

WATER SUPPLY SURVEY

DESCRIPTION OF WATER SUPPLIES AND POTENTIAL ACQUISITION ISSUES

PREPARED FOR THE ARIZONA WATER BANKING AUTHORITY AND THE CENTRAL ARIZONA PROJECT

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TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
LIST OF TABLES.....	3
LIST OF FIGURES	3
CHART.....	3
LIST OF APPENDICES.....	4
CHAPTER I - INTRODUCTION	5
AGENCY OBJECTIVES	5
Arizona Water Banking Authority Objectives.....	5
Interstate Water Banking Agreement.....	5
Indian Water Rights Settlements	6
Central Arizona Groundwater Replenishment District (CAGRD) Objective.....	7
Other CAP Objectives.....	8
CONDISERATIONS FOR THE MAGNITUDE AND TIMING OF WATER SUPPLY ACQUISITIONS.....	8
LIST OF POTENTIAL WATER SUPPLIES THAT MEET THE OBJECTIVES	10
ACQUISITION ISSUES	10
Issues That Apply to All Water Supplies.....	11
Availability of Willing Sellers	11
Water Supply Reliability.....	11
AWBA/CAP Authorities	11
Acquisition Costs	11
Issues - Non-Indian Colorado River Contracts.....	12
Legal Considerations	12
Third Party and Environmental Considerations.....	12
Issues - Mainstream Decreed Indian Entitlements.....	12
Legal Considerations	12
Third Party and Environmental Considerations.....	12
Issues - CAP Indian Communities.....	13
Legal Considerations	13
Third Party and Environmental Considerations.....	13
Issues - Yuma Area Groundwater Transportation	13
Legal Considerations	13
Third Party and Environmental Considerations.....	13
Issues - Other Interbasin Groundwater Transportations	13
Legal Considerations	13
Third Party and Environmental Considerations.....	13
Issues - Effluent within AMAs	13
Legal Considerations	13
Third Party and Environmental Impacts.....	14
Issues - Poor Quality Groundwater.....	14
Legal Considerations	14
Third Party and Environmental Impacts.....	14
Issues - Ocean Desalinization	14
CHAPTER II – DESCRIPTION OF WATER SUPPLIES	15

Introduction.....	15
Colorado River Water Contracts.....	15
Contractual Considerations for Colorado River Water.....	15
Colorado River Contracts - Priorities	16
Priority 1 and 2 Rights – Federal Reserved Rights.....	16
Priority 1 Rights – Non-federal PPRs.....	18
Priority 3 Entitlements	18
Priority 4 Entitlements	19
Priority 5 Entitlements	20
Priority 6 Entitlements	21
CAP Tribal Water Rights.....	21
Transfers from the Yuma Groundwater Basin.....	24
Groundwater Importation to the AMAs.....	28
McMullen Valley Groundwater Basin.....	28
Butler Valley Groundwater Basin.....	28
Harquahala Valley Irrigation Non-Expansion Area	29
Fees for Transportation.....	29
Excess Recharge Credits.....	30
Effluent Within AMAs	30
Poor Quality Groundwater Within AMAs.....	30
Ocean Desalinization	31

LIST OF TABLES

	PAGE
TABLE 1 General Schedule of CAGR D Water Supply Acquisitions.....	8
TABLE 2 Summary of Potential Water Supplies.....	10
TABLE 3 Colorado River Water Supply Priorities Within Arizona.....	17
TABLE 4 Potential Magnitude for CAP Indian Leases.....	24
TABLE 5 Groundwater Transportation Fees.....	30

LIST OF FIGURES

FIGURE 1 Schematic of Yuma Area Canals.....	25
FIGURE 2 Yuma Area Drainage Wells.....	26
FIGURE 3 Groundwater Levels In The Yuma Valley 2009.....	27

CHART

CHART 1 Timing, Estimated Magnitude and Term For the Acquisition of Water for the AWBA and CAGR D.....	9
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LIST OF APPENDICES

1. Appendix 1 - List of Colorado River Contractors
2. Appendix 2 - Maps of Colorado River Contractors
3. Appendix 3 – Colorado River Water User Profiles
 - 3 (a) - Indian Tribes
 - 3 (b) - Irrigation Districts
 - 3 (c) - Individual Agricultural Contractors
4. Appendix 4 - Yuma Area Maps
5. Appendix 5 - Arizona Department of Water Resources Substantive Policy CR 7 Policy and Procedures for Transferring an Entitlement of Colorado River Water

CHAPTER I - INTRODUCTION

This report includes a preliminary description of water supplies that could possibly be acquired to meet water supply needs of the Arizona Water Banking Authority (AWBA) and the Central Arizona Project.

AGENCY OBJECTIVES

Arizona Water Banking Authority Objectives

The primary objective of the AWBA is to identify water supplies that may be acquired to insure that sufficient credits are available to meet the obligation to deliver 1.25 million acre-feet (MAF) to the Southern Nevada Water Authority (SNWA). The secondary objective for the AWBA includes firming the allocations of Central Arizona Project (CAP) water for Indian Water Right Settlements.

Interstate Water Banking Agreement

Approximately 582,000 AF of credits were created by the AWBA by the first part of 2010 to fulfill the Interstate Water Banking Agreement with the SNWA, but another 668,000 AF of credits will be needed. On an annual basis, the SNWA may request up to 40,000 AF per year be made available within a three year build-up schedule. Because recovery is not anticipated before 2018 unless a Colorado River shortage is declared, the amended agreement specifies that SNWA will provide a schedule for recovery by 2015 and it will amend the schedule three years prior to the anticipated recovery year. During a shortage on the Colorado River, in addition to the annual recovery, SNWA may request credits equal to the reductions in water supply caused by the shortage. Depending on the size of any declared shortage, the maximum shortage reduction to the SNWA is set by the U.S. Bureau of Reclamation (Reclamation) guidelines. The shortages for SNWA will be 13,000 acre-feet during the first shortage level, 17,000 during the second level and 20,000 acre-feet during the third level. The guidelines extend through 2025. During shortage conditions, Arizona water users have first priority to the use of its recovery facilities, although dedicated recovery facilities may be constructed for SNWA at its cost. If insufficient facilities are available to Arizona users, the amount of water delivered to SNWA may be reduced. Also, the maximum amount of credits available during shortages may be proportionally reduced if the CAP municipal and industrial subcontractors require reductions.

The acquisition of potential water supplies involves many considerations. For the acquisition of water supplies to meet the SNWA obligation the following considerations will apply.

1. The SNWA agreement is a fixed obligation for 1.25 MAF of long-term storage credits, of which 668,000 acre-feet more credits are needed. Because the obligation is for a fixed volume of water and not a permanent supply, the AWBA has the flexibility to consider several options for meeting interstate water banking needs.

- However, the ability of the AWBA to acquire water supplies is constrained by limitations to its authorities.
2. The obligation to deliver water is expected to phase-in over several years. At this time the SNWA has informed the AWBA that it will most likely not need banked water for at least 5 years for the development of credits. Therefore, the actual use of any acquired water may not occur for several years. Water rights might be acquired and held until such time that long-term storage credits need to be created in the future. The acquisition of permanent water rights might create opportunities with the Central Arizona Project (CAP) to use the water for other purposes until they are needed by the AWBA.
 3. The total time period that credits have to be available annually under the agreement, assuming deliveries of 40,000 acre-feet per year, is over 31 years. Given the uncertainty of the build-up schedule, the water supply needed to meet the interstate obligation should be available through the end of the agreement, June 1, 2060, for planning purposes.
 4. If there is shortage in the next ten years, the AWBA can use current assets to meet the obligation to the SNWA. This gives the AWBA some flexibility in the timing of the acquisition of any potential water supply.
 5. The final decision for any water supply acquisition will depend on the financial decisions by the AWBA, including the timing for the expenditure of the SNWA funds and the use of the Nevada Resource funds. It is assumed that the AWBA prefers that the funds from SNWA should be spent as they come available per the interstate agreement. The amended interstate agreement calls for \$230 million to be paid in annual payments of \$23 million between 2009 and 2018. The amounts and timing of the payments could be different from this schedule based on the availability of water and changes to the financial arrangements between the AWBA and SNWA.

Indian Water Rights Settlements

The AWBA also has obligations to supply credits or water during shortages to firm up to 15,000 AF per year of water for the Gila River Indian Community (GRIC) and up to 8,724 AF per year for future settlement agreements with Arizona Tribes. At this time, Arizona has agreed to firm 3,750 acre-feet of non-Indian agricultural priority water supply for the White Mountain Apache Tribe (WMAT) Water Rights Quantification Act of 2009. (The Act, HR1065 is pending Senate action). The water would only be needed occasionally during declared shortages in the Lower Colorado River. The obligation ceases after 100 years from the date of the enforcement of this provision in the settlements. The total amount of the water supplies that may be needed to firm the entire 23,724 acre-feet over the one hundred year period is estimated by the AWBA staff, based on the current analysis of the probability of shortages, to be as much as 550,000 AF. The funding for the cost of the Indian firming water comes mainly from groundwater withdrawal fees. In the past, legislative appropriations have also been part of the funding source. The potential to meet part of the Indian firming obligation might be a consideration when evaluating the suitability of any potential water supply.

