Interior and will take actions to identify requirements that must be met in approving water transfers. The enclosure describes current and ongoing efforts to propose legislation and develop specific regulations.

Sincerely,

For Elizabeth Ann Rieke
Assistant Secretary
for Water and Science

Enclosure

Response to General Accounting Office Draft Report
"Water Transfers: More Efficient Water Use Possible,
If Problems Are Addressed"
(GAO/RCED-94-35)

Recommendation

The report included a recommendation for the Secretary of the Interior that "To reduce the uncertainty and confusion associated with transfers, we recommend that the Secretary of the Interior expand and clarify transfer guidance to specify the requirements that must be met in approving transfers. Specifically, the Secretary should (1) list and explain any federal reclamation laws that must be satisfied, including what conditions contract amendments would trigger Reclamation Reform Act provisions; (2) clarify the procedures and approval requirements for transfers, including when contracts would have to be amended, how rates charged for transferred water will be determined, and what third-party concerns must be addressed from the federal perspective; and (3) develop clear NEPA compliance requirements that are specific to water transfers."

Response to: (1) list and explain any federal reclamation laws which must be satisfied, including what conditions contract amendments would trigger Reclamation Reform Act provisions;

See Comment 1.

Concur. Reclamation is developing and intends to propose legislation to address Federal impediments to the water transfer process. A first step in this process is an evaluation of existing laws, Department of the Interior policy, and other guidance related to water transfers currently being conducted in the Reclamation Denver Office as a part of the legislative effort. The proposed legislation will incorporate some of the key points included in the transfer authority provided by the Central Valley Project Improvement Act (Title 34, Public Law 102-575).

The responsible official is the Commissioner of Reclamation. The target completion date for drafting the legislation is June 30, 1995.

Response to: (2) clarify the procedures and approval requirements for transfers, including when contracts would have to be amended, how rates charged for transferred water will be determined, and what third-party concerns must be addressed from the federal perspective;

Concur. There are several ongoing efforts by Reclamation to specify the requirements for water transfers. In addition to the implementation of the Central Valley Project Improvement Act, Reclamation's Lower Colorado Region has drafted rules and regulations for administering entitlements of Colorado River water in the Lower Colorado River Basin to help water users solve water demand

1

See Comment 2.

and resource problems on a local level. These regulations recognize several types of transactions: transfers, leases, exchanges, banking, and marketing of Colorado River water. These draft regulations provide specific guidelines, are innovative, and demonstrate a cooperative approach by Reclamation; they are presently being reviewed at the Departmental level.

The responsible official is the Commissioner of Reclamation. The target completion date for finalizing the Lower Colorado River Basin regulations is January 1, 1995.

Response to: (3) develop clear NEPA compliance requirements that are specific to water transfers.

Concur. We believe NEPA compliance requirements are predicated on the type and length of water transfer and should be approached on a case-by-case basis. For example, NEPA compliance for a short term (1 year or less) transfer from one farmer to another within an irrigation district may be completed through a categorical exclusion. However, a long term (or permanent) transfer from an irrigation district to a municipality out of a given river basin may require preparation of an Environmental Impact Statement. Also, NEPA compliance is being incorporated in the rule making for the Lower Colorado River Basin rules and regulations.

See Comment 3.

We intend to propose that the NEPA process regarding water transfers be an integral part of the draft legislation and draft rule making processes described in (1) and (2) above. Criteria thus developed for water transfers should preserve third-party interests and reflect national priorities. For example, Federal concerns about interstate ground and surface water issues, states' role in water management, definition of beneficial use, and third party impacts, will be reflected in the proposed legislation and rules mentioned above.

The responsible official is the Commissioner of Reclamation. The target completion date for finalizing the Lower Colorado River Basin regulations is January 1, 1995.

The following are GAO's comments on the Department of the Interior's letter dated January 14, 1994.

