RECLAMATION

Managing Water in the West

Water Marketing Activities within the Bureau of Reclamation

U.S. Department of the Interior
Bureau of Reclamation

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Mission Statements

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and Tribal communities, and supplies the energy to power our future.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Acronyms and Abbreviations $

af	acre-foot/feet
AFU	acre-feet units
AWTP	Accelerated Water Transfer Program
AZ	Arizona
BA	biological assessment
Banks	Harvey O. Banks Pumping Plant
BO	biological opinions
CALFED	California Bay-Delta Program
CAWCD	Central Arizona Water Conservation District
C-BT	Colorado-Big Thompson
cfs	cubic-feet-per-second
the Congress	U.S. Congress
Country	United States
CPOU	consolidated place of use
CRWDA	Colorado River Water Delivery Agreement
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVWD	Coachella Valley Water District
Delta	Sacramento-San Joaquin River Delta
DOI	Department of the Interior
DWR	California Department of Water Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EWA	Environmental Water Account
Fry-Ark	Frying Pan-Arkansas Project
FWS	Fish and Wildlife Service
GP	Great Plains Region (Reclamation)
IID	Imperial Irrigation District
ICS	intentionally created surplus
Jones	Jones Pumping Plant

LC	Lower Colorado Region (Reclamation)
Lower Basin	lower Colorado River Basin
MAF	million acre-feet
M&I	Municipal and Industrial
MP	Mid-Pacific Region (Reclamation)
MRG	Middle Rio Grande
MWD	Metropolitan Water District of Southern California
Nation	United States
NCWCD	Northern Colorado Water Conservancy District
NDRP	National Drought Resilience Partnership
NEPA	National Environmental Policy Act
NMISC	New Mexico Interstate Stream Commission
O&M	operation and maintenance
PEC	Program Economics, Revenues, and Contacts
P.L.	Public Law
PN	Pacific Northwest Region (Reclamation)
PVID	Palo Verde Irrigation District
QSA	Qualification Settlement Agreement
Reclamation	Bureau of Reclamation
the Secretary	Secretary of the Department of the Interior
SDCWA	San Diego County Water Authority
SE	System Efficiency
SJCP	San Juan-Chama Project
SNWA	Southern Nevada Water Authority
SOD	South of Delta
SWP	State Water Project
UC	Upper Colorado Region (Reclamation)
Upper Basin	upper Colorado River Basin
U.S.	United States
U.S.C.	U.S. Code
Warren Act	Warren Act of 1911
WWD	Westlands Water District

WTWG	Water Transfer Working Group
YDP	Yuma Desalting Plant
YRBWEP	Yakima River Basin Water Enhancement Project

Executive Summary

This report is prepared in response to a Presidential Memorandum signed on March 21, 2016, directing Federal agencies to build National capabilities for long-term drought resilience. This report is prepared to present activities relating to Goal 5: Market-based Approaches for Infrastructure and Efficiency.

For decades, water users throughout the 17 Western States have established a variety of institutional structures and approaches to address water needs particular to their location. In some cases, these types of institutions create market conditions designed to meet local needs, in the context of existing water infrastructure, local water supplies and demands, and environmental and other State and Federal legal frameworks.

Many past and on-going water market transactions involve Bureau of Reclamation (Reclamation) facilities and/or Reclamation contractors. This report highlights the ways Reclamation has partnered with local water districts across the West to enable such transactions, which collectively represent a tremendous amount of locally-led innovation. This report also illustrates how these transactions have created collaborations and programs that enable greater flexibility in the use of water resources and/or facilities to meet a broader array of needs. This is not a comprehensive inventory of Reclamation-related water transfers or other transactions, programs, or efforts.

These examples illustrate important trends in water resource management:

- Water transfers are an important component of water managers' portfolios and can assist in responding to short- and long-term hydrologic changes.

- Standardized guidelines/approaches have been helpful where the demand for water transfers is relatively high. This type of guidance, coupled with an annual buyer/seller meeting, can help parties involved in transfers better understand the process, timelines, and constraints.

- Existing authorities such as the Warren Act of 1911 and Section 14 of the 1939 Act have allowed Reclamation to facilitate transfers and/or enter into contracts with water users for the use of excess capacity in Federal facilities.

- Acquisitions of water for environmental purposes are an important tool for the Department of the Interior in meeting fish and wildlife management responsibilities.

Many Native American water rights settlements allow for the marketing of water. However, each settlement is unique and a comprehensive examination of Native American water rights settlements is beyond the scope of this report.

Reclamation supports the use of various water transfers and other market-based transactions to address water supply shortfalls. Statutory authority, State requirements, and procedures applicable to transfers can present challenges. To continue enabling locally led water market transactions in the West, Reclamation will explore the following areas for opportunities to address and remedy barriers or challenges:

1. Review Reclamation's internal water transfer approval processes and determine if there are opportunities for internal process improvements.

2. Identify and evaluate opportunities for increased efficiencies relating to programmatic National Environmental Policy Act compliance.

3. Improve the information Reclamation collects and provides on water transfers and markets.

4. Review water acquisition activities to develop best practices and consider establishing centralized sources of information and/or source of funding for water acquisitions.

Contents

I. Introduction

There is a growing need for drought resilience. To enable a more unified Federal response to this National challenge, President Obama established the National Drought Resilience Partnership (NDRP) in November 2013 as part of his Climate Action Plan. The NDRP is comprised of the United States (U.S.) Department of Agriculture, the National Oceanic and Atmospheric Administration, the Department of the Interior (DOI), the Assistant Secretary of the Army for Civil Works, the Federal Emergency Management Agency, the Environmental Protection Agency, and the U.S. Department of Energy.

On March 21, 2016, President Obama signed a Presidential Memorandum directing Federal agencies to build National capabilities for long-term drought resilience. The President tasked the NDRP to work collaboratively to deliver on a Federal action plan including six goals and 27 associated actions to promote drought resilience nationwide. The memorandum and the action plan elucidate the role of the NDRP in helping communities manage the impact of drought by linking information with drought preparedness strategies in critical sectors like agriculture, municipal water systems, tourism, and transportation. This report is prepared to present on activities relating to Goal 5: Market-based Approaches for Infrastructure and Efficiency. Specifically, this report highlights the role of the Bureau of Reclamation (Reclamation) in supporting water markets.

Reclamation is a bureau within the DOI, responsible for the management, development, and protection of water and related resources in an environmentally and economically sound manner in the interest of the American public. Established in 1902, Reclamation is best known for the numerous dams, powerplants, and canals it constructed. Reclamation is the largest wholesale water supplier and second largest producer of hydropower in the U.S. with operations and facilities in the 17 Western States. The most common benefits provided by its facilities are irrigation, municipal and industrial (M&I), power, flood control, recreation, and fish and wildlife. It is a contemporary water management agency with numerous programs, initiatives, and activities. Reclamation is geographically dispersed into five regions, named for the general river basin-area jurisdictions that they provide oversight of facilities and water resources.

- The Great Plains (GP) Region encompasses all or parts of nine States including Montana, North Dakota, South Dakota, Wyoming, Colorado, Nebraska, Kansas, Oklahoma, and Texas.

- The Lower Colorado (LC) Region encompasses southern Nevada, southern California, most of Arizona a small corner of southwest Utah, and a small section of west-central New Mexico.

- The Mid-Pacific (MP) Region covers the northern two-thirds of California, most of western Nevada, and part of southern Oregon.

- The Pacific Northwest (PN) Region encompasses the Columbia River Basin and includes the States of Idaho, Washington, and parts of Montana, Oregon, and Wyoming.

- The Upper Colorado (UC) Region encompasses Utah, New Mexico, western Colorado, northeastern Arizona, southwestern Wyoming, west Texas, and small portions of Nevada and Idaho.

Reclamation provides water, referred to as "project water," that is developed, diverted, stored, or delivered in accordance with the statutes authorizing the project and facilities. Any other water utilizing Reclamation facilities is characterized as non-project water. The hydrologic conditions, climatic variability, consumptive use within watersheds, physical location, geographic landscape, as well as particular aspects of State and local regulatory requirements and authorities create unique settings for operations of projects and decision-making between the five regions.

As early as 1988, the DOI developed a set of principles governing Reclamation's involvement in water transfers, hereinafter Principles (see Appendix A). The Principles recognized that water transfers could allow water to be used more efficiently to meet changing water demands and could also protect and enhance the Federal investment in existing facilities. The Principles enabled Reclamation to support innovation from local water users who saw benefit from new and more flexible arrangements for allocating water, consistent with project authorities, environmental requirements, and State law. Reclamation's role in water transfers over the past few decades reflects these Principles.

The efficient management and use of water resources is critical throughout the U.S. as parts of the nation continue to experience unprecedented droughts. Reclamation has worked with stakeholders to develop conservation initiatives that include locally driven water transfer activities. Reclamation recognizes that water transfers are an important element in water managers' tool kits and supports water transfer activities throughout the west.