Considerations for the acquisition of water to firm the water supplies for Indian Water Right Settlements include:

1. The annual obligation to deliver water to Indian CAP contractors occurs only during declared shortages.
2. The need for firmed water in the next ten years is limited. Only the GRIC has an agreement for firming at this time. The WMAT is a potential agreement in the next few years. Other settlements are still pending successful negotiations. If a declared shortage occurs within the next ten years, any obligation might possibly be met within the water supply available to the CAP.
3. The obligation is expected to phase-in as the Tribes increase water demand over time. The AWBA may not have to firm supplies for several years, possibly for decades, because the actual tribal uses will not be curtailed unless water demand exceeds the supply available to the Tribes in a shortage year.
4. Several cities intend to lease the WMAT CAP allocation. If the Settlement Act passes, the cities may begin using the leased water in the short-term, which could create the need to firm during shortages that occur in the next decade.
5. The obligation is for a fixed period of time.

Central Arizona Groundwater Replenishment District (CAGRDR) Objective

The CAGRDR is obligated to replace groundwater pumped by its member lands and member agencies so that its members can be assured that a long-term dependable water supply is available. The CAGRDR anticipates that it will need water supplies to meet its long-term obligations. The member lands and member agencies fund the acquisition.

In its 2004 Plan of Operation, the CAGRDR projects that a total of 223,500 acre-feet of water will be needed annually by 2035 to meet its obligations created by current and future enrollments in the district through 2015. The build-up of the demand for replenishment is shown in Table 3.6 of the Plan. CAGRDR intends to acquire new water supplies to meet its obligations after members and lands enroll, but five years ahead of the time that the supply is actually needed. In the Plan, CAGRDR estimates of the amounts of water that will be needed are shown in Table 1. The definition of long-term for the purposes of the CAGRDR is a supply that is available for at least one hundred years. Short-term supplies assume acquisition time periods of thirty-five years or less. However, the short-term water supplies are intended to meet long-term obligations. Therefore short-term acquisition will have to be renewed or replaced to provide for a permanent water supply for member lands and agencies.

TABLE 1
General Schedule of CAGR D Water Supply Acquisitions

Supply Description	Term	Annual Volume (AF)	Estimated Year that Usage Begins
CAP Supplies			
M&I Subcontract	Long-term	7,746	2005
Indian Leases	Long-term	20,000	2012
Indian Leases	Short-term	42,500	2021
Effluent	Long-term	10,000	2008
Effluent	Short-term	28,000	2008
On-River Supplies	Long-term	15,000	2015
On-River Supplies	Long-term	25,000	2022
On-River Supplies	Short-term	30,000	2018
Imported Groundwater	Long-term	35,000	2027
<hr/>			
Totals	Long-term	112,746	
	Short-term	100,500	

Source: CAGR D Plan of Operation, November 8, 2004, Table 4.2, Page 49

Not included in the potential water supplies is the possibility for an allocation of non-Indian Agricultural priority water available from the Arizona Water Settlement Agreement. CAGR D intends to apply for an allocation.

Other CAP Objectives

Many water providers are contemplating the need for long-term supplemental water supplies to meet projected growth. Water may be needed to extend the ADWR designations of assured water supplies for some providers after the next ten years. The CAP is actively discussing the possible operational changes necessary to meet future demands through its Acquisition Development and Delivery (ADD) water process. These discussions are leading to further considerations about the need for new water supplies within the CAP Service area. CAP or its subcontractors will fund the acquisition of any new water supplies.

CONSIDERATIONS FOR THE MAGNITUDE AND TIMING OF WATER SUPPLY ACQUISITIONS

The AWBA and the CAP have different projected water supply needs. However, both agencies need to acquire a substantial amount of water in the next ten to twenty years. A collaborative acquisition program between the AWBA and the CAGR D in particular would reduce competition and increase the potential for successfully obtaining water to meet the objectives of the two agencies in a timely and cost effective way. Chart 1 shows the potential timing and magnitude for the acquisition of water to meet only the interstate water

banking obligation and the annual replenishment obligations projected by CAGR D through 2015. The chart illustrates that a substantial amount of water will need to be acquired to meet the annual water supply demand. The current economic conditions are expected to slow the projected build-up of water needs, but the actions to acquire water must certainly be planned and implemented. In the Chart, the supply need for the AWBA is projected to be forty to fifty thousand acre-feet per year over a term of approximately ten years. The actual amounts will depend on the amount of Intentionally Created Unused Apportionment water that SNWA will direct to the AWBA and the amount of excess water available from the CAP. The schedule of payments from SNWA to purchase water will also influence the amount water that can be purchased. To meet its projected annual demands through 2015, the CAGR D intends to acquire considerable amounts of short-term water supplies with terms of less than thirty-five years. But as noted, contracts for short-term supplies will have to be replaced or renewed at the end of the term. CAGR D also intends to acquire long-term supplies with terms greater than one hundred years as soon as possible. The projected acquisitions must ramp-up rapidly in the next few years to meet the projected water supply needs. As the economy improves, the projected need grows from 78 thousand acre-feet to over 100 thousand acre-feet. Within twelve years, the water need could approach nearly two hundred thousand acre-feet per year.

<p align="center">Chart 1 Timing, Estimated Magnitude and Term For the Acquisition of Water for the AWBA and CAGR D</p>															
Year Term	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2027	Extended Period
Temporary (Short-term) Acquisition															
AWBA 10 YR	40 to 50 KAF Per Year														
CAGR D 30 YR	28 KAF/YR													+ 17 YRS	
CAGR D 30 YR									30 KAF/YR					+ 25 YRS	
CAGR D 30 YR											42.5 KAF/YR			+ 28 YRS	
Long-term Acquisition															
CAGR D 100 YR	10 KAF/YR														
CAGR D 100 YR			20 KAF/YR												
CAGR D 100 YR						15 KAF/YR									
CAGR D 100 YR													25 KAF/YR		
CAGR D 100 YR														35 KAF/YR	
Total Annual Supply	78 KAF		98 KAF			113 KAF			143 KAF			145.5 KAF	170.5 KAF	205.5 KAF	

LIST OF POTENTIAL WATER SUPPLIES THAT MEET THE OBJECTIVES

Several different potential water supplies may meet the objectives of both the AWBA and CAP. In general, the potential supplies can be categorized as 1) Colorado River Entitlements held by irrigation districts, individual land owners and Indian Tribes; 2) CAP water allocations; 3) groundwater located in basins outside of the Active Management Areas; 4) long-term groundwater storage (recharge) credits; 5) effluent and poor quality water; and, 6) large scale interstate or international augmentation projects, including desalinization. Table 2 summarizes these water supplies.

Categories of Potential Water Supply	Acquisition Method	Comments
1. Priority 1 Colorado Contracts	Purchase or lease: 1) land and water contract Entitlements, 2) water contract only. Conditional forbearance agreements to create unused Entitlements.	Pre-1928 Contracts
2. Priority 3 Colorado River Water Rights		Post 1928–Pre 1968 Contracts
3. Priority 4 Colorado River Water Rights		Post 1968 Contracts
4. Priority 5 Colorado River Rights		Unused Arizona Apportionment
5. Priority 6 Colorado River Rights	The existing CAP contract is sufficient.	Surplus water during declared surplus conditions
6. Mainstream Decreed Indian Tribal Rights	Lease options to be determined	Generally Priority 1
7. CAP Tribal Contracts	Leases and Forbearance agreements	
8. Yuma Basin Groundwater	Exchange and Groundwater Transportation Permit	Requires desalinization
9. Groundwater from Harquahala, Butler or McMullen Valley	Purchase or lease lands for Groundwater Transportation	
10. Excess Recharge Credits	Purchase agreement	
11. Effluent within AMAs	Purchase agreement	
12. Poor Quality groundwater within AMAs	Obtain withdrawal Permit for poor quality groundwater	May require special water treatment including desalinization of brackish water
13. Ocean Desalinization	Interstate/international agreements	

ACQUISITION ISSUES

The evaluation of potential water supplies requires the consideration of many issues including legal considerations, water supply reliability, availability of willing sellers, third party and environmental considerations, and acquisition costs. These issues are unique for each supply, which makes the evaluation of the suitability of each water supply complex.

Issues That Apply to All Water Supplies

Availability of Willing Sellers

1. Who are the potential sellers, leasers, or partners?
2. What types of agreement, method or conditions are proposed for the acquisition (i.e. land fallowing, land purchase, options, leasing, lease backs, etc)?
3. What is the potential for successfully completing an agreement?
4. What types of processes, individual negotiations or competitive proposals are most conducive to attracting sellers?