GAO Comments

1. The Bureau of Reclamation's effort to propose legislation that incorporates some of the transfer authority provided by the Central Valley Project Improvement Act is a positive step toward addressing federal impediments to water transfers. This act removed many legal impediments by explicitly allowing any individual or water district to transfer project water to any other California water user or agency for any purpose recognized as beneficial in the state of California. Staff in the Bureau's Policy Analysis Branch indicated to us that the proposed legislation is likely to focus on removing or reducing legal impediments to water transfers, while protecting federal interests.

However, Interior's and the Bureau's requirements for transfer approval under existing law remain unclear. The Bureau has not indicated whether it will use its evaluation of reclamation laws and agency policies and guidance to explain how transfers can be accomplished under existing law. Such clarification is needed as quickly as possible to minimize the uncertainty that will continue to occur before new legislation is completed.

2. The Bureau's efforts to specify the requirements for water transfers should include not only the Central Valley Project and the Lower Colorado River Basin, but all Bureau regions throughout the western United States. The Bureau has not indicated how it will address the recommendation in other regions.

3. While the Bureau may wish to address the NEPA requirements more thoroughly in the proposed legislation, the current requirements for transfer approval can be more clearly specified under the existing law than they now are. Some clarification is needed as quickly as possible to minimize the uncertainty that will continue to occur before new legislation is completed. As with other approval requirements, clear NEPA compliance requirements are needed for all Bureau-served areas, not just the Lower Colorado River Basin.

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

REPLY TO ATTENTION OF

03 FEB 1994

Mr. James Duffus III
Director
Natural Resources Management Issues
Resource, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Duffus:

This is the Department of Defense (DOD) response to the General Accounting Office (GAO) draft report entitled "WATER TRANSFERS: More Efficient Water Use Possible, If Problems Are Addressed (GAO Code 140874/OSD Case 9564)." The Department generally concurs with the findings and recommendations in the draft report that concern the Army Corps of Engineers program. There are, however, a few areas where additional clarification is required.

See comment 1.

First, while the term "reallocation" is an appropriate term for describing changes in the designated use of a particular portion of storage space in a reservoir from one purpose to another, a "water transfer," as the term is used in the GAO report, does not necessarily require a permanent water storage contract with the Corps. The Department bases its comments on the premise that the term "water transfer," as used in the draft report, means the sale (or resale) of Federally assisted irrigation waters in the 17 Western States by valid water rights/contract holding non-Federal entities to accommodate alternative uses of that irrigation water. The term is not used to mean the Federal sale of water supply storage to non-Federal entities.

See comment 2.

Second, the GAO states that rates charged by the Federal Government for transferred water at Corps reservoirs must be determined by the Corps and can affect the profitability of transfers. The GAO further states that the Corps has two different procedures for determining new rates--depending on how significantly the new use affects other purposes. As a point of clarification, the two procedures referenced are not dependent on how significantly the new use affects other project purposes, but they are applicable to whether the reservoir modification involves adding storage or reallocating storage. Additionally, because water transfers of irrigation waters do not necessarily require a contract with the Corps, there may be no new rates for the Corps to establish.

See comment 3.

Third, the Department concurs that the Corps has not developed specific water transfer policies and guidance. It should be recognized, however, that the Department of the Interior, Bureau of Reclamation is the predominant Federal Executive agency with jurisdiction over the sale of Federally assisted irrigation waters in the 17 Western States, including irrigation waters stored in Corps reservoirs. Therefore, the Department of the Interior has first and primary responsibility for developing policies affecting water transfers. The Secretary of the Army will request the Corps to work with the Bureau of Reclamation in their development of such policies and will direct the Corps to develop their own policies and guidance at the appropriate time.

The detailed DOD comments on the draft report findings, recommendations, and matters for congressional consideration are provided in the enclosure. The DOD appreciates the opportunity to comment on the draft report.