Over the past 40 years, a vast number of water transactions have occurred in diverse institutional settings. Reclamation has had an integral role in these activities, including facilitating transfers of water amongst its stakeholders utilizing Federal facilities.

Across the west, Native American water rights settlements enacted into law by the U.S. Congress (Congress) often provide for the marketing of settlement water off the reservation through short- and long-term leases. The ability to lease settlement water from the reservation provides a stable revenue stream for a Tribe and a water source for

communities near an Indian reservation. Such leases of settlement water may also be referred to as water transfers with the understanding that the settlement water cannot be permanently alienated from a reservation under the Non-Intercourse Act, 25, U.S. Code (U.S.C.) § 177. Besides leasing, Native American water rights settlements may include efficiency improvements, exchanges of settlement water for other water, and effluent trading. In Montana, certain Native American water rights settlements authorize water marketing in compacts between the State and a Tribe. The water marketing provisions in such compacts specify the process that participating parties must follow.

Generally, Native American water rights settlements require settlement water be leased or exchanged within the State where the reservation is located, and in some cases, within specified ground water or river basins subject to State law. Certain settlements may be relatively restrictive and permit off reservation water marketing only in specified locations (e.g., settlement for the Shivwits Band of the Paiute Indian Tribe of Utah and the settlement of the Aamodt litigation for the New Mexico Pueblos of Nambe, Pojoaque, San Ildefonso, and Tesuque). Some settlements preserve the opportunity for a Tribe to litigate whether and to what extent a Tribe's settlement water may be marketed outside of the State where the Tribe's reservation is located or the geographic area where the water right was established on behalf of a Tribe.

Reclamation can identify Native American water rights settlements that include water supplies from Federal Reclamation projects. Reclamation's regional offices provide information on the extent that Tribes have marketed settlement water off reservation. Although the marketing of water pursuant to the Native American water rights settlement is an important component of western water supply management, each settlement is unique. A comprehensive examination of Native American water rights settlements is beyond the scope of this report.

This report will:

- Present examples of differing types of water transfers and other transactions involving Reclamation facilities for selected projects;
- Offer general observations about water transfers and other transactions along with Reclamation's role; and
- Provide a set of recommendations for Reclamation to further support local and regional water market development.

II. $ Background on Water Transfers and Other Transactions

In general, water markets are governance structures, processes, or recognized systems designed to facilitate movement of water between willing sellers to willing buyers on a temporary or permanent basis. Because water markets are based on water sources derived from Federal, State, or local water rights, and because such rights vary, the exact form and practice of water markets will also vary. In concept, allowing a market to allocate supplies achieves the most efficient distribution of a resource, subject to several theoretical conditions. Market approaches to water allocation have the potential to allow more efficient allocations of water resources in the arid west.

For the purposes of this report, the terms "water transaction," "water transfer," and "water exchange" mean a change in the place and/or purpose of water use that is voluntarily undertaken for the mutual benefit of the involved parties.[1] Transfers can be short- or long-term (including single season, long-term, split season, etc.). Transfers may also include purchasing a water right together with the appurtenant land.[2]

The general types of transactions described in this report include the following:

- **Water transfers.—**Transfers can occur for a variety of reasons and can be for short- or long-terms. Drought or other factors can be an impetus for water transfers. Transfers may also involve large volumes of water.

- **Transfers into and withdrawals from water banks.—"**Water banking" refers to water stored for use at a later time. During non-drought conditions, some formally organized water banks and "exchange pools" have developed on a more permanent basis.

There are many examples of situations where market-like institutions have developed.[3] Overall, WestWater Research, LLC, estimates the total annual volume of water transferred at about 1.5 to 2.5 million acre-feet (MAF) per year from 2006 through 2015, with the value of this transferred water ranging from a low of about $220 million in 2013 to a high of $794 million in 2015.[4] While these numbers are estimates, they are a signal that there is a considerable amount of market activity. Within this broad context, there is considerable variation in market size in terms of number and value of transfer.

III. Reclamation's Water Management Responsibilities

Water management is a complex overlay of Federal, State, and local laws. The Federal Government, through Reclamation, has a prominent role in managing water; however, Reclamation's activities must conform to State and/or Federal law, which governs water rights. Thus, water markets and transfers must comply with State water laws even when they use or intersect with Federal projects.[5]

Reclamation's primary role in western water is through the water development projects it has constructed and the contractual relationships put in place between Reclamation and project water users. Because a substantial portion of the storage and delivery of surface water in the Western U.S. relies on Reclamation constructed facilities, water transfers often involve water that is stored or delivered via facilities constructed (and sometimes operated) by Reclamation.

Reclamation's role can vary depending on the circumstances associated with the transfer. For instance, intra-district water transfers are frequent and may require little or no Reclamation involvement (though many of these districts receive project water from Reclamation facilities). However, in some situations Reclamation has a more direct role. For instance, Federal facilities may be used to store or convey non-project water, or a proposed transfer might affect other Reclamation contractors that are not direct participants in the transfer. Storage in Reclamation reservoirs may also be a necessary component of water banks. Additionally, Reclamation may be a direct purchaser of water, as is often the case, for environmental flows or water for wildlife purposes.

Reclamation has policies in place that define its role in facilitating water transfers and markets, and that provide methods for establishing a price for water converted from agricultural to M&I use. For example, Reclamation policy establishes the conditions and procedures for when project water is transferred to a new user, place, use, or converted to a new type of use (see Appendix B). The primary components of this policy include:

- Realigning of the irrigation and M&I water use categories;
- Defining the basic options and requirements for transfers and conversions of project water; and
- Re-emphasis of Reclamation's support for transfers and conversions.

IV. $Case Studies of Water Transfers Involving Reclamation

A. $ Introduction

Below we present information on transfers or other transactions where Reclamation projects play a facilitating and/or central role. This information is organized by types of transaction to illustrate some of the key features and challenges associated with water transfers or other transactions; it is not comprehensive, but covers the following types of water transactions:

- Water transfers;
- Water banks;
- Water acquisitions;
- Transactions that only involve the use of Federal storage or conveyance facilities; and
- Other innovative water efforts.

These categories illustrate the scope and magnitude of transfers involving Reclamation. The information provided is primarily data on volumes of water sold or leased. Price information is typically not available since the information is not required by Reclamation when reviewing a transfer proposal (though price data are available if Reclamation was the purchaser of the water, e.g., for wildlife refuges).[6]

B. $ Water Transfers to Address Supply and Demand Imbalances

Short-term transfers are typically a single year agreement for use of water often negotiated by a bidding process. Short-term transfers are often viewed as a source of water supply with higher risk (Howitt et al., 1999). Short-term transfers of water in California, for instance, often trade approximately 250,000 acre-feet (af) annually at prices that can exceed $1,000 per af (including costs associated with conveyance; as well as conveyance losses, district costs, and other costs). Other spot markets typically involve transfers of significantly smaller volumes at lower prices. The volumes and prices for water in markets for permanent sales (e.g., the market in Colorado-Big Thompson (C-BT) Project units) are often correlated with land markets, and can be quite high, exceeding $25,000 per af.[7]

1. ! *California Short-term Transfers*

Short-term transfer markets in the Central Valley of California are some of the most

developed in the western U.S and have been largely driven by supply and demand imbalances. In California, the Central Valley Project (CVP) and California State Water Project (SWP) infrastructure creates conditions conducive for a functioning water market, particularly for short-term transfer markets, because facilities are in place to allow water to move between locations and users. This ability to transfer water has proven very beneficial to California water users, especially in dry years.

Figure 1 shows the volume of water transferred in Reclamation's CVP. Water transfers generally fall into two categories: 1) transfers among CVP contractors; and 2) transfers between CVP and SWP contractors. Most transfers are short-term, lasting no more than one year. California also operated a Dry Year Purchasing Program in 2001, 2002, and 2003 to supplement water supplies to public agencies to offset water shortage conditions. This program facilitated short-term transfers of CVP and SWP water to urban and agricultural water users.