Water Supply Reliability

1. What is the potential volume of each source of water supply?
2. What is the potential for shortages or other interruptions of supply?
3. When will the water supply be available?
4. Is the supply continuously available for an indefinite period or is it limited in amount or only available for a set period of time?
5. Are there any operational impacts or groundwater management impacts caused by the recharge and recovery of water?

AWBA/CAP Authorities

1. What are the specific authorities for the CAP or the AWBA to hold water contracts, enter into agreements or obtain permits for use of specific water supplies?
2. What cooperative arrangements can the AWBA and CAP use to acquire and hold water rights or leases for the benefit of both agencies?
3. What are the procurement processes, including timelines, public input, potential administrative hearings and decision process for each type of acquisition?
4. How will CAP classify the water supply (i.e. Project or non-Project water)? How will the classification affect the reliability and cost of the water?
5. What are the roles and responsibilities of ADWR, USBR, other states or agencies in the regulation of the acquisition of the sources of water? What regulations or policies help or hinder water supply acquisition?

Acquisition Costs

1. For all Colorado River water and CAP water, what expenses will be incurred for Reclamation administrative costs, environmental compliance and professional services costs for negotiating acquisition?
2. What will the Entitlement transfer cost be? How will the transfer cost be structured (i.e. annual payment or upfront price, or holding charge and annual payment)? What are the elements of any specific potential transfer such as land purchase, land lease, water purchase?
3. For water supplies that require facilities construction, what are the expected facilities that will be needed (pumping plants, wells, pipelines, treatment plants) and what are the capital costs and annual operating costs?
4. Are there additional annual operating costs for importing water through the CAP canal?

5. What is the potential for cost share partners?

Issues - Non-Indian Colorado River Contracts

Legal Considerations

1. What is the priority of the contract?
2. Is the contract a consumptive use or diversion contract?
3. Is the contract Entitlement subject to any constraining federal laws (i.e. Ak-Chin Act)?
4. Who owns the contract (i.e. a district or individual)?
5. Are there any particular constraints in the contract that affect acquisition and transfer?
6. What are the requirements of the Arizona Department of Water Resources substantive policy that must be met?

Third Party and Environmental Considerations

1. Are sufficient water supplies available for long-term M&I development and water acquisition? Can the supplies be acquired with minimal economic impact to the local communities?
2. Can the method of water supply acquisition minimize local impacts?
3. How can benefits be extended to other Arizona water users as part of the acquisition?
4. Can water contracts avoid urbanization corridors or be compatible with county or city land use plans?
5. What other potential entities may desire to acquire water supplies?
6. In the Yuma area, will any acquisition impact the ability of the federal government to meet its salinity obligations under Minute 242 of the 1944 Treaty with Mexico?
7. Is the proposed acquisition compatible with the Lower Colorado River Multi-Species Conservation Program? What is the extent of environmental compliance for the acquisition?
8. If unused apportionments are acquired, what will be the impact on CAP excess water customers?

Issues - Mainstream Decreed Indian Entitlements

Legal Considerations

1. The State of Arizona contends that the decreed water rights for the tribes cannot be moved outside of the Reservation boundaries without express authorization from Congress. The tribes disagree. Is there a way to avoid legal challenges, but lease and forebear water uses for CAP?
2. How would any potential agreement be quantified and enforced?

Third Party and Environmental Considerations

1. Is the proposed acquisition compatible with the Lower Colorado River Multi-Species Conservation Program? What is the extent of environmental compliance for the acquisition?
2. If unused apportionments are acquired, what will be the impact on CAP excess water customers?

Issues - CAP Indian Communities

Legal Considerations

1. What is the potential for long-term leases with CAP Indian Communities under the provisions of the different water rights settlements?
2. How can any credits created with leased Indian water be used for interstate banking?

Third Party and Environmental Considerations

What will be the impact on the availability of water for excess CAP water customers?

Issues - Yuma Area Groundwater Transportation

Legal Considerations

1. What are the Arizona groundwater transportation permit requirements for transporting from the Yuma Groundwater Basin?

Third Party and Environmental Considerations

1. What are the groundwater impacts or benefits of transportations from the Yuma Groundwater Basin?
2. What are the impacts of brine stream disposal from treating poor quality groundwater in the Yuma Groundwater Basin?

Issues - Other Interbasin Groundwater Transportations

Legal Considerations

1. What are the legal requirements under state law for transporting groundwater from Butler, Harquahala, and McMullen Valley basins?
2. What is the potential nature of contractual arrangements that may be needed to obtain water supplies in these basins?
3. How can any credits created from groundwater transportation be used for interstate banking?

Third Party and Environmental Considerations

1. What are the expected impacts on existing uses in the remote groundwater basins from the mining of groundwater?

Issues - Effluent within AMAs

Legal Considerations

1. What types of contractual agreements are necessary to obtain effluent from wastewater treatment plant owners?

2. What potential discharge permits or other requirements may be needed for recharge or recovery of effluent?

Third Party and Environmental Impacts

1. What water quality impacts are expected from the recharge of effluent?
2. What are the impacts or benefits on groundwater or surface water from the transportation and recharge of effluent within the AMAs?

Issues - Poor Quality Groundwater

Legal Considerations

1. What groundwater code and regulations apply to the withdrawal and use of poor quality groundwater?
2. What are the potential discharge permits, or other requirements that may be needed for recharge and recovery of poor quality groundwater?
3. What issues regarding brine stream disposal must be addressed?

Third Party and Environmental Impacts

1. What water quality impacts are expected from the recharge of effluent?
2. What are the impacts or benefits on groundwater from the transportation of poor quality groundwater within the AMAs?

Issues - Ocean Desalinization

Legal Considerations

1. What types of interstate agreements are necessary to construct and operate desalinization plants?
2. What types of interstate and federal agreement, rule or other regulations are needed for the exchange of desalinated water on the Colorado River?
3. What type of international agreements, treaties or other arrangements are needed for the construction and operation of desalinization plants in Mexico?

CHAPTER II – DESCRIPTION OF WATER SUPPLIES

Introduction

The purpose of the preliminary description of the water supplies is to provide a general overview of the nature of the different supplies. Because the legal and institutional constraints on the proposed water supplies are very complex, this summary only provides limited information to begin the basic understanding of the nature of the water supplies. As questions arise, or if a willing seller proposes a water transfer, much more in-depth research for a particular water supply will need to be undertaken.

Colorado River Water Contracts

Pursuant to the U.S. Supreme Court Consolidated Decree of 2006, *Arizona v. California*, any person using Colorado River water must obtain a contract from the Secretary of the Interior (Secretary) pursuant to Section 5 of the 1928 Boulder Canyon Project Act (BCPA) or other applicable federal statute. As a matter of practice, the Lower Colorado River Regional Office of Reclamation administers the contracts. Section 5 contracts, referred to as Entitlements, are permanent allocations of water to the users.

For water uses that were perfected before the BCPA, the Consolidated Decree prescribes the quantity and use of water for those Entitlements. These rights are referred to as Present Perfected Rights (PPRs) or Miscellaneous PPRs (MPPRs). The Consolidated Decree also describes, quantifies and establishes the priority date for water Entitlements created under federal statute for Indian Reservations and other federal establishments such as wildlife refuges.

Within Arizona, the Section 5 contractors and federal Entitlements are categorized into a priority system based on the date of the contract or the priority date in the Decree. The contracts describe the conditions for use of the allocations and delivery of water to the contractors. During shortages on the River, the Priority 4 and 5 users are the first to be shorted. The priority system for Arizona contractors is described in Table 3 of this report.

Contractual Considerations for Colorado River Water

The federal government and tribes do not have contracts *per se*, but the U.S. Bureau of Reclamation administers the water rights pursuant to the authorities of the Decree and its requirements.

For non-federal entities, there are three general types of water contracts in Arizona. The *beneficial use* types of contracts do not specify any specific quantity of water that may be diverted or consumed. These contracts specify a diversion rate for a district and the requirement that the water be used for the beneficial irrigation of lands within the district. These types of contracts generally apply to districts that have Priority 1, Decreed Entitlements. The contracts for the Yuma County Water Users' Association (YCWUA) and the Unit B District are examples of this type of contract.

The second type of contract is a *consumptive use* contract. The limit to the annual water allocation is measured as a consumptive use. Consumptive use is calculated as diversion minus return flow to the River. Return flow is that water that can be used for delivery to other downstream water users or to meet the water delivery obligation to Mexico. Four large districts in the Yuma area have these types of contracts, the Yuma Irrigation District (YID), North Gila Valley Irrigation District (NGVID), Yuma Mesa Irrigation and Drainage District (YMIDD) and the Wellton-Mohawk Irrigation and Drainage District (WMIDD). (These districts are part of the Gila Project. The YID, NGVID, and YMIDD are collectively called the Yuma Mesa Division of the Gila Project.)

The third type of contract is the *diversion contract*. The limit to the annual water allocation is measured as a diversion from the River. All of the priority 4, and 5 contracts are of this type.

