



# Joint Recovery Plan Overview

ADWR, AWBA & CAP

Tucson GUAC  
**April 21, 2014**

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“Effective planning and coordination among AWBA, ADWR, CAP, CAP customers, recovery partners and others are essential to successful recovery...”

*-Recovery of Water Stored by the Arizona Water Banking Authority: A Joint Plan by AWBA, ADWR and CAP. January 2014 Draft, page 5.*

# Status of Plan

- Draft version was made public on January 23<sup>rd</sup>
- CAWCD, ADWR & AWBA hosted a joint public workshop on February 4<sup>th</sup>
- Public comment ended on March 7<sup>th</sup>
- 5 formal comment letters received
- Interagency group reviewed the comments and where appropriate modified the Plan (final draft on CAP's website)

## Status (continued)

- AWBA voted to formally acknowledge the Plan by signing a Preface that acknowledges that Plan advances objectives in IGA
- CAWCD board will be asked to make a similar Recommendation at the May 1<sup>st</sup> Board Meeting (Holiday Inn – Casa Grande)

# Today's Focus

- Overview of Plan
- Questions & Comments



# Section 1: Background, Purpose & Scope

- Issue Background
- Planning Process
- Purpose and Scope



# Section 1: Background, Purpose & Scope

Includes recovery of the AWBA's credits :

- To firm **CAP M&I priority subcontractors** and **P-4 on-River M&I** users during shortage
- To meet the **State's obligations to firm up to 23,724 AF of NIA** priority CAP pursuant to **Indian** water rights settlements
- To meet **interstate** water banking obligations with **Nevada**



# Section 1: Background, Purpose & Scope

- Clarify roles of the primary entities
- Analyze and project likelihood, timing & magnitude of potential recovery (out to 2045)
- Establish planning-level certainty
- Identify potential recovery partnerships and opportunities
- Identify key recovery decision points and actions within the planning horizon



## Section 2: Roles and Responsibilities

- AWBA
- CAP
- ADWR
- Reclamation
- CAP's Recovery Partners
- Beneficiaries
- Other Interested Parties



## Section 3: Funding, Purpose, & Location of Credits

- AWBA has accrued 3.8 million AF of credits through 2012
- Several factors determine where recovery of these credits will occur
  - Funding
  - Statutory Purposes
  - Location

# Credits By AMA & Funding

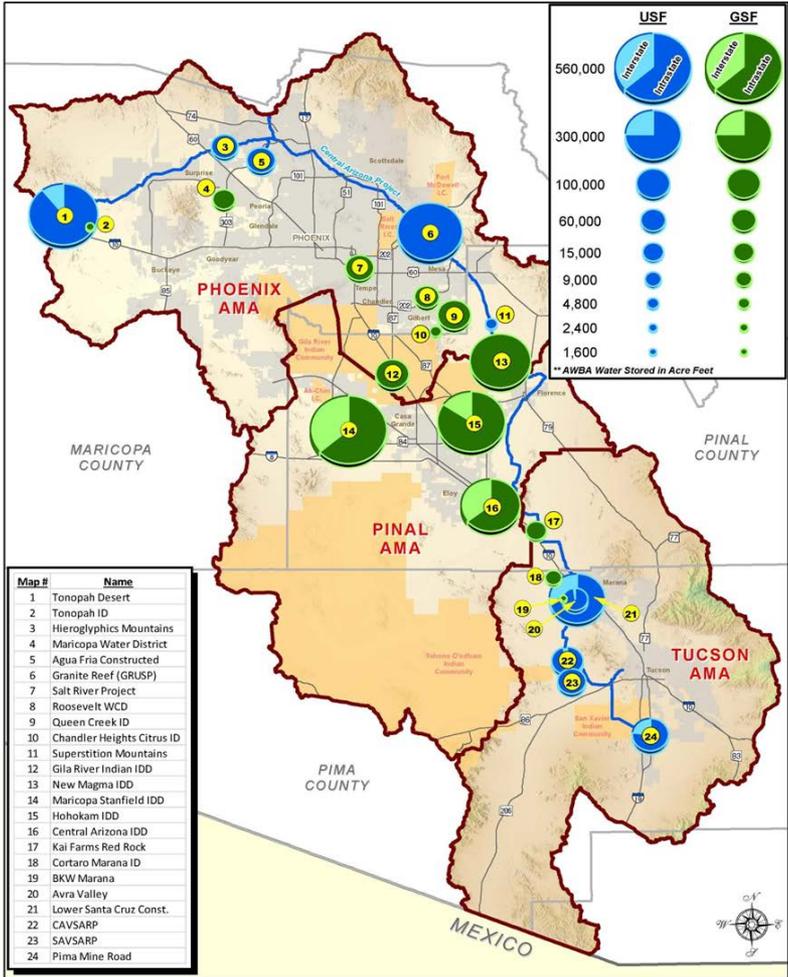
**Table 1** AWBA Credits Accrued through 2012, by AMA and Funding Source (AF)