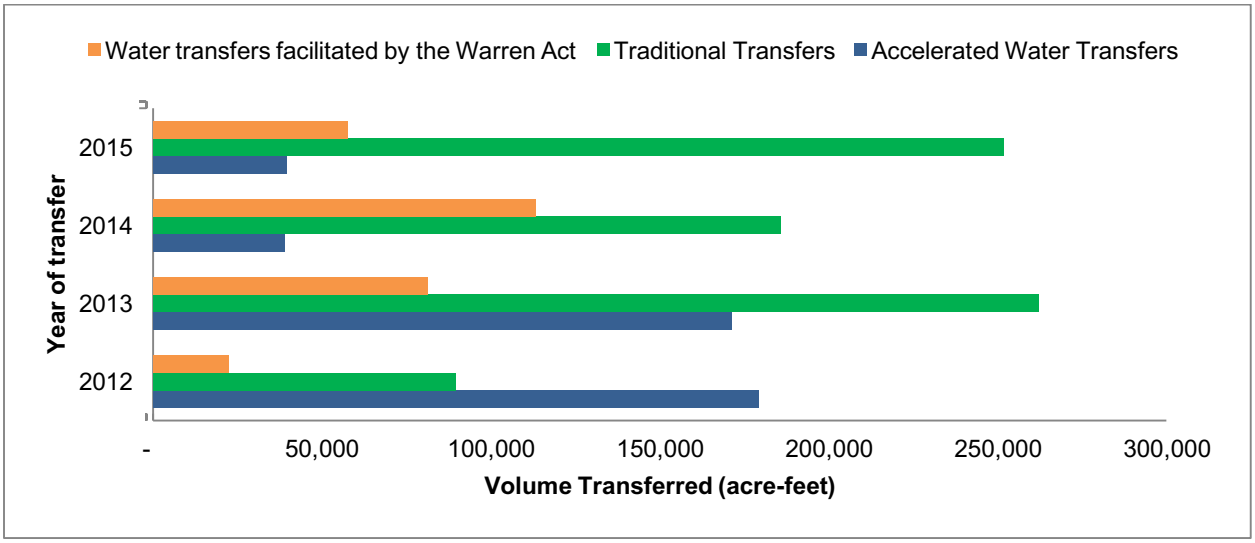

Figure 1.—Annual volume of water transferred via Reclamation CVP water transfer programs, 2012-2015. Source: Reclamation data.

Economic incentives and the presence of a vast network of water infrastructure help to facilitate water transfers in the Central Valley.[8] However, there are also a number of institutional factors and policies that enable transfers. For example, the 1992 Central Valley Project Improvement Act (title XXXIV, Public Law (P.L.) 102-575), authorized CVP water users to transfer their project water to other users in the State. This was the first Federal legislation, outside of legislation designed specifically to alleviate drought impacts, to allow Federal water users to transfer their contracted water outside of a contractor's boundaries for any State-defined beneficial use (GAO, 1994). In addition, Reclamation's MP Region and the California Department of Water Resources (DWR) publishes an annual "Technical Information for Preparing Water Transfer Proposals," that provides information on the steps required to transfer water, the timelines, and the

information requirements for water transfers that require conveyance through CVP or SWP facilities or otherwise require approval by Reclamation and DWR.[9]

In addition to these steps to facilitate transfers, the CVP and SWP were granted temporary consolidated place of use (CPOU) south of the Sacramento-San Joaquin River Delta (Delta) during several years beginning in 2010 through 2016. Under the CPOU, Reclamation and DWR requested a one-year modification to the CVP and SWP licenses and permits to temporarily change the authorized place of use of: (1) Reclamation's licenses and permits to include the SWP authorized place of use downstream of Harvey O. Banks Pumping Plant (Banks); and (2) DWR permits to include the CVP authorized place of use downstream of Jones Pumping Plant (Jones). The maximum total transfer quantity is specified and is based on the contractors for which the petition is submitted. The changes allow Reclamation and DWR to more effectively and efficiently utilize the operational flexibility of the combined SWP and CVP facilities and water supply south of Banks and Jones. The operational flexibility, in turn, helps reduce the impacts to water users south of the Delta caused by unavailability of adequate SWP and CVP water supplies. The requested changes facilitate the delivery of available CVP supplies south of the Delta and maximize the beneficial use of available supplies within areas experiencing critical water supply shortages. Approval of the petition does not increase the quantity or alter the timing of diversions from the Delta or the San Joaquin River. Reclamation has also completed several programmatic Environmental Impact Statement's (EIS) to facilitate water transaction activity within certain areas of the CVP over multi-year periods.[10]

Reclamation has also established an Accelerated Water Transfer Program (AWTP) to facilitate short-term transfers in the CVP. The National Environmental Policy Act (NEPA) compliance review process that allows Reclamation to evaluate the environmental impact of potential transfers under the AWTP lasts for a five-year term. This means that Reclamation must analyze each of the AWTP's three geographically defined areas for potential environmental impacts every five years rather than undertaking NEPA compliance every year. The AWTP also has defined a set of transfers eligible for the program.[11] About 179,000 af were transferred under the AWTP in 2012, declining to about 39,000 af in 2015 when less AWTP water was available to be transferred due to drought conditions and decreased allocations.

2. Colorado-Big Thompson Project

Water is frequently transferred on a seasonal basis from allotment contract holders of C-BT Project water to other water users within the boundaries of the Northern Colorado Water Conservancy District (NCWCD). Seasonal transfers of C-BT Project water and the associated rental market activities within the C-BT Project are made possible by a unique institutional parameter.

In accordance with the contractual documents between Reclamation and NCWCD, NCWCD is the contract owner of the C-BT Project water, having the perpetual right to the water yielded from Reclamation's C-BT Project. The NCWCD has implemented an

institutional and administrative structure that allows both the seasonal transfers and the transfer of allotment contracts to function within a market system. Between 1939 and 1955, the NCWCD issued allotment contracts totaling 310,000 af units (AFU) to water users within the NCWCD boundaries. Each year, each allottee receives 1/310,000 of the water declared by the NCWCD Board of Directors to be available from the C-BT Project in that year for each AFU owned by that allottee. These AFUs can be bought and sold on a willing seller/willing buyer basis with the approval of the NCWCD Board of Directors. Unlike many other water transfers that can require significant documentation and permitting, seasonal rentals or transfers require no more than a postcard to the NCWCD in order to shift the water to a different use or location. Sales of allotment contracts on a more permanent basis also are relatively straightforward.

Because the AFUs are homogenous, transfers across users, especially across sectors, can occur with minimal fees and required paperwork (Thompson 1993; Carey and Sunding 2001; Howe and Goemans 2003); transfers do not have to be adjudicated by the water court; they require only the approval of the NCWCD Board. Additionally, because the water supplied by the C-BT Project is a trans-basin diversion, the return flows resulting from the beneficial use of C-BT Project water belong to the NCWCD (a provision of the NCWCD contract with Reclamation) and may be used to extinction by the NCWCD under State law. As a result, there is no legal basis for an objection by downstream parties concerning either the seasonal transfers or the transfer of allotment contracts, greatly simplifying transfers of C-BT Project water within the boundaries of NCWCD. Finally, the presence of agricultural and municipal water users creates the market structure associated with transfers between users willing to pay very different prices for water.[12]

Between 2007 to 2015, about 140,000 af per year moved through the seasonal rental market, or about 60 percent of the water declared by NCWCD to be available to allottees each year from the C-BT Project. Figure 2 shows the seasonal and permanent transfers over 2007 to 2015. The number of permanent transfers varied over this period from about 40 transfers in both 2010 and 2011 to a high of about 80 transfers in 2013; the average number of seasonal rental transactions has been close to 600 per year over the 2007 to 2015 period.

Figure 2.— C-BT permanent and seasonal transfers, 2007-2015. Source: NCWCD data.

3. Yakima Basin

Except for some limited transfers within tributaries and downstream exchanges/transfers, water marketing would be severely limited in the Yakima Basin without Reclamation storage. Reclamation contracts and stores the State's trust water rights and facilitates exchanges by currently storing up to 1,000 af in the reservoir system. The storage of the former irrigation right, converted to a State trust right, during the irrigation season allows Reclamation to mitigate full year domestic and municipal use water.

Yakima Water Transfer Working Group

Reclamation is a participating member of the Water Transfer Work Group (WTWG), an informal, unofficial body composed of the major water interests in the Yakima Basin (Reclamation, State, Tribes, districts, and others) that reviews all water transfers in the basin and serves to inform the adjudication court of legal issues regarding proposed transfers. WTWG recommended transfers enjoy a smooth approval processes. In the future, the core functions of the WTWG could be incorporated into a larger basin wide water bank.

Sources: http://www.usbr.gov/pn/programs/yrbwep/phase2/watertransfers.pdf1; http://www.ecy.wa.gov/programs/wr/ywtwg/ywtwg.html, (Dept. of Ecology, State of Washington); and Bill Ferry, Reclamation s Yakima Basin Office (email correspondence: June 2 2016).

P.L. 103-434, the Yakima River Basin Water Enhancement Project (YRBWEP), authorized improvements to water deliveries by increasing both the reliability of irrigation supply and the efficient use of instream flows. The legislation specified a new operating regime, which enabled the Yakima River Basin Conservation Program to acquire water for instream flows and specified a new higher target instream flow level at

Sunnyside and Prosser Diversion Dams relative to the total water supply available in the YRBWEP. Alternatively, if possible, this water could be held in storage and used at other times and for other benefits at points in the basin below the storage facilities, i.e., spring outmigration pulse flows.

4. Transfers Involving Large Volumes of Water

Transfers also occur for large volumes of water. These transfers, which typically require lengthy negotiations between the parties, also commonly involve a change in the purpose and/or place of water use. One characteristic of these transfers is that the difference in the value of water to the two water users may be large, creating potentially significant gains from transfer.