Contracts may cover a combination of priority of rights. For example, the YCWUA, Unit B and NGVID have both priority 1 and 3 rights within their contracts.

Tables showing the list of contractors and maps showing the location of the contractors are included as appendices. In addition to the list of contractors, profiles of the irrigation districts, Indian Tribes and individual agricultural contractors are included. The profiles show the history of water diversions, returns and consumptive uses for the Entitlement holders through 2008.

Colorado River Contracts - Priorities

Priority 1 and 2 Rights – Federal Reserved Rights

The federal government and Indian tribes have PPRs, and Priority 2 rights that were established after 1929, but before 1968. Federal reserved rights are for specific uses that meet the purposes of the federal reservation. For example, for wildlife refuges, the water allocation is to fulfill the purposes of the refuge as described in its enabling legislation. Transferring a federally reserved right is not likely without federal legislation that redefines the water needed for purposes of the reservation. Transferring Decreed water rights from Indian Tribes for use off reservation without specific Congressional authorization has not occurred in the Lower Colorado River Basin. In the late 1990's, the Chemehuevi Tribe in California applied to the Bureau of Indian Affairs to lease a portion of its unused present perfected rights to a private water company. Comments on the proposed lease by the Arizona Department of Water Resources (ADWR) representing the views of the State of Arizona and others challenged the legality of the lease proposal because there was no federal authorization. Specifically, ADWR cites federal law that the Colorado River present perfected right is a property right held in trust for the Indian Reservation and while it can be leased with land on the Reservation it cannot be severed from the Reservation for use elsewhere. In particular, ADWR and others referred to the Indian Non-intercourse Act that prohibits the transfer of Indian property without an act of Congress.

Table 3

Colorado River Water Supply Priorities Within Arizona

Within the State of Arizona, the following priorities shall apply in the administration of Mainstream Water. The second and third priorities are coequal.

Priority 1

Satisfaction of Present Perfected Rights established prior to June 25, 1929, the effective date of the Boulder Canyon Project Act, as defined and provided for in the Decree.

Priority 2

Satisfaction of Secretarial Reservations and Perfected Rights established or effective prior to September 30, 1968, but after June 25, 1929.

Priority 3

Satisfaction of Entitlements pursuant to contracts between the United States and water users in the State of Arizona executed on or before September 30, 1968, but after June 25, 1929.

Priority 4

Satisfaction of Entitlements pursuant to: (i) contracts, secretarial reservations, and other arrangements between the United States and water users in the State of Arizona entered into or established subsequent to September 30, 1968 for use on federal, state or privately owned lands in the State of Arizona (for a total quantity not to exceed 164,652 acre-feet of diversions annually); and (ii) Contract No. 14-06-W-245 dated December 15, 1972, as amended, between the United States and the Central Arizona Water Conservation District for the delivery of Mainstream Water for the Central Arizona Project, including use of Mainstream Water on Indian lands. Entitlements having a fourth priority as defined in (i) and (ii) herein are co-equal. Reductions in Entitlements having a fourth priority shall be borne by each Entitlement holder in the same proportion as its Entitlement, or as required by law or regulation. If, however, a reduction sharing agreement is entered into between two or more such authorized users, then the reduction shall be shared among the parties as provided in the agreement, subject to approval by the Reclamation contracting officer after consultation with the Arizona Department of Water Resources.

Priority 5

Satisfaction of Entitlements to any Unused Arizona Entitlement or Unused Apportionment Water.

Any entity with a contract for fifth-priority water shall utilize its fifth priority Entitlement only after the Contracting Officer has determined that Mainstream Water is available under applicable law or regulation, and the Contracting Officer provides written notification that such Mainstream Water is available in a specific year, subject to the scheduling and the reduction provisions of the contract. Reduction or elimination of the fifth-priority water use shall be determined by the Contracting Officer after consultation with ADWR, or on the basis of the contract dates, or as required by law or regulation.

Priority 6

Satisfaction of Entitlements to Surplus Water.

Any contractor for sixth-priority water shall utilize its sixth-priority Entitlement only after the Contracting Officer has determined that Mainstream Water is available under applicable law or regulation, and the Contracting Officer provides written notification that such Mainstream Water is available in a specific year, subject to the scheduling and reduction provisions of the contract. Reduction or elimination of the sixth-priority water use shall be as determined by the Contracting Officer or on the basis of the contract dates, or as required by law or regulation.

Facing potential litigation, the Chemehuevi Tribe withdrew its proposed lease, but no legal finding was made and the issue remains open regarding whether or not Indian PPRs can be leased.

Priority 1 Rights – Non-federal PPRs

The water rights for the YCWUA and the Unit B District are examples of non-federal PPRs. In these cases, the Decree sets forth the location, amount and type of use of the water that is under contract. Transferring these rights to a new place of use for a purpose other than irrigation has not been done within the Lower Basin. The process for accomplishing the transfer of a Priority 1 right is unknown. However, the U.S. Supreme Court has delegated considerable discretion to the Secretary pursuant to the BCPA and transfers of these types of rights via administrative action may be possible. Further legal research and consultation with the Secretary, Reclamation and the parties to the Decree would need to be completed before the transfer of a Priority 1 Right can be considered feasible. The YCWUA has taken the position that the water allocation to the district is attached to the lands within the Association. Consistent with this position, the YCWUA and the City of Yuma have entered into an agreement that allows the City to convert the water apportioned to the YCWUA for domestic purposes on lands that are served by the City and within the Association boundaries. (Contract No. 176r-671, 1996). This contract will restrict Entitlement transfers from the YCWUA.

Within California, water transfers have been accomplished through forbearance, rather than direct transfer of the water Entitlement. For example, the Metropolitan Water District of Southern California (MWD) has agreements in place with the Palo Verde Irrigation District (PVID) to fallow lands. MWD has a lower priority within California than the PVID. Any unused water that is available through the fallowing and forbearance can be diverted by MWD for its use. Other users higher in priority than MWD have agreed to allow the transfer.

This type of agreement might be used to transfer water within Arizona. Any reduction in water use by a higher priority water Entitlement holder would accrue to the CAP, which has the last Arizona priority within the normal Colorado River water apportionment of 2.8 MAF in the Lower Colorado River Basin. Accounting and legal issues to create a forbearance to the CAP would need further study and consultation with the Secretary before the legal feasibility for this type of transfer can be determined.

Priority 3 Entitlements

Priority 3 Entitlements offer the most flexibility for water transfers. Several methods for water acquisition might be utilized including leasing of Entitlements, purchase of Entitlements, fallowing agreements, and dry year forbearance. Most Priority 3 contracts are consumptive use contracts. This is an advantage because the face value of the transfer will not be reduced to account for the loss of returns to the river if the water is diverted to the CAP. By policy, ADWR will only recommend water transfers that do not increase the consumptive use of the Colorado River supply. As a matter of practicality, returns to the river accrue to the benefit of the CAP. (See Appendix A5 for ADWR Substantive Policy CR-7).

To date, Entitlement sales have been rare. As part of the Ak-Chin Water Settlement of 1984, 50,000 acre-feet of water were transferred from the combined allocation of the Yuma Mesa Division of the Gila Project. Each District received cash remuneration for the improvement of on-farm systems and district water delivery facilities. The districts were also relieved of federal debt and full cost pricing under the Reclamation Reform Act (RRA). The portion of the Entitlement that was transferred was not in use at the time.

As part of the Salt River Pima-Maricopa settlement of 1988, seven Maricopa County cities paid Reclamation to purchase 22,000 acre-feet of water from a mainstream irrigation district. The Wellton-Mohawk Irrigation District agreed to retire some acres and transfer 22,000 acre-feet of water. In personal conversations with the past general manager, Mr. Clyde Gould, the estimated retirement by the district was approximately 2,000 acres. The district was relieved from federal repayment obligations and provisions of the RRA. The lands and water were in use at the time.

Priority 4 Entitlements

The allocation of water for Priority 4 mainstream Entitlements is based on provision 8.7(c) of the 1988 repayment contract with the CAP and Secretary, which states that “(t)he quantity of Colorado River water available under this contract for (CAP) project purposes, including water for use on Indian lands shall have the same priority as to delivery as the quantities of Colorado river water delivered to water delivery contracts, Federal reservations of water, and other arrangements between the United States and water users in Arizona entered into subsequent to September 30, 1968, for use of Colorado River water on Federal, state or privately owned lands in Arizona in total amounts not to exceed 164,652 acre-feet of diversions per year...”. Any contracts with the Secretary for permanent transfers of water to the CAP from a Priority 4 mainstream water user will need to clarify that the mainstream allocation has been converted to CAP project water and the amount of water that may be allocated as part of provision 8.7(c) in the repayment contract has been reduced.