Sincerely,

G. Edward Dickey
Acting Assistant Secretary of the Army
(Civil Works)

Enclosure

GAO DRAFT REPORT - DATED DECEMBER 15, 1993
(GAO CODE 140874) OSD CASE 9564

"WATER TRANSFERS: MORE EFFICIENT WATER USE POSSIBLE, IF PROBLEMS ARE ADDRESSED"

DEPARTMENT OF DEFENSE COMMENTS

* * * * *

FINDINGS

- **FINDING A: Federal Water Projects and Western Water Law.** The GAO reported that the Bureau of Reclamation plans, constructs, and operates water resource projects to provide water for various purposes in the 17 Western States. The GAO pointed out that the Reclamation Act of 1902 provided for The construction of irrigation works in the western states-- to be repaid by irrigators without interest charges. The GAO noted that the project service areas and authorized purposes for Bureau projects are generally indicated in authorizing legislation for each project. In addition, the GAO explained that generic laws also affect project purposes and operations.

  The GAO further reported that most Federally supplied irrigation water is supplied by the Bureau of Reclamation. The GAO estimated that, by 1989, the Bureau projects supplied water to an estimated 26 percent of all the irrigated farmland in the 17 Western States and for municipal and industrial and other purposes. The GAO pointed out the Bureau delivers most of the irrigation water to state-established water and irrigation districts that obtain the water under contracts and distribute it to farmers. The GAO noted that the Bureau recoups a portion of the investment made by the Government to provide The water through service or repayment charges.

  The GAO also reported that the Corps of Engineers constructs dams and operates reservoirs throughout the U.S. under specific authorizing legislation for each project and generic legislation applicable to all Corps reservoirs. The GAO stated that Corps dams were constructed for flood control purposes--and some provide storage space for municipal and industrial, irrigation water, and hydroelectric power, among other purposes. The GAO pointed out that the Corps enters into contracts with water rights holders to store water in the Corps facilities. The GAO noted that, in general, the

Bureau administers contracts for all irrigation water delivered from the Corps projects in the western U.S., while the Corps administers contracts for municipal and industrial water from its projects.

The GAO found that, although Federal legislation provides some control over the use of water provided for federal projects, rights to use water generally are governed by state law. The GAO stated that all western states rely on the "prior appropriation" doctrine--i.e., a "use-it-or-lose-it" philosophy to define water rights for some or all of the surface water. The GAO explained that the prior appropriation doctrine also is based on the premise of "first in time, first in right," whereby parties who obtained water rights first, generally, have seniority for the use of water over those who obtained rights later.

The GAO stated that the Federal Government had recognized the primacy of state water law in water allocation under the Desert Land Act of 1877, as amended (19 Statute 377); section 8 of the Reclamation Act of 1902 as amended (32 Statute 388); and the Clean Water Act of 1977 as amended (91 Statute 1566). The GAO concluded that, as a result, the water provided from the Bureau projects usually is appropriated by the Bureau or by irrigators under state laws and must be applied to beneficial use as defined by the states The GAO observed that, in contrast, the Corps does not appropriate any water rights; it simply provides storage space in reservoirs for others who hold recognized water rights. (pp. 11-13/GAO Draft Report)

Now on pp. 14-16.

DOD RESPONSE: Concur.

- **FINDING B: Legal Restrictions on Project Purposes May Restrict Transfers** The GAO stated that water use from Corps projects is legally restricted by the authorized purposes for each project. The GAO reported that, according to the Corps, many projects are not authorized for all purposes--and adding other authorized purposes would often require an act of Congress, which can be time-consuming and expensive. The GAO indicated that project purposes can be added to Corps projects through congressional authorization or, if certain conditions are met, under general legislation affecting all Corps projects. The GAO pointed out that the Corps asserts the 1958 Water Supply Act also allows the Corps to add municipal and industrial water storage space to existing projects without any operational or structural change. The GAO noted that, in the past, the Corps had reallocated

some storage space to municipal and industrial purposes with only operational changes. The GAO reported that the Corps currently administers the projects under the described interpretation of the Water Supply Act. For example, the GAO stated that the Corps determined that it can reallocate storage in all of the Sacramento District projects, whether municipal and industrial supply is currently authorized or not, if the impacts to project purposes are not serious.