Funding Source	Phoenix AMA	Pinal AMA	Tucson AMA	Total
4-Cent Ad Valorem Tax <sup>1</sup>	1,329,925	187,465	390,334	1,907,724
Withdrawal Fees	293,632	394,896	98,788	787,316
General Fund	42,316	306,968	54,546	403,830
Other Intrastate:				
Indian Firming Appropriation	-	-	28,481	28,481
Shortage Reparation	20,642	60,507	1,227	82,376
GSF Operator Full Cost Share <sup>2</sup>	-	14,125	-	14,125
Intrastate TOTAL	1,686,514	963,961	573,376	3,223,851
Interstate - Nevada	51,009	439,851	109,791	600,651
<b>TOTAL</b>	<b>1,737,523</b>	<b>1,403,812</b>	<b>683,167</b>	<b>3,824,502</b>

# Statutory Purposes

FUNDING SOURCE	Firming M&I CAP	Firming On-River M&I (P-4 )	Firming Indian Settlements (NIA)	Fulfilling Water Management Objectives
Ad Valorem Taxes	X			
Groundwater Withdrawal Fees	X		X	X
General Fund	X	X	X	X
Shortage Reparations	X	X	X	X

# Location of Credits



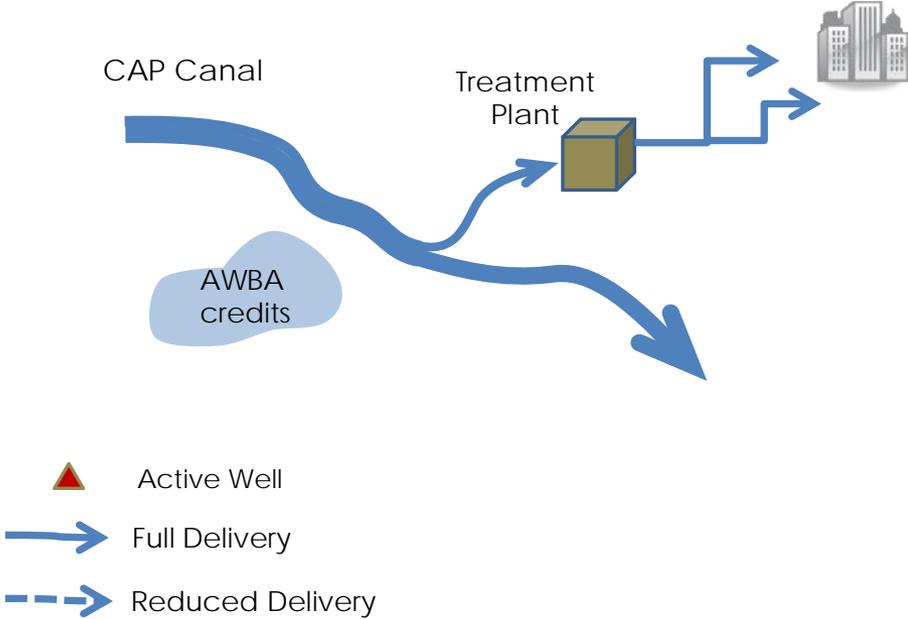
## Section 4: Methods & Costs

- Defines and illustrates basic recovery methods
  - Direct
  - Indirect
  - Credit Exchange
- Provides a general cost comparison of the methods