Priority 4 contractors include several cities, towns and private water companies. On-river municipal contractors are projected to fully utilize their Entitlements. Future municipal water demands are projected by some cities to exceed the current Entitlements. To meet their future water needs, the cities in Mohave County that have Priority 4 contracts have purchased additional water contracts to expand their water portfolios. The agricultural water contractors include some individuals and two irrigation districts, the Cibola Valley Irrigation and Drainage District (CVIDD) and the Mohave Valley Irrigation and Drainage District (MVIDD). The MVIDD, south of Bullhead City, has a contract that allows water use for either irrigation or domestic use. The potential for water transfers from the MVIDD is limited because the MVIDD is expected to convert its irrigated lands and retain its allocation for on-site urban development.

The CVIDD has sold part of its Entitlement of 24,120 acre-feet. In November 2004, the Mohave County Water Authority (MCWA) executed a purchase agreement to obtain 5,997 acre-feet of Priority 4 Colorado River water from the CVIDD by purchasing approximately 1,000 acres of irrigated land. The Hopi Tribe executed a similar purchase agreement to obtain an equal amount of water with an equal amount of land. A private entity called The

Conservation Fund acted as an intermediate owner to carry out the transaction with the CVIDD landowners. To address third party impacts and obtain final federal approval of the transaction, the MCWA and the Tribe agreed to allow La Paz County to purchase up to 600 acre-feet of which 100 acre-feet have been assigned to Springs del Sol Water Improvement District. An additional 2,838 acre-feet was transferred to the Arizona Game and Fish Department for the MSCP. The result was a transfer of 4,278 acre-feet to the MCWA, and 4,278 acre-feet to the Hopi Tribe. The Entitlements may later be severed from the original land allowing the Cibola Valley land to be re-sold without an Entitlement. The intentions of the Tribe and MCWA are to sever and transfer the entitlement for future domestic uses. At this time, the lands are being leased for irrigated agriculture within the district until needed by the MCWA or Tribe.

In addition to the transfers to the MCWA and the Hopi Tribe, another entity, Cibola Resources , LLC purchased 60 acre-feet, which has been transferred to B&F Investments, LLC outside of the District. The Arizona Recreational Facilities, LLC has purchased 2,700 acre-feet for agricultural uses within the district boundaries. Approximately 1561 acres of irrigated lands, including 950 acres owned by the Arizona State Land Department (ASLD), representing 9,366 acre-feet of Entitlement remain as part of the District's Entitlement. The description of the MVIDD and transfers of Entitlement are included in the appendices.

Because the priority 4 contractors have diversion contracts, the amount of water that may be retired for use on the river and transferred away from the river would expected to be reduced in accordance to the ADWR substantive policy by the amount of return flow that currently occurs.

Priority 5 Entitlements

Priority 5 contractors have a lower priority than CAP. These contractors may only divert water in a year when all other contractors in Arizona have not ordered water for the diversion and consumptive use of 2.8 million acre-feet. The one exception to this general rule is that the statute limits the AWBA from storing Colorado River water that would otherwise have been used in this state pursuant to another Section 5 Boulder Canyon Project Act contract that has a priority that is equal to or higher than September 18, 2003. The statute goes on to state that the authority shall not store for interstate water banking purposes Colorado River water that would otherwise have been used in this state. This limitation is included in a provision of the Agreement for Interstate Water Banking, 2001 and all subsequent amendments. The effect of the statutory limits to the AWBA is that Priority 5 water contractors have been able to order and use water ahead of the AWBA. Some more water might be made available to the CAP and AWBA for interstate banking if such contractors forbear their water uses.

Since the CAP has a higher priority then the Priority 5 contract users, it can order water to meet the needs of its customers ahead of the Priority 5 users. Water not needed by long-term contractors and subcontractors is called excess CAP water and is sold annually to excess water contractors or subcontractors in the CAP service area. Amendments to the AWBA statutes in 2010 (ARS § 45-2427) allow the CAP to make excess CAP water available

exclusively to the AWBA for intrastate banking purposes. The effect of the amended statute allows the CAP to order water ahead of Priority 5 contractors for use by the AWBA. Additionally, if the CAP uses monies from the AWBA, it can acquire water for delivery to the AWBA for interstate purposes.

The amount of Priority 5 Entitlement that is in use is limited. For example, in 2006, the ASLD lease near Ehrenberg and another near Yuma show approximately 11,300 acre-feet of total diversion in 2007. Of that amount, approximately 5,200 acre-feet are estimated to be Priority 5 use. The CVIDD, Hopi tribe and AGFD have some Priority 5 Entitlement for use in the district, but the actual use has been limited in the past few years. No other opportunities are known.

Priority 6 Entitlements

Priority 6 is an Entitlement to order surplus water at such times Reclamation declares that more than 2.8 MAF is available to Arizona water contractors. If there were a surplus, the CAP and its subcontractors would have access to the supply. Normally during a surplus, more water than can be used is released to the River.

CAP Tribal Water Rights

Several Indian Water Right Settlements within the CAP service area have provisions for the long-term lease of water to municipalities. The tribes and settlements that have provisions for leasing include the following.

Salt River Pima Maricopa Indian Community Leases (1989) – The Salt River Pima Maricopa Indian Community Water Rights Settlement Act of 1988 (P.L. 100-512) allows the Community to enter into long-term leases of its CAP allocations. All of the water that is available for leasing has been leased.

A total of 13,300 acre-feet of CAP Indian priority water were leased for a period of 99 years beginning in the year 2000. With seven Maricopa County cities and towns. The leasing entities are: City of Phoenix, 3,023 acre-feet; City of Chandler, 2,586 acre-feet; City of Glendale, 1,814 acre-feet; City of Scottsdale, 60 acre-feet; City of Tempe, 60 acre-feet; City of Mesa, 1,669 acre-feet; and the Town of Gilbert, 4,088 acre-feet. Lease terms required an up front payment by the cities and towns to the Community of \$1,100 per acre-foot. The cities and towns were then responsible for all costs associated with the delivery and treatment of the CAP water, although they were not required to pay capital repayment charges.

Fort McDowell Indian Community Leases (1990) – The Fort McDowell Indian Community Water Rights Settlement Act of 1990 contains provisions allowing the Community to lease its CAP allocation for off reservation uses for a period of up to 99 years. The total CAP allocation under the settlement is 18,283 acre-feet. One such lease agreement, with the City of Phoenix, was completed within the first year of the lease in 2001. The lease amount was 4,300 acre-feet per year of CAP Indian Priority water. The lease costs the City

an upfront fee and then all additional costs for purchase and delivery of the CAP water are also borne by the City. The City is not required to pay any additional capital repayment charges since the water remains categorized as Indian water and therefore is not subject to a Federal repayment obligation. The Community holds an additional 13,933 acre-feet of CAP water that is eligible for future leases.

AK-Chin Indian Community Lease to Del Webb Corporation (1996) – The Ak-Chin Indian Community Water Rights Settlement Act amendment of 1992 allows the Ak-Chin Community to enter into long term lease agreements for the off-reservation use of the Ak-Chin Community's CAP water. The total amount of the allocation to the Ak-Chin Community is 75,000 acre-feet in a normal year: 27,500 acre-feet are based on its original CAP allocation and 47,500 acre-feet is priority 3 water allocated under the settlement. One lease was completed in 1996 with the Del Webb Corporation. The lease, which is for a term of one hundred years, was used to demonstrate an assured water supply for Del Webb's Anthem development in Maricopa County near the community of New River. Reported terms of the lease are for 10,000 acre-feet per year with an up front payment of \$12 million or the equivalent of \$1,200 per acre-foot. All additional fees for purchase, delivery and treatment of the CAP water will be borne by Del Webb. All of the rest of the allocation to the Ak-Chin Community is in use. A reduction in irrigated agriculture would have to occur to execute more lease agreements.

San Carlos Apache Tribe Leases (2000) – The San Carlos Apache Tribe Settlement Act of 1992 (P.L. 102-575) contains provisions which allow the Tribe to lease its CAP Indian and M&I priority water supply for off reservation uses within Maricopa, Pima, and Pinal Counties. The total allocation to the SCAT is 61,645 acre-feet. The City of Scottsdale entered into a lease with the Tribe for 12,500 acre-feet of Indian Priority CAP water. The lease terms are for a period not to exceed an one hundred year period but the leases are renewable. Leasing cities are required to pay an upfront payment equal to \$1,200 per acre-foot. Future leases will pay that fee subject to indexing for inflation utilizing the consumer price index. In addition to the above-mentioned general leasing authority, Congress authorized a specific lease of San Carlos Apache Tribe CAP water to the Phelps Dodge Corporation. P.L. 105-18 provided for a lease of 14,000 acre-feet per year of M&I priority CAP water to the mining company for a period of up to 50 years with the right to renew for another 50 years. The cost of the lease was listed as \$1,200 per acre-foot payable partially up front and partially as annual payments.