The GAO referenced its August 1991 report (OSD Case 834) in which it concluded that the Water Supply Act authorizes the Corps to add municipal and industrial as a purpose only if the project has been structurally modified through construction or expansion of reservoirs--not simply if operational changes occur. The GAO again concluded that Congressional authorization is necessary to add municipal and industrial water supply as an authorized project purpose without structural modification. The GAO did recognize, however that obtaining authorization though Congressional action and making structural changes to projects can be time-consuming and expensive processes for transfer applicants to carry out. The GAO also pointed out that such requirements to transfer water to municipal and industrial use may discourage transfers.

The GAO reported that the Federal Water Project Recreation Act of 1965 allows the Secretary of the Army to add recreation and fish and wildlife enhancement to existing projects--if a nonfederal party agrees to share 50 percent o The associated costs. The GAO noted, however, that the Act does not add recreation or fish and wildlife as a generally authorized purpose of the project. In addition, the GAO pointed out that under Section 6 of The Flood Control Act of 1944, as amended, if municipal and industrial water supply is not an authorized project purpose, the Corps may provide surplus water for municipal and industrial purposes. The GAO asserted that, if surplus water is needed at a later time for authorized purposes, it is no longer available for municipal and industrial water supply purposes. (pp. 77-79/GAO Draft Report)

Now on pp. 66-67.

DOD RESPONSE: Partially concur. The GAO draft report fairly represents the Department of Defense current position regarding authority to reallocate storage. However, the Department has and continues to object to the GAO conclusion that the Water Supply Act authorizes the Corps to add municipal and industrial storage at Corps reservoirs only if the project is modified through construction or expansion. The Department has made a legal interpretation that municipal and

See comment 4.

industrial storage may be added at existing Corps reservoirs though operational changes in the reservoirs without specific congressional authorization, provided such changes do not seriously interfere with existing authorized purposes.

- **FINDING C: The Corps Has Not Developed Specific Transfer Policy and Guidance.** The GAO indicated that, according to Corps officials in Washington, D.C., because the concept transfers is new to the Corps, the Corps as not yet developed specific policies and guidance to Govern the approval of water transfers. The GAO found that, as a result, transfer approval is based on existing Corps policies and guidance governing changes in water use that are included in various policy documents and regulations. The GAO concluded that a water transfer may or may not require reallocation by the Corps, depending on the extent to which it would require a change in project operations .

The GAO stated that Corps policies indicate changes in water use, including transfers, must satisfy operational, environmental, and contractual requirements necessary to protect other project purposes and the environment. The GAO concluded that, while such restrictions serve important purposes, the lack of specific guidance or satisfying all of the requirements as they relate to transfers can add to the time, cost, and uncertainty associated with transfers. (p. 80/GAO Draft Report)

Now on p. 68.

DOD RESPONSE: Concur. The Department interprets the term "water transfers", as used in the GAO draft report, to mean the marketing and resale of predominately Federally assisted irrigation water in the 17 Western States, by a valid water rights/contract holding entity to another party, and not the Government sale of reservoir storage for Water Supply. The Department of Interior is the predominate Federal Executive Agency with jurisdiction over the sale of Federally assisted irrigation waters in the 17 Western States, including irrigation waters stored in Corps reservoirs. Therefore, the Department of Interior, Bureau of Reclamation, has first and primary responsibility for development of policies affecting water transfers

See comment 5.

- **FINDING D: Operational Requirements.** The GAO reported that policies governing changes in water use in Corps

projects indicate that the impacts of transfers on project operations must be reviewed and many requirements must be satisfied before transfers can proceed. The GAO asserted the transfers that would seriously affect other project purposes could not be allowed by the Corps without Congressional authorization. For example, the GAO noted that many Corps projects were built principally for flood control purposes. The GAO indicted that, according to Corps officials, a change in project operations that would alter the flood control parameters of a project and affect the safety of local communities very likely would not be allowed--depending on the circumstances.