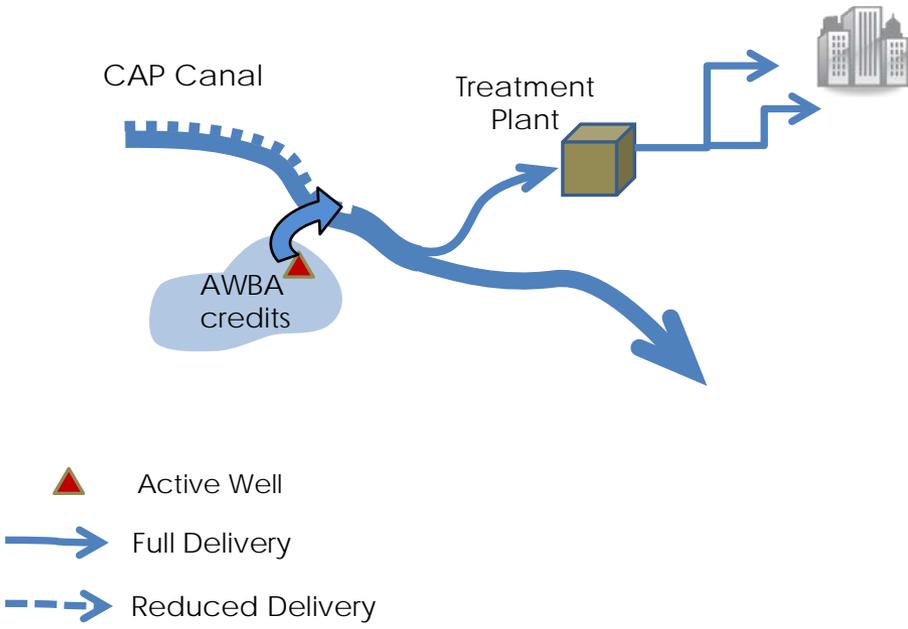
# Differences among Methods

	Direct Recovery	Indirect Recovery	Credit Exchange
Water into CAP system	Yes	No	No
Additional Pumping & Energy required	Yes	Yes	No