Gila River Indian Community Leases (2004-present) –The Arizona Water Settlement of 2004 (AWSA), Title II, Gila River Indian Community Water Rights Settlement, (P.L. 108-451) authorizes the Community to enter into long-term (not to exceed 100 years) leases of its CAP contract Entitlements with entities located in ten counties within Arizona. The total CAP allocation to the Community is 311,800 acre-feet of which 102,000 acre-feet is non-Indian agriculture CAP priority. The associated Settlement Agreement contains proposed lease agreements totaling 41,000 acre-feet per year of CAP Indian priority water. The proposed lessees are Goodyear, 7,000 acre-feet; Peoria, 7,000 acre-feet; Phoenix, 15,000 acre-feet; and Scottsdale, 12,000 acre-feet. The 41,000 acre-feet per year total are not a limit and other leases could occur in the future. Each leasing City is responsible for payment of all

delivery and treatment costs associated with the CAP water, but do not have to pay a capital repayment component. An upfront lease payment must be made and terms for the payment are described in the lease agreements. The lease payment is based on a base rate of \$1,203 per acre-foot in December 1993 costs. This value is subject to indexing using the latest consumer price index for all urban consumers. Using the formula set forth in the lease agreement, the lease rate in November 2006 would have been \$1,760 per acre-foot. The Settlement Agreement also provides for a lease by the Phelps Dodge Corporation of 12,000 acre-feet per year of Indian Priority CAP water for a term of 50 years with an option to renew for an additional 50 years. An initial payment of \$4.8 million (subject of indexing for inflation) is associated with this lease. Phelps Dodge also has an option for an additional lease of 10,000 acre-feet per year. If the option is exercised, Phelps Dodge will make a lease payment based on a fair market value determination.

Tohono O’odham Nation Leases - Title III of the AWSA, Southern Arizona Water Rights Settlement, authorizes the Tohono O’odham Nation to enter into leases up to 100 years. The amount of the allocation available for leases include up to 27,000 acre-feet of its Indian Priority CAP allocation and up to 28,200 acre-feet of its Non-Indian Priority allocation. Leased water must be delivered within the CAP service area. Other than this restriction, there does not appear to be any other limitations for leases 25 years or less. If the Nation proposes a lease of more than 25 years, it must initially make an offer to users within the Tucson AMA. The substantive terms of the proposed lease are to be included in the offer. If no entity in the Tucson AMA accepts the offer, the offer may be extended beyond the Tucson AMA. Before a lease may be finalized, entities in the Tucson AMA have the right to counter offer with matching or better terms. As part of the Water Settlement Agreement, Asarco Mining Company leased 10,000 acre-feet of water for 25 years with a provision that the Nation may extend the lease for 10 additional years.

Table 4 shows estimates of the amount of water possibly available for leasing from the CAP Tribes after deducting the amounts for current leases. The amounts are shown to illustrate the magnitude of the water that the Tribes have for use. The amounts that the Tribes may be willing to lease are unknown.

Table 4 Potential Magnitude for CAP Indian Leases		
Name	Potential Annual Amount	Notes
Fort McDowell Indian Community	13,933 AF	
Tohono O'odham Nation	~45,000 AF	Some water in use in 2009
Gila River Indian Community	~249,000 AF	AWBA using some of allocation for firming GRIC supply GRIC is recharging water in 2010
Ak Chin Indian Community	75,000 AF	Water supply currently in use
San Carlos Apache Tribe	~35,000 AF	

Transfers from the Yuma Groundwater Basin

Within the Yuma Groundwater Basin, lands that are in the floodplain must be drained to prevent high water tables and water logging. Reclamation, the YCWUA and Yuma County operate wells and drainage canals to maintain the water table at acceptable levels. The source of water is mostly return flow from irrigation in the basin. Figure 1 shows a schematic of the drainage and water delivery system for the Yuma Basin. A more complete schematic is attached in Appendix A4.

The open drains and drainage wells return water back to the Colorado River above Morelos Dam for diversion by Mexico, or to the YCWUA Main Drain in the Yuma Valley for transportation to the Southerly International Boundary for delivery to Mexico near San Luis, Arizona. There are two primary well fields that are operated by Reclamation. Water is pumped from the South Gila Well Field in the Yuma Irrigation District to the Gila River through the Discharge Pump Outlet Channels (DPOC). Water is pumped from the Yuma Mesa Well Field at the boundary between the Yuma County Water Users' Association and the Yuma Mesa Irrigation District and transported to the Colorado River through the Yuma Mesa Conduit. In addition, the Reclamation wells, Yuma County and the YCWUA own and operate wells. Some of the wells in the YCWUA also delivery water to the Main Drain that delivers water to the Southerly International Boundary via the Boundary Pumping Plant. The location of the wells is shown in Figure 2.

Irrigation on the Yuma Mesa has resulted in a groundwater mound that is above the elevation of the River. As a result of the mound and the deep percolation from the annual irrigation of lands in the YCWUA and the YID, lands that are lower in elevation than the Yuma Mesa would be water logged unless the drainage wells are operated. To encourage adequate drainage pumping, the Groundwater Code was modified to allow the exchange and transportation of the groundwater outside of the Yuma Basin. Prior to the modification of the Code, groundwater could not be directly or indirectly transported outside of the Basin. The Director of the ADWR may now issue a permit to withdraw groundwater that would not have returned to the River for transportation to other water users. For example, the CAP could operate wells in the Yuma Basin, move the water to the Colorado River for delivery to

Mexico and then increase its diversions of Colorado River water in exchange. Figure 3 shows the 2009 groundwater level map prepared by Reclamation.