Many of the transfers in Reclamation's LC Region are these types of negotiated transfers. Most notable are the conserved water transfer agreements between Imperial Irrigation District (IID) and Westlands Water District (WWD), IID and the San Diego County Water Authority (SDCWA), and IID and Coachella Valley Water District (CVWD), embodied in the State Qualification Settlement Agreement (QSA). Executed on October 10, 2003, the State QSA is an agreement among IID, CVWD, and Metropolitan Water District of Southern California (MWD) to quantify each party's share of California's apportionment of Colorado River water and to allow for transfers of Colorado River water among the parties. The State QSA is based on implementation of water conservation measures within IID, and on the transfer of conserved water to the other parties, including SDCWA, which is a member agency of MWD. The State QSA also provides the framework for other agreements that were executed concurrently among these and other California parties to implement several other conservation actions and the allocation of the conserved water. The State QSA water transfers have a term of up to 75 years, and provide an important mechanism to assist California's efforts to maintain its diversions of Colorado River water in normal years to its 4.4 MAF apportionment of Colorado River water.[13]

Interstate Banking

Under the authority of rules promulgated by DOI, Arizona has agreed to allow Nevada to lease groundwater stored in Arizona. In certain years Arizona would forego diverting Colorado River water. This water would then be available to Nevada. For details see: 43 CFR Part 414 Off stream Storage of Colorado River Water and Development and Release of Intentionally Created Unused Apportionment in the Lower Division ! States, November 1, 1999; Storage and Interstate Release Agreement Among SN WA, Colorado River Commission of Nevada, Arizona Water Banking Authority, and the U.S., December 18, 2002; and Storage and Interstate Release Agreement Among SNWA, Colorado River Commission of Nevada, The MWD, and the U.S., October 27, 2004.

One example of a water transfer made pursuant to the Federal QSA framework is the IID-MWD transfer referenced. In 1988, MWD and IID entered into the Agreement for the Implementation of a Water Conservation Program and Use of Conserved Water, as amended (Water Conservation Agreement). Under the Water Conservation Agreement, IID agreed to undertake measures to conserve a portion of the

Colorado River water to which IID is entitled under its water delivery contract with the Secretary and make this conserved water available to MWD. In exchange, MWD agreed to pay for the costs of the conservation measures. The conservation projects implemented by IID include regulation reservoirs, canal lining, 12-hour scheduling, and system automation, among other projects. Under a May 14, 2007, amendment, the amount of conserved water made available by IID under the Water Conservation Agreement is 105,000 af per year. In accordance with the 1989 Approval Agreement among IID, MWD, Palo Verde Irrigation District (PVID), and CVWD, as amended, CVWD may request up to 20,000 af per year of the water conserved by IID for MWD under the Water Conservation Agreement. The Water Conservation Agreement and other arrangements entered into by the MWD could be classified as "option" agreements, where MWD receives water in a given year only if predetermined hydrologic conditions are met.[14]

An additional example is a land fallowing, crop rotation, and water supply program between the PVID and MWD. The program which was initiated on January 1, 2005 and will be in effect through July 31, 2040, involves participating farmers (landowners) to fallow between 7 and 28 percent of the land in the Palo Verde Valley in any year at the request of MWD. The Palo Verde Valley has 91,400 acres of irrigable land. Under the MWD-PVID agreement, the maximum amount of land that may be fallowed in any one year is 28 percent or 25,947 acres. Individual farmers may fallow between 10 percent and 35 percent of their acreage in any year at MWD's request. The estimated amount of water conserved due to land fallowing may range from about 25,000 to 118,000 af per year. The conserved water is available for diversion by MWD on the Colorado River. Monetary compensation by MWD of participating farmers and PVID is made in 3 ways: (1) an up-front payment of $3,170 for each acre enrolled in the program for a total of $73.5 million, which roughly equates to the market value of the land in 2004; (2) annual payments exceeding $700 per acre of fallowed land in a specific year; and (3) annual payments to PVID for its program-related administrative costs.

C. Water Banks

Generally, the term "water bank" refers to an institution that allows water users to "deposit" water now, and make that water (or portion of it) available to the same user or another entity at a later time or different location. In situations where water banks facilitate transfers between users in a given year, they do have some similarity to short-term transfers. Water banks exist in many Western States and Reclamation facilities may be used and/or Reclamation contractors often participate in banking efforts (Clifford, Laundry, and Hayden, 2004). Water banks can facilitate transfers between multiple sellers and the buyers of water, by providing a mechanism for sellers to provide information about the quantity and price of water for rent or sale and buyers can articulate the quantity of water they wish to purchase. While there are significant differences in the way water banks operate across the Western States, water banks typically have the goal of facilitating the transfer of water from low to higher-valued uses by bringing buyers and sellers together.

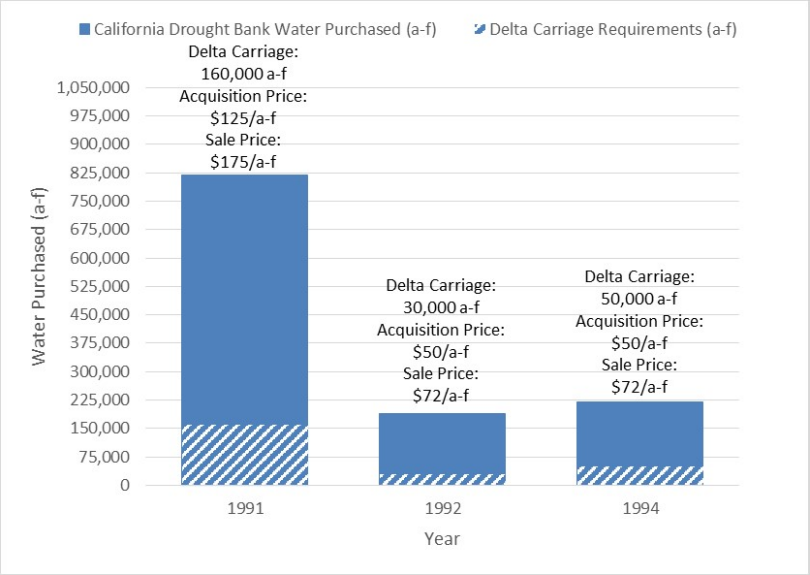

Figure 3.—California Drought Water Bank purchases.

For some water banks, the underlying objectives include increasing present and future reliability of water supplies in dry years, promoting water conservation, meeting environmental commitments and helping to comply with intrastate instream flow agreements. There is a wide variety of water bank operational roles, including the role of broker, acting as clearinghouse, and acting as a market-maker.

As an example, the use of water banks in California dates back to the 1970s. Following the severe drought of 1976 and the worsening situation that developed in 1977, the Congress enacted P. L. 96-18, which authorized the operation of Federal water banks during the drought. In this case, the Federal Water Bank acted as a broker and a clearinghouse through the Secretary, authorized to assist willing sellers in transferring water to willing irrigation-water buyers. The Federal Water Bank used $2.3 million to purchase 46,438 af both from the SWP and from Reclamation's CVP water contractors. Of the 46,438 af purchased by the Federal Water Bank, 42,544 af was sold to irrigators who wanted to protect long-term investments in permanent crops, such as orchards. The balance of 3,894 af represented deductions for return-flow losses and conveyance losses.

The average price for water paid by buyers was about $61 per af, with prices ranging from about $55 to about $142 per acre-foot. The high end of the price range reflected significant conveyance and pumping costs necessary to get the water to the buyer. In 2009, DWR and Reclamation collaborated to establish a water bank for transfers. DWR, as the lead agency, purchased approximately 74,000 af of water for $275 an af. This water was distributed throughout the CVP and SWP south of the Delta.

D. Water Acquisitions

Reclamation sometimes acquires water to meet programmatic and authorized purposes such as irrigation, M&I, conservation, or environmental requirements. Over the last 25 years, many western States have legally recognized the transfer of water to environmental purposes, but implementing laws and regulations vary across States.[15] Local water trusts and/or State agencies have an important role in environmental acquisitions.[16]

Some of these water acquisitions are necessary to meet the requirements of legal settlements or Federal legislation. These acquisitions have been a mix of short-term and permanent transfers and have relied on several different legal authorities. These transactions are important for a variety of reasons: they help DOI achieve its resource management objectives in a cost effective manner; they provide price information to potential market participants; they provide a means of compensating individuals for forgoing water deliveries; and they provide experience to market participants.

1. CVP Environmental Water Account (EWA) Acquisitions

The EWA was established in 2001 to provide water for the protection and recovery of endangered fish species (e.g., Chinook salmon – winter and spring runs, delta smelt, steelhead/rainbow trout). The EWA Project Agencies (DWR and Reclamation) agreed to curtail pumping at their respective pumping facilities in the Delta to protect endangered fish based on fish protective actions recommended by the EWA Management Agencies (U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service, and the California Department of Fish and Wildlife). The EWA would then reimburse south-of-delta SWP and CVP water contractors for all foregone water exports by transferring EWA water assets to the affected project. Until the end of the EWA, both the EWA Project and the Management Agencies worked cooperatively in making decisions about water purchases and fish actions, pursuant to the EWA Operating Principals Agreement.