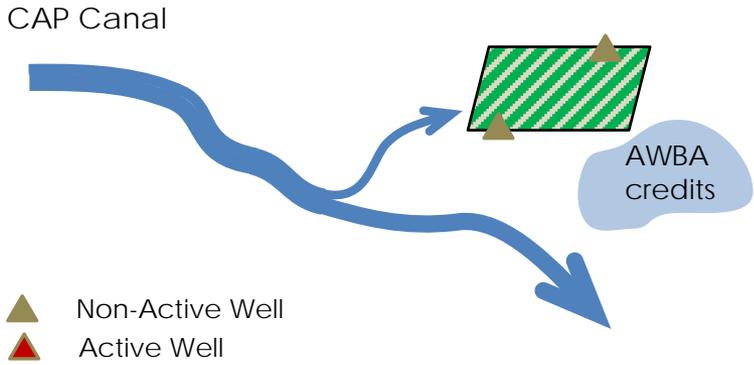
# Normal Conditions



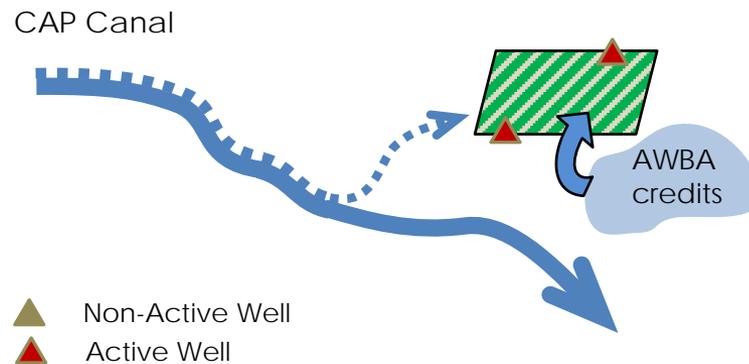
# Direct Recovery



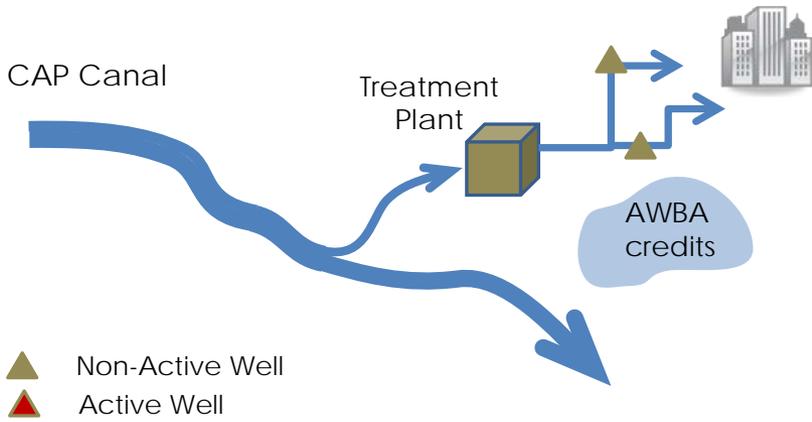
# Normal Conditions



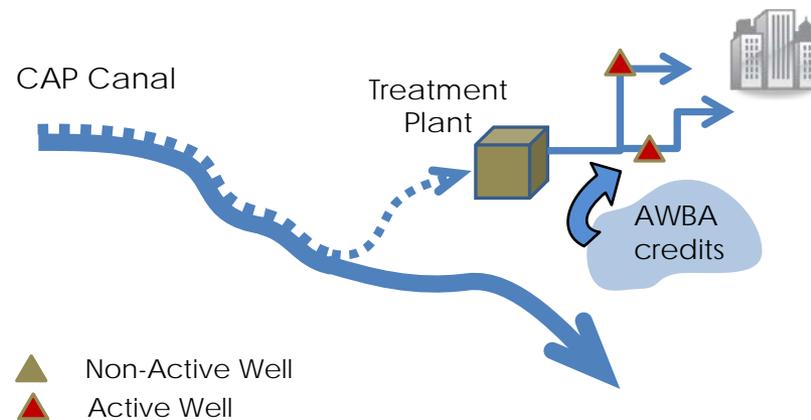
# Indirect Recovery, Ag Pool



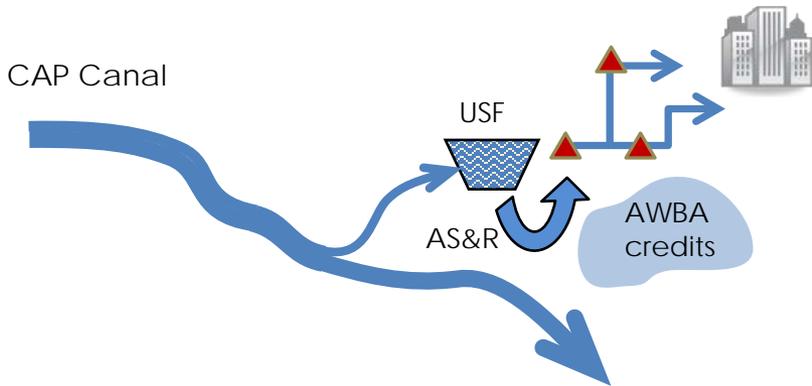
# Normal Conditions



# Indirect Recovery, Municipal

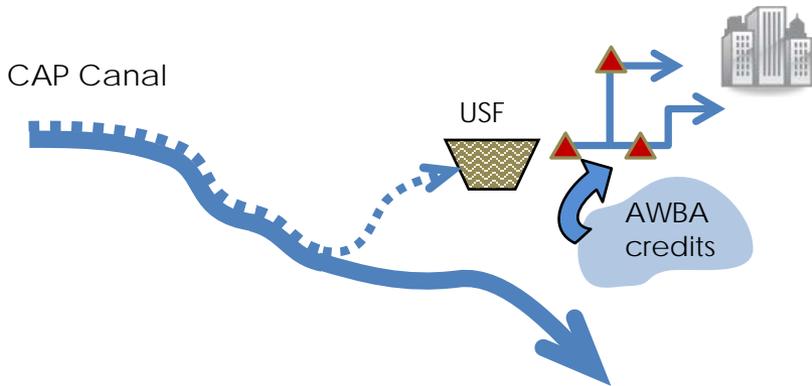


# Normal Conditions



- ▲ Active Well
- ▤ USF, Full Delivery
- ▤ USF, Reduced Delivery