Figure 1 Map of Yuma Area Canals

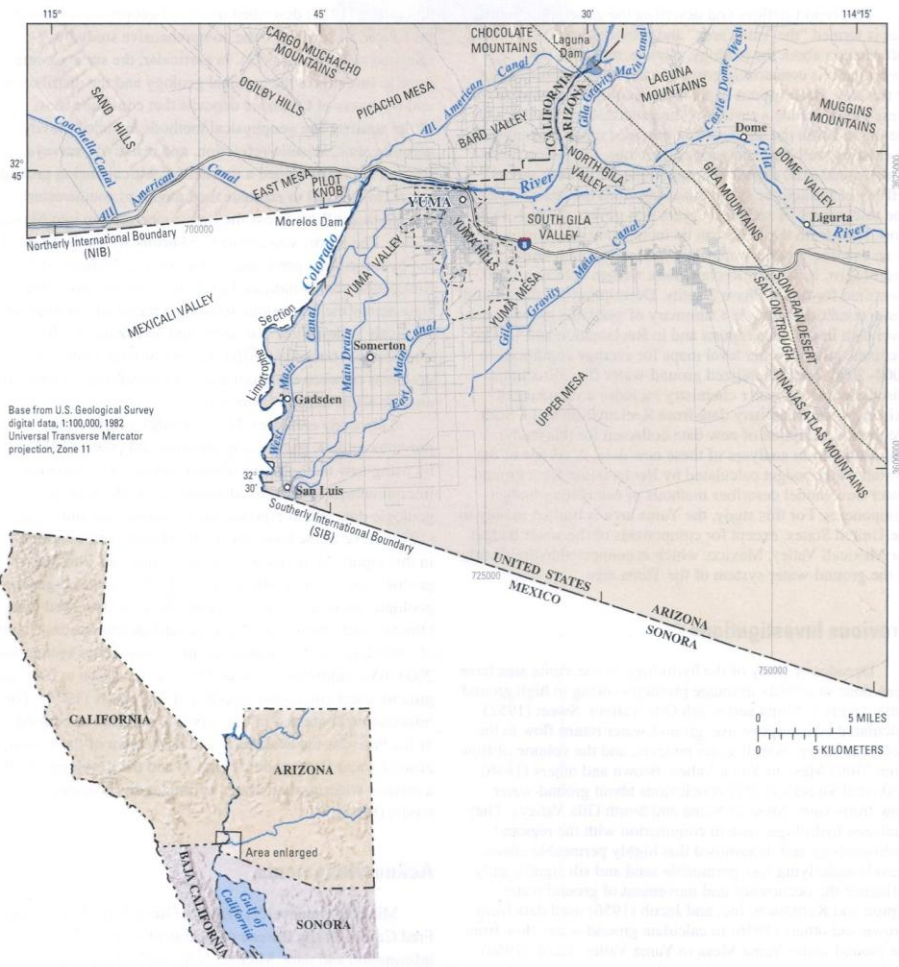


Figure 2 Yuma Area Drainage Wells

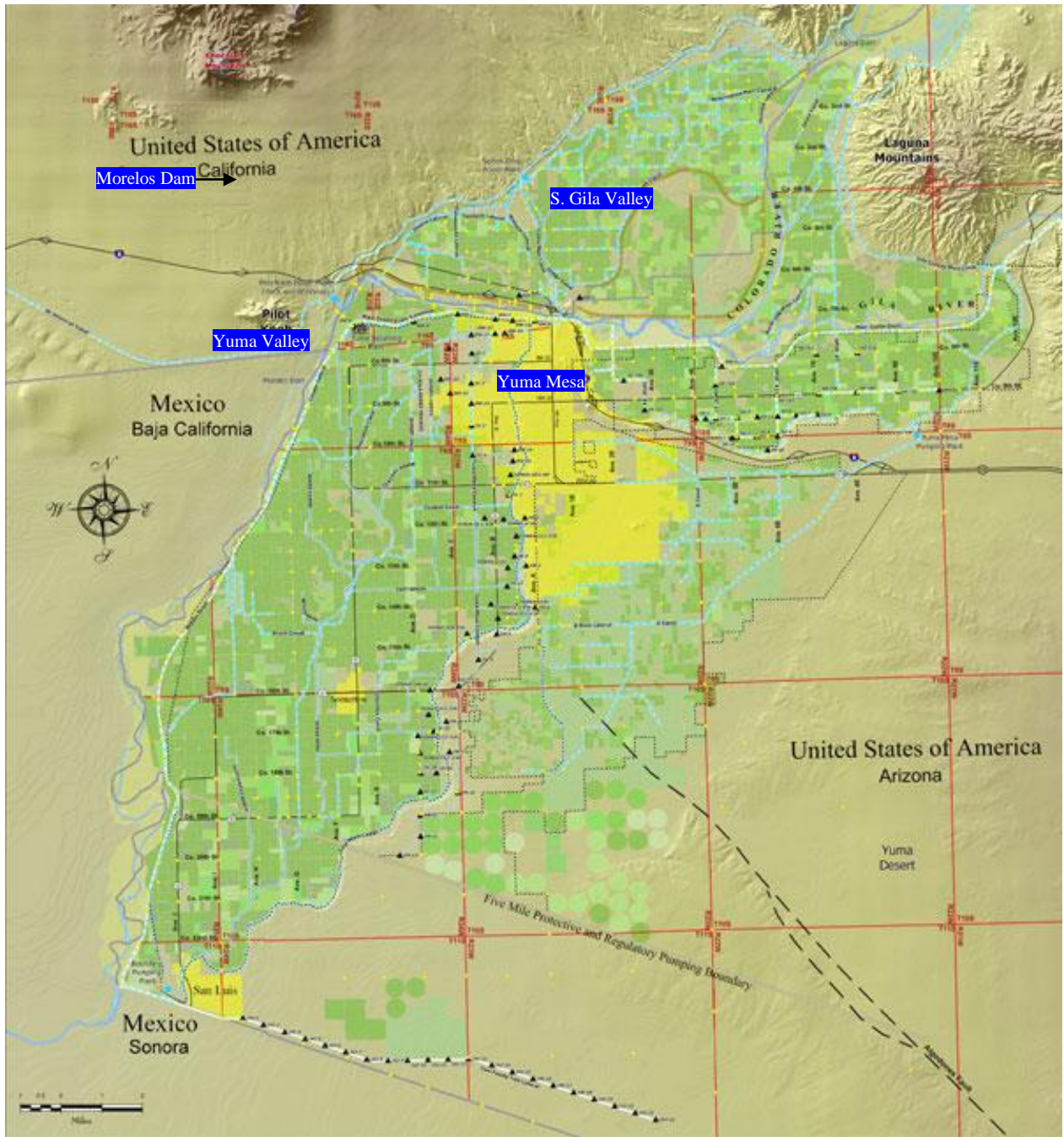
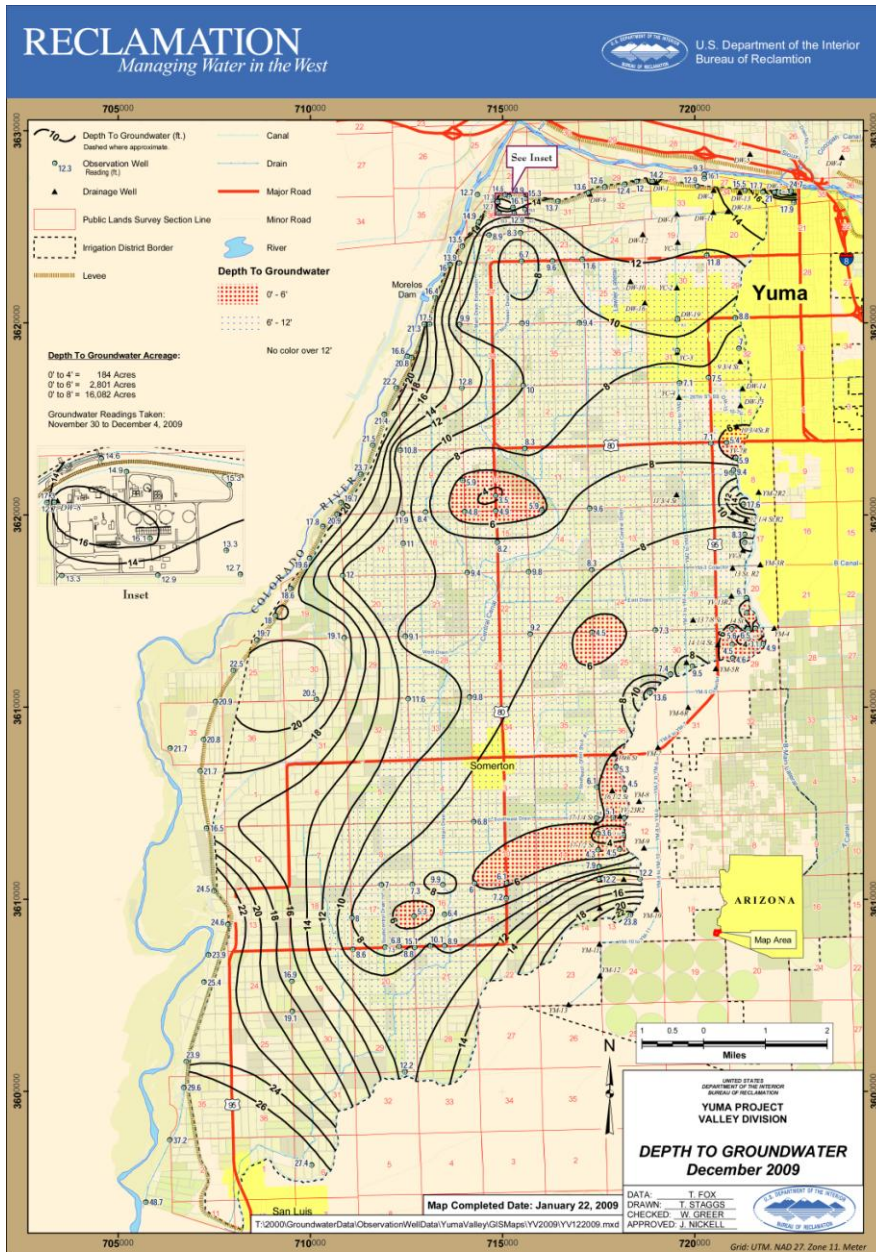


Figure 3 Groundwater Levels In the Yuma Valley 2009



Currently, Reclamation holds a permit to transport Yuma Basin groundwater for delivery to Mexico. The amount of the permit is for 25,000 acre-feet per year. The permit duration is ten years or when the water levels in the Yuma Valley reach 20 feet below land surface in specific areas, whichever occurs first. The permit may be renewed. Reclamation uses the groundwater in lieu of making releases from Lake Mead to meet the Mexico delivery requirements. Water is therefore conserved in Lake Mead. The major constraint to increasing groundwater withdrawals and delivering the water to the River is the salinity of the groundwater. As a result of this constraint, Reclamation is limiting its use of Yuma

groundwater until the returns can be desalted. If the CAP or AWBA intends to use this source of water, the water will have to be desalted before it is returned to the River.

In 2010, Reclamation is conducting a pilot operation of the Yuma desalinization plant. The pilot program will better refine the costs for operation of the plant so that the feasibility of treating Yuma groundwater can be determined. The YDP may not be authorized by federal law for use by the CAP or AWBA to desalt Yuma groundwater. Its actual purpose as stated in the Salinity Control Act of 1972 (P.L. 93-320) is to desalt return flows from the Wellton-Mohawk IDD for delivery to Mexico. If the operation of the YDP is not economically or legally feasible, another plant may have to be constructed to treat increased drainage deliveries to the River.