From 2001 to 2007, the EWA's budget for water purchases from willing sellers was provided by both Reclamation and DWR to cover water losses for EWA purposes. Reclamation contributed funds to the EWA program for the first years pursuant to the Central Valley Project Improvement Act (CVPIA) 3406(b)(3) authority. In October 2004, the Congress passed specific authorization for the CALFED Bay-Delta Program including EWA. Federal funding of the EWA was periodically provided under this authorization until the program's expiration in December 2007. Over the 7-year life of the EWA program, over 1.3 MAF of water was purposed at an average cost under $150

per af. This allowed over 2 MAF of fishery protection actions over EWA's 7-year period. The program ended in 2007 due to lack of funding. At the same time Federal fishery agencies adopted new biological opinions (BO) for SWP and CVP operations. The new BOs changed the baseline from which the effects of the EWA were evaluated.

2. Newlands Project (Truckee-Carson Basin)

A very active water market operates in the Truckee-Carson Basin between irrigators, M&I users, and entities acquiring water for environmental purposes. In the Carson Division of the Newlands Project, water acquisitions for wetlands purposes have been made by the FWS, by the Nevada Department of Wildlife, and by nonprofit environmental entities. Processes to streamline transactions and reduce transaction costs have evolved since the early 1990s. The U.S. Navy has also been active in the Carson Division since 2006, partnering with Churchill County to acquire conservation easements for agricultural land near Fallon Naval Air Station, which requires water-righted farmland to remain in irrigation. In the Truckee Division of the Newlands Project, a private nonprofit, Great Basin Land and Water, has been active in water acquisitions and has acquired water for Pyramid Lake.

In 1990, under P.L. 101-618, the Congress added fish, wildlife, and recreation as project purposes, and authorized the FWS to acquire EWA Project water rights – individually owned by the water users – for the benefit of the Lahontan Valley wetlands, including the Stillwater National Wildlife Refuge. To date, the FWS, which handles acquisitions, has acquired approximately 36,222 af of project water through 101 permanent water purchases. In addition, acting as an agent for the Bureau of Indian Affairs, FWS completed 10 water right acquisitions with 1,757 af of project water for the Fallon Indian Reservation wetlands. Figure 4 below presents information on the water rights acquired between 1990 and 2015.

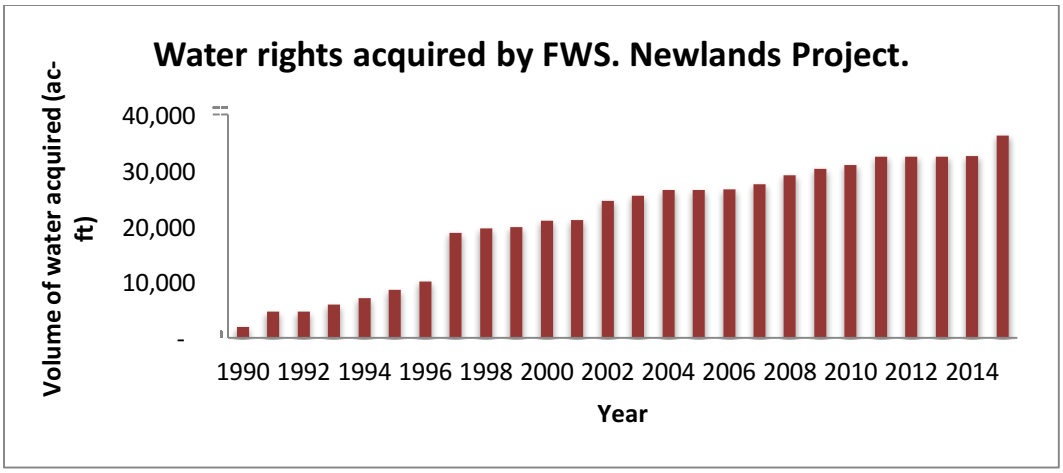

Figure 4.—Water rights acquired by the FWS, Newlands Project, 1990-2015. Source: U.S. FWS data.

3. *Rentals of Snake River Water*

Reclamation has leased water on an annual basis for environmental flow augmentation to help meet its responsibilities under the Endangered Species Act (ESA) from Idaho water banks and from the Shoshone-Bannock water bank. In addition, Reclamation has entered into some long-term leasing arrangements and purchases to acquire water for instream flows. Figure 5 depicts the annual amounts leased by Reclamation between 2005 and 2015.

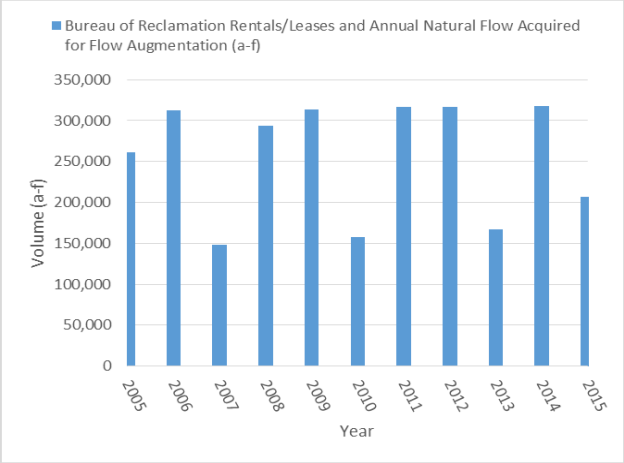

Figure 5.—Reclamation acquisitions of water for Snake River flow augmentation, 2005-2015.

4. *Middle Rio Grande*

Similarly, the Middle Rio Grande (MRG) Supplemental Water Program is a primary conservation measure of the San Juan-Chama Project (SJCP) and Middle Rio Grande Project to comply with Section 7 of the ESA. This is so that Reclamation's actions in the Middle Rio Grande River do not jeopardize the existence of the Rio Grande silvery minnow, the southwestern willow flycatcher, the yellow-billed cuckoo, or adversely modify their critical habitats. Since 2003, Reclamation has complied with reasonable and prudent alternatives and reasonable and prudent measures contained in the 2003 Biological Opinion (BO) issued by the FWS. The 2003 BO contained prescribed flow targets that required continuous river flow from November 16 through June 15, with flows of 100 cubic-feet-per-second (cfs) flow at the central gage in Albuquerque, New Mexico, and – depending on the type of water year – from June 16 to November 15, flows between 0 and 150 cfs below Isleta Diversion Dam.

To meet the 2003 BO flow targets, Reclamation leased water, issued storage waivers at Heron Reservoir, and pumped water from the low flow conveyance channel into the Rio Grande River – all of which are part of its Supplemental Water Program. However, reduced opportunities for acquisition of SJCP water supplies, which has been the mainstay for the Supplemental Water Program, together with warmer and drier forecasts, require the development of new water management tools.

Reclamation anticipates that the flow-related requirements in the new BO for the MRG River will be based on principles of adaptive management and will need to vary with hydrologic conditions from year to year. Reclamation also anticipates that non-federal agencies will bear a more proportional share of the responsibility to provide flows than they have in years past. Reclamation must continue to use currently available flexibilities and develop additional sources of water and water management tools.

5. Pecos River Water Acquisition Program

Reclamation and the New Mexico Interstate Stream Commission (NMISC) prepared an EIS in 2006 on the Carlsbad Project water operations and water supply conservation to address changes in the operation of Sumner Dam, located on the Pecos River, New Mexico. Implementation of a proposed water acquisition program in the Pecos River Basin is to conserve Carlsbad Project water supply. Reclamation's proposed Federal action is to operate the Carlsbad Project to divert water to storage, release project water from storage, acquire supplemental water, and perform additional conservation measures to facilitate ESA compliance, including the conservation of the Pecos bluntnose shiner, a federally threatened fish species.

The 2006 EIS analyzed effects of proposed operational changes on water supply, other affected resources, and options to mitigate for any adverse impacts were identified. The EIS also identifies potential effects to the Texas State line water deliveries and to the State of New Mexico's ability to comply with the Pecos River Compact and the U.S. Supreme Court amended decree in *Texas v. New Mexico*. The EIS includes reasonable options to avoid or minimize effects.

Reclamation submitted a new BA to the FWS in March 2016 that modifies the preferred alternative of the 2006 EIS. An environmental assessment (EA) is being prepared and will be tiered to the 2006 EIS to cover these changes. A BO from the FWS is expected by the end of 2016.