The GAO observed transfers that will not adversely affect other purposes, but will require a change in reservoir operation, must be reviewed to determine the necessary changes. The GAO reported that changes in the water control plan are necessary if modification to the body of water stored in a Corps project is necessary--such as a change in water flow. The GAO concluded that, because a transfer of water from seasonal agricultural use to year-round municipal and industrial use would most likely require a change to the water control plan, the public would review the new plan resulting from such proposed transfers. The GAO reported that, according to Corps officials, any transfers that affect project operations would be considered reallocations and would require reallocation studies. The GAO explained that reallocations are changes in the designated use for a particular portion of storage space in the reservoir from one purpose to another--with such reallocations allowing the Corps to enter into permanent water storage contracts with the new users. Conversely, the GAO concluded that any transfer not affecting project operations would not require a allocation of water storage space or a new contract with the Corps. The GAO noted that those types of transfers allow sellers to subcontract water directly to buyers, without requiring a new contract with the Corps. (pp. 80-82/GAO Draft Report)

Now on pp. 68-69.

DOD RESPONSE: Concur. The term "reallocation",however, requires clarification. While "reallocation" is an appropriate term to use for changes in the designated use of a particular portion of storage space in a reservoir from one purpose to another, a water transfer, as the term is used in the GAO report, does not necessarily require a permanent water storage contract with the Corps.

See comment 6.

- **FINDING E: Environmental Requirements.** The GAO stated

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that Federal environmental laws must be satisfied before transfers can proceed. For example, the GAO referenced the Fishery Conservation and Management Act of 1976, as amended, which requires the Corps to respond to recommendations or comments made by the regional Fishery Management Council when any Federal activity or action, such as a change in a water control plan, affects a fishery. In addition, the GAO stated that changes in water use, such as transfers, must also satisfy the National Environmental Policy Act requirements. The GAO noted that, under the Act, the Corps is required to conduct an environmental assessment of the consequences any change in project operations, such as water transfers, would have on the environment. The GAO pointed out that, if an assessment is not sufficient to determine the impacts an operational change would have on the environment, an environmental impact statement would be required.

The GAO found that certain Corps activities and actions are categorically excluded from the requirement to conduct either an environmental assessment or an environmental impact statement. The GAO concluded that, based on the National Environmental Policy Act and discussions with Corps officials, it is apparent that a transfer would not be categorically excluded from environmental requirements if it required any change to project operations. (pp. 82-83/GAO Draft Report)

Now on pp. 69-70.

DOD RESPONSE: Concur.

- **FINDING F: Contractual Requirements.** The GAO reported that, in the 17 Western States, the Bureau of Reclamation generally administers contacts for irrigation water from Corps projects. The GAO found that most of the Bureau repayment contracts for irrigation water stored in Corps projects do not allow for water transfers to other purposes. Furthermore, the GAO found the contracts restrict the ability of an irrigator to subcontract or transfer water to any party outside of the service district of the irrigator. The GAO reported that Bureau officials advised the contracts would have to be amended to allow water to be transferred to a municipal and industrial user. The GAO noted that Corps officials would become involved if a transfer altered project operations.

  The GAO pointed out that the Corps water storage space contracts or municipal and industrial water storage also state that such storage space cannot be use for any other purpose.

Now on p. 70.

The GAO noted, however, that the contracts do not prevent water users from selling their water to other users once it has been discharged from a Corps project. The GAO indicated that Corps officials are concerned about the impact a transfer would have on project operations, not about what happens to the water once it is evacuated from a project. Therefore, the GAO indicated that municipal and industrial water users may be able to transfer their water to others, after, it is released from the reservoir, without the approval of the Corps. (pp. 83-84/GAO Draft Report)

DOD RESPONSE: Concur.

- **FINDING G: Rates Charged**. The GAO stated that rates to be charged for transferred water must also be determined and can affect the profitability of transfers. The GAO reported that, when project purposes are added or water is reallocated to a different purpose (such as though water transfers), the Corps must calculate an appropriate rate to charge project users. The GAO pointed out that Corps policy outlines two different procedures for determining the new rates depending on how significantly the new use affects other project purposes. The GAO noted that the two procedures allow the Corps some discretion in establishing rates.