Groundwater Importation to the AMAs

McMullen Valley Groundwater Basin

A city that purchased lands historically irrigated before January 1, 1988 within the McMullen Valley Groundwater Basin may transport groundwater to the Phoenix AMA for use by a city, town, private water company or a groundwater replenishment district. ("Groundwater replenishment district" or "replenishment district" means a district that is established pursuant to title 48, chapter 27. This district is not the CAGR). A person that owned irrigated land in Maricopa County and the basin prior to that date may also transport water for the same purposes. A city, town, private water company or replenishment district may purchase the lands from the city or parties that owned the lands prior to 1988 and transport the water only for use by a city, town, private water company, or replenishment district or by the AWBA for Indian firming. The amount of water that may be transported is calculated based upon an annual allocation of three acre-feet per historically irrigated acre. In any year, up to two times the annual allotment may be withdrawn, limited to ten times the annual allotment in any ten year period, not to exceed a total of six million acre-feet from the basin. For use of the water for Assured Water Supply purposes, the depth to water is limited to 1200 feet below land surface, or a total depletion of 40% of the amount of water in storage, and the rate of decline for all uses within the basin cannot exceed 10 feet per year. The City of Phoenix is the only city that purchased lands before 1988. It owns approximately 14,000 acres of historically irrigated land, which it holds for future water supply development. The basin is estimated to hold 14 million acre-feet to a depth of 1200 feet. (Freethey and Anderson, 1986, USGS Hydrologic Investigations Atlas – HA664)

Butler Valley Groundwater Basin

Groundwater may be withdrawn from land owned by the state or by a political subdivision of the state in the Butler Valley groundwater basin for transportation to an initial active management area. Title to land in the Butler Valley groundwater basin that is owned by the state or a political subdivision of the state and from which groundwater is withdrawn for transportation to an AMA may be sold, exchanged or otherwise conveyed only to the state or to another political subdivision of the state. The ASLD owns a sizable portion of the lands in the Butler Valley. Of the 288 square miles in the basin, 126 square miles, or nearly 44% are

Arizona State Trust lands. The U.S. Bureau of Land Management owns 55.5% of the land. Only 0.6% of the land is privately held. If the state or a political subdivision of the state purchases or leases from the ASLD, the groundwater may be sold to the AWBA (a state agency) or be used by the CAWCD (a political subdivision) for the purposes of the CAGR. Although there are no limits placed on the transportation of groundwater, all such transportations are subject to damage rules. The minimum amount of water estimated to be in storage above 1200 feet is 2 MAF. The estimates of water in storage vary greatly from 2 MAF to 20 MAF. ADWR estimates a range between 6.4 MAF to 6.6 MAF. Freethey and Anderson, made the lowest estimate (1986, USGS Hydrologic Investigations Atlas – HA664). Of the three basins where groundwater is available for transport, the estimates of groundwater in storage vary the most for Butler Valley.

Harquahala Valley Irrigation Non-Expansion Area

If the state or a political subdivision of the state, such as the CAP, owns land eligible to be irrigated in the Harquahala Irrigation Non-Expansion area, they may withdraw groundwater from the land for transportation to an AMA for its own use or use by the AWBA for Indian farming. Several limits apply to the groundwater withdrawals. In general, the amount is three acre-feet per eligible acre per year. Up to six acre-feet per acre in any year may be withdrawn, but no more than thirty acre-feet in ten years. Withdrawals are limited to the depth of one-thousand feet and with water level declines of no more than a projected average of ten feet per year when added to the existing rate of decline over a period of one-hundred years. The Director of ADWR has some latitude to change the annual pumping limits if the damages to existing users are considered. Hypothetically, if all land owners agreed to a compensation package to waive damage claims, the Director might be able to approve a larger withdrawal from small tracts of land owned by an entity eligible to transport water, such as the CAP. Such agreements would entail complex, multi-party negotiations. The estimated amount of water in storage is approximately 13 million acre-feet to 1,200 feet below land surface. (Freethey and Anderson, 1986, USGS Hydrologic Investigations Atlas – HA664).

Fees for Transportation and Damage Rules

The director of ADWR sets a fee for the transportation of groundwater for remittance to the County from which the transportation takes place and leaves the county. The fee is set as shown in Table 5 and adjusted according to the annual changes in the gross domestic product (GDP) price deflator using the 1993 calendar year as the base year. The GDP and formula for calculation is defined in statute (ARS § 41-563).

All direct or indirect transportation of groundwater is subject to payment of damages pursuant to ARS § 45-545. In any court action to recover damages, the act of transportation cannot be presumed by the fact of the transportation. The court is required to consider mitigation actions including retirement of land from irrigation, discontinuance of other preexisting uses of groundwater, water conservation techniques, procurement of additional sources of water that benefit landowners.

Table 5 Groundwater Transportation Fees	
Net Groundwater Transported	Fee per Acre-Foot
0 – 1 Million Acre-Feet	\$3.00
> 1.0 - 2.0 Million Acre-Feet	\$5.00
> 2.0 - 3.0 Million Acre-Feet	\$7.50
> 3.0 - 4.0 Million Acre-Feet	\$10.00
> 4.0 – 5.0 Million Acre-Feet	\$15.00
> 5.0 Million Acre-Feet	\$30.00

Excess Recharge Credits

Some entities within the AMAs have purchased Excess CAP water for recharge. In some cases where the entities project that long-term credits are not needed, these entities may wish to sell the long-term recharge credits to the CAGR. Although some interest has been reported to the AWBA, the willingness of water providers to sell is unknown. No estimate of the potential magnitude of this supply is available. The authority of the AWBA to purchase such credits may also be a constraint.

Effluent Within AMAs

Effluent from wastewater treatment plants might be available from the municipalities that own such plants. The effluent has value to the municipalities because it can be used for turf irrigation and does not count against per capita conservation requirements. It can be used to create long-term storage credits. It can be sold or exchanged with agricultural interests. If effluent is available, the AWBA or the CAGR might be able to purchase the supply for recharge to create long-term storage credits. To be used, the effluent may have to be transported and new recharge facilities may have to be built for recharge. Also, recharge will require aquifer discharge permits from ADEQ. At this time no estimate of the amount of effluent is available.

Poor Quality Groundwater Within AMAs

Contaminated Groundwater. Within the AMAs, elevated concentrations of hazardous substances such as volatile organic compounds, petroleum hydrocarbons, nitrogen fertilizers or pesticides makes large volumes of groundwater unsuitable for use for potable purposes. ADEQ has many active projects to remediate these water supplies. Although the groundwater cannot be used for domestic deliveries unless treated, it is still considered a groundwater resource that must be conserved and managed by ADWR. Within its management plans, ADWR describes the policies that are used to create incentives for the

treatment of the groundwater and also for the use of the water. ADWR encourages re-injection of the treated water, beneficial use of the treated water or other means to reduce the negative impact of the withdrawal, treatment and disposal of the groundwater on the achievement of the goal of the AMAs.

The ADWR policies that discourage long-term depletion of the groundwater supply within the AMAs will constrain the use of this supply by the AWBA or the CAP.

Waterlogged Areas in the Phoenix AMA. In the southwestern section of the Phoenix AMA, in the vicinity of the Buckeye Water Conservation and Drainage District, the St. Johns' Irrigation District, and the Arlington Canal Company, the water table is extremely shallow. This area collects the natural drainage from the Salt, Gila and Agua Fria Rivers, excess irrigation water and canal seepage from the irrigation districts, and discharges from the 91st and 23d Avenue waste water treatment plants. In some cases the depth to groundwater is less than 10 feet to water even though the districts operate wells to drain the area for irrigated crops. High salinity is present in the waterlogged area in the soil and groundwater. The water logging and salinity problems will continue as long as agriculture and wastewater discharges continue. The average drainage operations reported by ADWR are 12,000 to 15,000 acre-feet per year.

The drainage water is not subject to ADWR conservation requirements, nor payment of groundwater withdrawal fees. The water would have to be collected, treated and transported to a site away from the river for recharge.

Ocean Desalinization

In recent years, desalination has re-emerged as a viable water supply source. The California Department of Water Resources reports that in the late 1980s, during a period of extended drought, several localities in California either considered or built desalination facilities along the California coast. But with the end of the drought in the early 1990s, the high cost of desalinated water could not be justified for many of these localities and some closed their desalination facilities. By the late 1990s, however, desalination received renewed interest as demands for water supply mounted and improvements in technology reduced the cost of desalination significantly. In 2003, California DWR convened a task force to look at the feasibility of desalination for its state.

In its report, California DWR reports that potential for the increased use of desalination is significant. The opportunities are great for providing water supply from seawater and brackish water desalination as well as recovering contaminated groundwater. Although desalination will contribute less than 10 percent of the total water supply needs in California, the California DWR states that the desalinated water represents a significant portion of the State's drought proof water supply portfolio. Desalinated water, though expensive and energy intensive, is a secure water supply, not subject to drought.

If the AWBA or the CAP pursues ocean desalination, Arizona or its water agencies would need cooperative arrangements to access the coastlines of California. Water produced at

potential California sites would then be exchanged with the Metropolitan Water District or SDCWA for Colorado River Water.

Other potential sites for desalinization plants are along the Mexican coasts. The water might be transported directly to U.S. Colorado River contractors in the Yuma Area if a plant is located in the Gulf of California. Colorado River water could then be exchanged to make delivery of the water to the CAP or others. Or, if a plant is located on the Pacific Coast, product water could be transported north to the U.S. to exchange for Colorado River water, or perhaps to Tijuana to exchange with Mexico's Colorado River water.

In addition to cost consideration, ocean desalinization is a long-term proposition that involves interstate and international agreements. Start-up for such an endeavor may easily take more than 10 years, placing the water supply beyond the proposed planning period for acquisition of water during the next decade by the AWBA and the CAGR.