As part of the Pecos River Supplemental Water Conservation Measures in the new BA, Reclamation will continue to release water via Sumner Reservoir from the Fish Conservation Pool, the forbearance (Fort Sumner Irrigation District Contract Pool), and the additional defined exchange pool to augment flows and avoid or minimize intermittency. Reclamation will also continue to operate under the 25-year lease agreement with NMISC to fallow farmland and operate and maintain wells and the Vaughn pipeline, to deliver water to the Pecos River. Reclamation plans to continue to seek out sources of water and management strategies to augment flows and avoid or minimize intermittency. Reclamation currently is pursuing additional groundwater acquisitions and is working with NMISC and the U.S. Army Corps of Engineers to establish a 30,000 af fish and wildlife pool at Santa Rosa Reservoir.

E. Warren Act Transfers

The Warren Act of 1911 (Warren Act) authorizes Reclamation to enter into contracts to store or convey non-project water for irrigation purposes using Reclamation facilities, providing capacity is available and it does not impair project operations.[17] Specific projects (including the CVP) have been granted expansion of application of the Warren Act allowing contracting for excess capacity for non-agricultural purposes. In the CVP, transfers facilitated by the execution of a Warren Act contract represented 18 percent of the total quantity of water transferred from 2012 to 2015 (about 275,000 af of 1.5 MAF). The authority is applicable only to non-project water being conveyed for agricultural

purposes. Reclamation policy has established the maximum term of Warren Act contracts at 40 years. In the late 1980's, legislation was introduced in the Congress to amend the Warren Act to expand the authorized purposes to include M&I, domestic, or miscellaneous purposes, including fish and wildlife. However, this proposed legislation was not enacted.

Reclamation has also used the authority in Section 14 of the Reclamation Project Act of 1939 (Section 14) to contract for the storage and transfer of water that involves an exchange. This authority can be used for both irrigation and M&I. In addition to Section 14, Reclamation has used the authority of the 1920 Act, Sale of Water for Miscellaneous Purposes, which authorizes the Secretary to enter into contracts to supply water from any project irrigation system for purposes other than irrigation (i.e., M&I), upon such conditions of delivery, use, and payment as the Secretary deems proper. The ability to use Federal facilities to store or convey water as well as the ability to convert Project water from irrigation to M&I is often a key component of many water transactions. This flexibility is particularly useful in addressing needs during droughts because it can facilitate water use in different locations. For example, a special authority under P.L. 101-618 allows the use of Federal facilities without reimbursement to convey non-project water through the Newlands Project to Lahontan Valley wetlands. Currently, FWS is using this authority to convey treated effluent to wetlands under several Memorandums of Agreement with Reclamation, the U.S. Navy, and the city of Fallow.

A number of transfers of non-project water involve the use of CVP facilities and these transfers have generally relied on the authority of the Warren Act, the 1939 Reclamation Projects Act, or the 1920 Act. In general, the charges associated with these contracts have been based on the CVP cost-of-service rate (including construction and operation and maintenance (O&M) costs). In the CVP, to facilitate the transfer of non-project water depends on the complexity of the transfer, whether the transfer is covered by an existing EA, or if it must undergo a new environmental review. Other factors that impact the processing time of CVP-related contracts include changes to the water right (i.e., purpose of use, place of diversion).[18]

In Reclamation's GP Region, there have been a number of Warren Act or 1939 Reclamation Projects Act contracts. These contracts are associated with the C-BT Project, the Fryingpan-Arkansas Project, the Kendrick Project, and others. These contracts are generally long-term contracts (e.g., 40 years), involve payments that have been negotiated with water users, and include charges based on market rates. Market rate has been defined by a cost-of-service rate or a rate a willing buyer and a willing seller mutually agreed upon. Many of these contracts provide a crediting mechanism that allows a portion of the excess capacity charge to be used for future major rehabilitation and replacements on Reclamation projects.

F. Other Innovative Strategies

1. Colorado River Pilot System Conservation Program

In 2014, Reclamation, the Colorado River Basin States, and Colorado River water entitlement holders explored ideas on how to mitigate the impacts of the ongoing drought in the Colorado River Basin. On July 30, 2014, Reclamation signed an agreement with the CAWCD, MWD, SNWA, and Denver Water (Colorado) for a Pilot Program for funding the creation of Colorado River System water through the Voluntary Water Conservation and Reductions in Use Funding Agreement, as amended. The funding agreement is effective from July 30, 2014, through the expiration date of the last Pilot Program project implementation agreement. The purpose of the funding agreement is to (1) conserve Colorado River water in Lakes Powell and Mead to benefit the Colorado River System, (2) to test if voluntary measurable reductions in consumptive use of Colorado River water are a sufficiently feasible, cost-effective, and robust method to partially mitigate the impacts of salinity and long-term drought on the Colorado River System and (3) to manage water elevations in Lakes Powell and Mead above critically low elevations. If the Pilot Program is successful, it could become part of a broader suite of future drought mitigation programs. The funding agreement provides a process for joint funding, selection, and implementation of Pilot Program projects and for verification and accounting and/or reporting of Pilot Program water conservation. Under P.L. 113-235, the Secretary is required to submit to the Congress, no later than September 30, 2018, a report that evaluates the effectiveness of the Pilot Program.

Under the funding agreement, Federal and non-federal funding partners contributed $11 million ($3 million from Reclamation and $2 million each from the non-federal funding partners). The funding agreement allocated a minimum of $2.75 million for conservation projects in the upper Colorado River Basin (Upper Basin) and up to $8.25 million in the lower Colorado River Basin (Lower Basin).

In the Lower Basin, the projects implemented in the initial phase of the Pilot Program will collectively conserve approximately 63,000 af of water and utilized the initial $8.25 million of funding. Approximately 80 percent of the 63,000 af of water conservation is already in Lake Mead or will be by the end of calendar year 2016. The remaining amount of water will be conserved and stored in Lake Mead in later years. A second phase of the Pilot Program was initiated in 2016, with $5.8 million of additional Federal and non-federal funding and four new projects and expansion of a Phase 1 project will be implemented before the end of 2016. The four new projects, plus expansion of a Phase 1 project, are expected to conserve more than 35,000 af in Lake Mead. Phase 1 and Phase 2 Pilot Program projects in the Lower Basin are expected to conserve 97,984 af in Lake Mead by 2021, with an average cost paid to the Pilot Program participant of $146 per af.

2. Lower Basin Intentionally Created Surplus (ICS) Program

In 2006, Reclamation entered into letters of agreements with IID and MWD to implement a demonstration program for the development of ICS. In the demonstration program, ICS

refers to a quantity of surplus water that the Secretary may make available for release under Article II (B)(2) of the Consolidated Decree of the U.S. Supreme Court in *Arizona v. California* (Consolidated Decree). The demonstration program covered calendar years 2006 and 2007 and required that ICS be created through extraordinary conservation measures described below.

On December 13, 2007, the Secretary implemented the ICS Program via an interim program (Interim Guidelines) through December 31, 2025, to gain valuable experience operating Lakes Powell and Mead under modified operations and perhaps improve the basis for making future operational decisions during the interim period and/or thereafter. The Interim Guidelines provided for the development of ICS in Lake Mead from conserved Colorado River System and nonsystem (non-Colorado River System) water and for the delivery of ICS pursuant to applicable Federal law(s) to encourage water conservation actions and increase the flexibility of meeting water use demand from Lake Mead, particularly under drought and low reservoir conditions. The Interim Guidelines provide for the creation, verification, accounting, and any necessary forbearance and delivery agreements required to create and deliver ICS. ICS may be created through a variety of conservation methodologies, including system efficiency (SE), extraordinary conservation, tributary conservation, and the importation of non-system water. The Interim Guidelines also provide for limitations regarding the maximum quantities of ICS that may be created during any year, delivered in a year, and accumulated in a water user's ICS account. For tributary conservation, imported, and extraordinary conservation, at the time the ICS is created, 5 percent of the total amount created is dedicated to the Colorado River System on a one-time basis to benefit the system and enhance the water in storage in Lake Mead to meet future needs and to offset the effects of drought.

The largest category of ICS, in terms of the volume of ICS credited to water users to-date is SE ICS. The SE ICS program allows a water user to make capital contributions to the Secretary for use in projects designed to achieve system efficiencies that save water that would otherwise be lost from the Colorado River in the U.S. Two SE ICS projects have been implemented under the Interim Guidelines: (1) the construction of Brock Reservoir and (2) the Yuma Desalting Plant (YDP) pilot run.

Brock Reservoir.—Brock Reservoir (originally known as the Drop 2 Storage Reservoir Project) is located in Imperial County, California, just north of the Drop 2 Powerplant on the All-American Canal. The purpose of Brock Reservoir is to provide additional storage capacity to reduce non-storable flows on the Colorado River below Parker Dam (between Arizona and California). Under the funding agreement for Brock Reservoir, three participating water entities, SNWA, CAWCD, and MWD provided funding to construct the reservoir. In exchange, each entity was provided a proportionate share of the available ICS. SNWA has been credited with 400,000 af of ICS, CAWCD with 100,000 aft of ICS, and MWD with 100,000 af of ICS. The construction, construction management, and mitigation costs for Brock Reservoir were $172 million. The first 15 years of operation, maintenance, and replacement costs are estimated to be $7.4 million.