  The GAO reported that Corps officials indicated an interest in and willingness to facilitate beneficial water transfers where they are desired by state and local interests. The GAO found, however, that the Corps currently does not have plans to develop a transfer policy outside of is own reallocation and project modification policies. The GAO noted that, according to Corps officials, because the Bureau is the major Federal water supply agency for irrigation water, it would be premature for the Corps to develop a policy before the Bureau did. The GAO recognized that agriculture to municipal and industrial transfers of water from Corps projects may not be a primary concern for the Corps. The GAO noted that Corps data on project purposes indicate only 28 percent of the Corps projects in the 17 Western States contain storage space for irrigation water--and most of that water is administered by the Bureau of Reclamation. The GAO found, however, that the Corps had received requests for reallocations of reservoir storage space in recent years, not only from irrigation uses, but often from flood control to other purposes--such as fish and wildlife and municipal and industrial. The GAO stated that, in anticipation of future requests for reallocations to municipal and industrial storage space, Corps

Now on pp. 70-71.

district offices in the Pacific Northwest had been encouraged by Corps headquarters to perform reallocation studies on sufficient amounts of storage to meet anticipated new demand, rather than to perform studies on each and every request. The GAO pointed out that approach would reduce time delays and uncertainty when the reallocations are requested. In addition, the GAO noted that the Corps also recently held a workshop to familiarize its staff with the procedures to follow for water supply reallocations. (pp. 84-85/GAO Draft Report)

See comment 7.

DOD RESPONSE: Partially Concur. The GAO points out that rates charged for transferred water must be determined and can affect the profitability of transfers. The draft report further points out that the Corps has two different procedures for determining the new rates depending on how significant the new use affects other project purposes. It should be recognized however, that the two procedures for determining new rates are not dependent on how significant the new use affects other project purposes, but are rather applicable to whether the reservoir modification is adding storage or reallocating storage. Second, because water transfers of irrigation waters do not necessarily require a contract with the Corps, there may be no rates for the Department to establish.

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RECOMMENDATIONS

Now on p. 72.

- **RECOMMENDATION 1:** The GAO recommended the Secretary of the Army require the Corps of Engineers to identify existing procedures and requirements that must be satisfied for water to be transferred. (p. 86/GAO Draft Report).

See comment 8.

DOD RESPONSE: CONCUR. By 21 April 1994, the Secretary of the Army will request the Corps to consult with the Bureau of Reclamation during development of water transfer policies to determine the conditions in which their laws, policy, procedures, and contracts may allow or be revised to allow for water transfers. Within 90 days after the Bureau this policy is developed, the Secretary of the Army will require the Corps to identify existing procedures and requirements that must be satisfied for water to be transferred.

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Now on p. 72.

See comment 9.

- **RECOMMENDATION 2**: The GAO recommended that the Secretary of the Army require the Corps of Engineers to establish guidelines for the approval of water transfer--outlining the steps required to satisfy operational, environmental, and contractual requirements and how rates for transferred water will be determined. (p. 86/GAO Draft Report)

  DOD RESPONSE: CONCUR. Within 90 days from the time the Bureau establishes the water transfer policies referred to in the DOD response to Recommendation 1, the Secretary of the Army will require the Corps to establish guidelines for the approval of water transfers--outlining the steps required to satisfy operational, environmental, and contractual requirements and how rates, if any, for transferred water will be determined.

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MATTERS FOR CONGRESSIONAL CONSIDERATION

Now on p. 79.

See comment 10.

- **SUGGESTION 1**: The GAO suggested that, if the Congress decides to further encourage water transfers, it remove Federal legal impediments in reclamation law and other water development laws by giving the Corps of Engineers the authority to reallocate existing water storage space capacity in all projects for an purposes requested by a water storage purchaser, subject to Corps' approval, without requiring construction of reservoir storage capacity. (pp. 96-97/GAO Draft Report)

  DOD RESPONSE: Nonconcur. The DoD position is that the Department has sufficient authority under the Water Supply Act of 1958 to include M&I storage in Corps reservoirs without specific Congressional authorization without requiring construction or expansion of storage capacity.