Based on historical data, Brock Reservoir is estimated to conserve, on average, approximately 70,000 af of water annually that would otherwise be non-storable and would flow to Mexico in excess of obligations pursuant to the 1944 Mexican Water Treaty. Over the estimated life of Brock Reservoir (50-yr), the estimated amount of water projected to be conserved is 3,500,000 af.

YPD Pilot Run.—Another example of an SE ICS project implemented under the Interim Guidelines is the YDP Pilot Run, which was conducted from May 2010 through March 2011. Under the funding agreement for the YDP Pilot Run, SNWA, CAWCD, and MWD each provided a capital contribution in exchange for a proportionate share of the ICS credits generated from the project. Reclamation conducted the YDP Pilot Run to collect performance and cost data, to test changes to the YDP, which were implemented while the YDP was being maintained, and to determine if any additional corrective actions to plant design or equipment would be necessary for potential long-term operation of the YDP. The YDP operated continuously for 328 days. YDP performance was high and no major equipment problems occurred. The Pilot Run was completed ahead of schedule and under budget. The cost of the Pilot Run was $15.97 million (31 percent less than expected) including preparation for the Pilot Run, operations and maintenance of the YDP during the Pilot Run, and returning the YDP to pre-Pilot Run conditions once operations were concluded. Labor and other input costs were less expensive than expected and preparations and operations were less challenging than anticipated. The Pilot Run resulted in a water conservation benefit of 30,496 af. The conserved water was delivered to Mexico to meet the U.S. obligation under the 1944 treaty with Mexico, resulting in an equivalent amount of Colorado River water being retained in Lake Mead.

G. Observations from the Case Examples

The material presented in this section supplements the case examples and presents some general observations related to water transactions and to Reclamation's role in facilitating transfers.

- Water transfers involving Reclamation facilities are occurring in a wide variety of locations and institutional settings. The scope and magnitude of transfer activity varies considerably. Reclamation's role in transfers is supportive of the local/regional interest in water transactions. The primary drivers of the activity vary, but ultimately are associated with water supply shortages, the high cost or difficulty of developing new supplies, and the differences in value between alternative water uses.

- Water transfers are an important component of water managers' portfolios and can assist in responding to short- and long-term hydrologic changes. When existing supplies are fully appropriated or when shortages exist, interest in water transfers is stimulated. The relatively high cost of developing new supplies can result in greater interest in transfers. Other factors that can stimulate interest in transfers include urban growth, environmental demands, Native American water

rights claims, and high value, permanent crops. Transfers of water to address environmental and Tribal needs often have been preceded by decades of litigation.

- Transaction costs are incurred in searching for buyers/sellers, ascertaining the characteristics of water commodities, negotiating price and other terms of transfer, and obtaining approval for the proposed change in point of diversion, place, and/or purpose of use. Transferors incur transaction costs as they seek to obtain State (and possibly Reclamation) approval to transfer water to a new place and purpose of use

- In concept, lower transaction costs will enable more transfer activity because lower transaction costs reduce one of the barriers associated with water transfers. In established water markets (including water banks), a larger number of water sales and leases are made possible because little effort is required to complete a transaction compared to an isolated, negotiated transaction. Because of the relative ease of entering an established, organized market, it is not uncommon for the transfers to involve small amounts of water and relatively small differences in the value of water to buyers and sellers. However, when an established market does not exist, entities wishing to transfer water are likely to incur comparatively larger transaction costs. In any market setting, the magnitude of these costs can affect both the number of transfers occurring during any time period and the size of the individual transfers.

- Reclamation can facilitate transfers in locally-led water markets by helping to minimize the transaction costs associated with activities within its control, i.e. making information generated or compiled by Reclamation available, including information related to the approval process required, NEPA compliance, and potential fees or charges.

- Contracts between Reclamation and water users play an important role in determining how and where water supplied by Reclamation can be transferred. Elements in those contracts provide the terms and conditions relating to the use of project water.

- Responding to drought conditions can require Reclamation to undertake actions in a relatively short time frame. These actions can include, for example, entering into or amending contracts for the use of excess capacity in Reclamation's facilities and completing NEPA compliance.

- In areas where there is a significant amount of water transfer activity including acquisitions for environmental purposes, such as in the Central Valley of California, Federal and State water managers work closely together. Collaborations between State and local water managers can ultimately result in lower transaction costs, which can stimulate additional transfers.

- The amount of information on water transfer activity tracked and published by Reclamation varies. Information is typically available on water transactions that

involve water acquired by the Federal Government for environmental purposes (e.g., in-stream flows), where both price and quantity are recorded.

- Standardized guidelines/approaches have been helpful in situations where the demand for water transactions is relatively high. State and Federal water managers in California have developed detailed guidance on the mechanics of CVP and SWP water transactions. This type of guidance, coupled with an annual buyer/seller meeting, helps parties involved in transfers better understand the process, timelines, and constraints.

- Existing authorities such as the Warren Act and the 1939 Act have allowed Reclamation to facilitate transfers and/or enter into contracts with water users for the use of excess capacity in Federal facilities. There are some differences in how Reclamation regions have implemented some of these authorities, such as establishing the charges for using excess capacity in Federal facilities under the Warren Act.

- Acquisitions of water for environmental purposes is an important tool that can assist DOI in meeting fish and wildlife management responsibilities

V. Recommendations for Facilitating Water Transfers

Reclamation can more actively promote the use of water transfers to address water supply shortfalls. Reclamation and water users recognize that legislation, procedures, and requirements applicable to transfers can present unique challenges. Reclamation will explore the following areas for opportunities to address and remedy barriers or challenges to water transfers.

1. **Review Reclamation's internal water transfer approval processes and determine if there are opportunities for internal process improvements.**

    - Identify and evaluate challenges to water transfers and develop potential solutions.

    - Explore opportunity for legislative authority similar to CVPIA for other projects to facilitate transfers.

2. **Identify and evaluate opportunities for increased efficiencies relating to environmental compliance (i.e., NEPA, ESA, Clean Water Act).**

    - Consider the level of environmental compliance documentation required for transfers and explore developing more streamlined approaches. This includes reviewing the extent to which categorical exclusions could be established, including identifying where there may be an opportunity and supporting documentation for categorical exclusions relating to transfers.

    - Consider whether transfers could be facilitated by identifying locations where joint places/types of use between Reclamation projects and projects operated by non-federal entities could be established.

    - Consider establishing procedures that would expedite transfers that are within a basin or subbasin; and whether transfers would be facilitated by developing a set of best management practices to facilitate water transfers.

    - Identify potential opportunities for efficiencies in EA and EIS, if categorical exclusion is not applicable.

3. **Improve the information Reclamation provides on water transfers and markets by exploring opportunities for centralized information on water transfers involving Reclamation.**

    - Research and identify options for creating a centralized source of information on water transfers associated with Reclamation facilities through internal and/or external sources.

- Explore opportunities to make contracting and repayment information more readily available and usable to the public.

4. **Evaluate ongoing water acquisition activities in terms of cost effectiveness and ability to meet purposes and objectives.**

    - Review the existing water acquisition efforts and develop a set of lessons learned and best practices.

    - Consider establishing a centralized source of information on Reclamation-wide water acquisition activities.

    - Explore the opportunity to establish a centralized source of funding in Reclamation for environmental water acquisitions.

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APPENDIX A $

DOI 1988 VOLUNTARY $
WATER TRANSFER PRINCIPLES $

DOI 1988 Voluntary Water Transfer Principles

DOI: Principles Governing Voluntary Water Transactions

December 16, 1988

Transactions that involve water rights and supplies are occurring pursuant to State law with increasing frequency in the Nation, particularly in the Western United States. Such transactions include direct sale of water rights; lease of water rights; dry-year options on water rights; sale of land with associated water rights; and conservation investments with subsequent assignment of conserved water. The Federal Government, as owner of a significant portion of the Nation's water storage and conveyance facilities, can assist State, Tribal, and local authorities in meeting local or regional water needs by improving or facilitating the improvement of management practices with respect to existing water supplies. Exchanges in type, location or priority of use that are accomplished to State law can allow water to be used more efficiently to meet changing water demands, and can also protect and enhance the Federal investment in existing facilities. In addition, water exchanges can serve to improve local and Indian reservation economics.

For the purpose of this statement of principles, all proposed transactions must be between willing parties to the transaction and must be in accordance with applicable State and Federal law….

Primary in water allocation and management decisions rests principally with the States….

The Department of the Interior (DOI) will become involved in facilitating a proposed voluntary water transaction only when it can be accomplished without diminution of service to those parties otherwise being served by such Federal resources.

DOI will participate in or approve transactions when there are no adverse third-party consequences, or when such third-party consequences will be heard and adjudicated in appropriate State forums, or when such consequences will be mitigated to the satisfaction of the affected parties...

DOI's role will be to facilitate transactions that are in accordance with applicable State and Federal law and proposed by others.