- **SUGGESTION 2**: The GAO suggested that, if the Congress decides to further encourage water transfers, it remove Federal legal impediments in reclamation law and other water development laws by amending reclamation law specifically to allow transfers of water outside of authorized project ser-

Now on p. 79.

vice areas, to all beneficial uses, regardless of contract restrictions, with agency approval. (p. 96/GAO Draft Report)

DOD RESPONSE: No comment.

- **SUGGESTION 3**: The GAO suggested that, if the Congress decides to further encourage water transfers, it remove Federal legal impediments in reclamation law and other water development laws by abolishing appurtenancy requirements and reclamation law provisions that limit transfers by prohibiting reductions in irrigation efficiency--requiring no practicable alternative source of water and requiring the permission of existing water users in the project. (p.96/GAO Draft Report)

Now on p. 79.

DOD RESPONSE: NO COMMENT.

- **SUGGESTION 4**: The GAO suggested that, in coordination Federal policy with existing state law governing wager use, the Congress consider whether to (1) continue to rely on the States' procedures governing third-party impacts and beneficial use, (2) make consideration of the environmental a and community impacts of transfers part of the Federal review process and clearly indicate that conservation, transfer, and instream uses are beneficial uses of water provided from Federal facilities, or (3) encourage states to make further changes in their laws to meet desired goals. (p. 96-97/GAO Draft Report)

Now on pp. 79-80.

DOD RESPONSE: No comment.

- **SUGGESTION 5:** The GAO suggested that the Congress recognize that other options, such as increasing water rates, may also improve efficiency--but would affect Federal water users differently. (p. 97/GAO Draft Report)

Now on p. 79.

DOD RESPONSE: No comment.

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The following are GAO's comments on the Department of Defense's letter dated February 3, 1994.

GAO Comments

1. The Department of Defense is correct in stating that the term "water transfer," as used in our report, means the sale or resale of federally provided water in the 17 western states by nonfederal water users who hold water rights or water contracts. The report discusses the distinction between reallocations and water transfers by stating that reallocations involve the Corps' changes to the designated use of a portion of storage space in the reservoir from one purpose to another. In contrast, with water transfers, existing users of the Corps' project waters choose to sell their water to other users. The report also indicates that any transfer that does not affect a project's operations would not require a reallocation of storage space or a new contract with the Corps.

2. We have revised the report to include the clarification and to state explicitly that if transfers do not require a Corps contract, the Corps will not establish new rates.

3. We agree that the Bureau of Reclamation is the predominant federal agency with jurisdication over the sale of federally provided irrigation water in the 17 western states, including irrigation water stored in the Corps' reservoirs. Because of this, we agree that the Corps should consult with the Bureau during the development of water transfer policies.

4. We are aware that the Department of Defense disagrees with GAO's interpretation of the Water Supply Act. This disagreement was outlined in a previous GAO report entitled Water Resources: Corps Lacks Authority for Water Supply Contracts (GAO/RCED-91-151, Aug. 20, 1991).

5. See comment 1.

6. See comment 1.

7. See comment 2.

8. We agree that the Corps should consult with the Bureau during the development of of water transfer policies. However, as outlined in the report, the Corps has obligations in connection with the operation of its reservoirs that must be considered in approving transfers. While many transfer approval requirements may involve the Bureau of Reclamation as

the agency administering irrigation contracts, the requirements for reservoir operations are likely to require consideration predominantly by the Corps. Specifying these requirements would require little Bureau involvement. In addition, not all transfers of water will involve irrigation water. As indicated in the report, the Corps has received requests for reallocations of storage space not only from irrigation, but also from purposes such as flood control. Clear requirements for transferring water stored in the Corps' reservoirs that do not involve contracts with the Bureau can also be developed without the presence of a Bureau policy. Accordingly, we continue to believe that the Secretary of the Army should require the Corps to establish guidelines for the approval of water transfers.

9. See comment 8.

10. See comment 4.

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