The fact that the transaction may involve the use of water supplies developed by Federal water resource projects shall not be considered during evaluation of a proposed transaction. One of DOI's objectives will be to ensure that the Federal Government is in an acceptable financial, operational, and contractual position following accomplishment of a transaction under this policy. Unless required explicitly by existing law, contracts, or regulations, DOI will refrain from

burdening the transaction with additional costs, fees or charges, except for those costs actually incurred by DOI in performance of its functions in a particular transaction.

DOI will consider, in cooperation with appropriate State, Tribal, and local authorities, necessary measures that may be required to mitigate any adverse environmental effects that may arise as a result of the proposed transaction.

APPENDIX B $

SUMMARY OF RECLAMATION WATER TRANSFERS POLICIES $

Table B-1.—Summary of Reclamation Water Transfers Policies

Reclamation Manual Policy	Subject(s)	Scope/Function
Policy: PEC P05 http://www.usbr.gov/recman/pec/pec-p05.pdf	Water-Related Contracts – General Principles and Requirements	To state basic principles and general policies for the Bureau of Reclamation's water-related contracting program, for the benefit of promoting clarity and consistency in the program's implementation.
Directive & Standard: PEC 05-01 http://www.usbr.gov/recman/pec/pec05-01.pdf	Water Rates and Pricing	To set forth general requirements and options for establishing contract rates for irrigation, municipal, industrial, and miscellaneous uses of project water under Reclamation law. The benefit of this Directive and Standard is that it promotes consistency in the application of generally applicable rate setting requirements for water-related contracts.
Directive & Standard: PEC 07-01 http://www.usbr.gov/recman/pec/pec07-01.pdf	Collection of Costs Associated With the Administration of Water-Related Contracting Activities	To provide requirements for the implementation of an equitable fee structure to collect O&M costs for water-related contracting activities. The benefit of this Directive and Standard is consistent application of these requirements by Bureau of Reclamation offices and personnel.
Policy: PEC P09 http://www.usbr.gov/recman/pec/pec-p09.pdf	Transfers and Conversions of Project Water	This Policy establishes the conditions and procedures to be followed when project water is transferred to a new user or place of use or converted to a new type of use. The benefits of this Policy are that it helps the Bureau of Reclamation address complex water management issues while ensuring that water deliveries are made consistent with applicable state and Federal law and are conducted in an environmentally responsible and cost-efficient manner.
Directive & Standards: PEC 09-01 http://www.usbr.gov/recman/pec/pec09-01.pdf	Conversions of Project Water from Irrigation Use to M&IUse	To set forth Bureau of Reclamation water-related contracting requirements for formalizing conversions of project water from irrigation use to M&I use, for the benefits of facilitating authorized conversions and ensuring that water deliveries are consistent with applicable State and Federal law.

Endnotes

1 MacDonnell (1990) and Lund et al., (1992) define water transfers as: "the voluntary permanent or temporary change in existing purpose and/or place of use of water under an established legal right or entitlement."

2 When Reclamation is entering into a contract with an entity that has purchased a water right associated with water delivered via Reclamation facilities, this might not be considered a "transfer," but rather an "assignment." Reclamation would also define "transfers" only in the context of "project water." Reclamation facilities can also have excess capacity (defined as diversion, storage, conveyance, or pumping capacity) which is excess to what is needed to achieve a Reclamation project's authorized purposes. Water transfers involving delivery or exchange of "non-project water" that require the use of Federal facilities are generally authorized under the Warren Act or Section 14 of the 1939 Act.

3 An "ideal" market could be defined as a market where: there are many buyers and sellers; buyers and sellers have perfect information; property rights are non-attenuated; robust enforcement and monitoring mechanisms exist; and market participants have the ability to transfer rights inexpensively and reliably without any policy constraints other than environmental requirements.

4 WestWater Research, March 26, 2015. The 2015 Water Market Outlook: Performance, Growth, and Investment Trends in the Water Rights Sector. For reference, California's annual allocation of water from the Colorado River is 4.4 MAF.

5 In general, the 17 Western States rely on the "prior appropriation" system of water rights for allocation and management of much or all of their surface water, and also recognize the ability to sever water rights from the underlying land in some circumstances. The ability to sever water from land permanently, or temporarily, is one of the key conditions water transfers. However, other considerations are also important. These can include: the extent to which these factors are important typically varies from State to State.

6 Where price data is included in this report, the prices have not been adjusted for inflation.

7 "Water is the New Gold as Farm Goes on the Market," *Denver Post*, July 17, 2016.

8 Urban water users and irrigators growing perennial fruit and nut crops (e.g., almonds) are typically willing to pay relatively high prices for water, which

drive transfers during low water years. The CVP and the SWP infrastructure allow water to be stored and conveyed across significant distances.

9 The approval criterion is chiefly associated with the avoidance of injury to other legal users of water, through the determination of whether the water proposed for transfer is transferable. This determination, frequently referred to as a "new water or real water determination," is the net addition of water to the downstream system that would not be available but for the transfer. The technical information document describes the information necessary for water transfers based on crop idling or shifting, groundwater substitution, and reservoir reoperation. Only that portion of the proposed transfer that is determined to represent new (sometimes referred to as "real water") water to the system is transferrable. http://www.water.ca.gov/watertransfers/docs/2016_Water_Transfer_White_Paper.pdf.

10 The Final EIS/ Environmental Impact Report on CVP water transfers to contractors south of the EWA Delta and in the San Francisco Bay area from CVP and non-CVP sources from north of the Delta was issued in 2015. Water transfers occur through various methods such as groundwater substitution, cropland idling, reservoir release, and conservation, and would include individual and multi-year transfers from 2015 through 2024. The document is available at: http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=18361.

11 (1) Sacramento Valley; (2) Friant Division contractors, (3) South of Delta (SOD) CVP contractors, including those in the Delta Division, San Felipe Division and San Luis Unit. The SOD AWTP also allows Cross Valley contractors to transfer to SOD contractors, and the Friant AWTP allows Friant Division contractors to transfer to Cross Valley contractors.

12 The Frying Pan-Arkansas Project (Fry-Ark) presents an interesting comparison to the C-BT project. The Fry-Ark project was initiated in the 1960s to supplement the highly variable native supplies in the Arkansas basin. This supplemental water is administered by the Southeastern Colorado Water Conservancy District, in many ways the counterpart of the NCWCD. The major difference between the two districts, however, is that the Fry-Ark water is allocated annually by an elected committee and is not subject to trade or sale.

13 In California, there is an established priority system for use of California's apportionment to Colorado River water. The normal operation of this priority system allows water conserved by a priority three entitlement holder, such as IID, to, with the consent of any entitlement holder, move down the priority system to MWD, which holds a fourth and fifth priority entitlement.

14 The 1988 IID-MWD agreement was amended on October 10, 2003; among other things, this amendment extended the term of the original agreement to align the end date with the Quantification Settlement agreement. On May 14, 2007, the agreement was further amended to, among other things, fix the annual transfer rate to 105,000 af annually (less adjustments resulting from operation of their Tailwater Return Systems). The IID-SDCWA has also been amended. Section 4 of the 1998 IID/SDCWA Transfer Agreement pertains to the term of the agreement, with the term established at 45 years, with an option to extend for an additional 30 years (however San Diego may terminate at the end of Year 35 if certain conditions apply).

15 Some States, such as Washington and Oregon, have had significant numbers of these types of transfers; other States, such as Wyoming, Arizona, and New Mexico have had relatively few (or none)Beginning in the late 1980s, State legislatures enacted laws that allowed existing appropriative rights to be transferred or dedicated for purposes of enhancing wildlife habitat and recreation. This meant that water previously diverted could be left instream and would benefit from the legal protections afforded such rights, including the seniority date and protection from junior appropriators. State laws vary in terms of the limits they place on environmental transfers, the scope of permissible transfers, the process for State approval of different transfers, and other issues (for additional details see: http://waterinthewest.stanford.edu/sites/default/files/WITW-WaterRightsLawReview-2015-FINAL.pdf).

16 Private entities have also acquired water for environmental purposes, especially in the Pacific Northwest. It is likely that many of these transfers involved Reclamation facilities or water supplied via Reclamation facilities.

17 The Warren Act of February 21, 1911 (36 Stat. 925, 926, 43 U.S.C., Sections 523, 524

18 Any transfer of non-project water requiring conveyance through Project facilities will require a “conveyance agreement” or a “letter agreement” with the transfer proponent, the buyer, and either DWR or Reclamation. Transfer proponents who provide the technical information requested in this document will help Reclamation and DWR review transfer proposals and develop their respective “conveyance contracts” or “letters of agreement.” Reclamation and DWR will review each water transfer proposal using the information provided by the transfer proponents and other available information including Reclamation’s and the San Luis and Delta-Mendota Water Authority’s Long-Term Water Transfers Final Environmental Impact Statement/Environmental Impact Report, as applicable.