# Credit Exchange



-  Active Well
-  USF, Full Delivery
-  USF, Reduced Delivery

# Cost Components

- Direct
  - Capital costs, energy, O&M
- Indirect
  - Energy, O&M
  - Average cost \$60/acre-foot (California)
- Credit Exchange
  - No additional pumping or O&M



## Section 5: Likelihood, Timing & Magnitude of Recovery

- Factors Affecting Recovery
- Modeling Approach
- Synthesizing Results



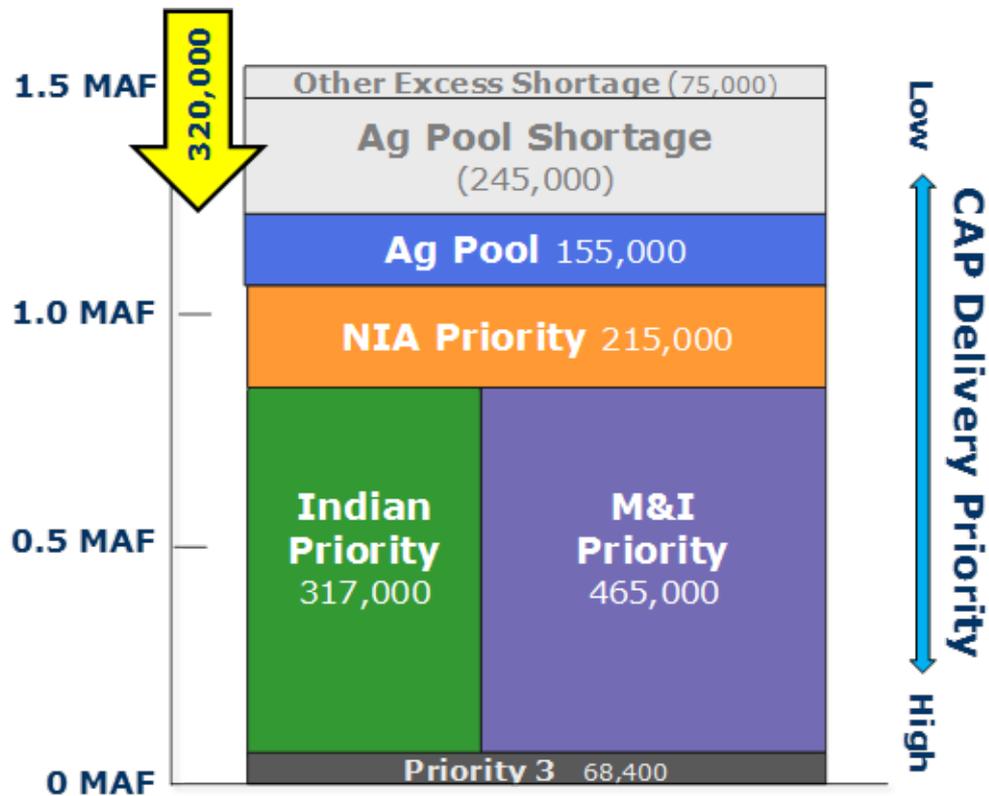
## Section 5: Likelihood, Timing & Magnitude of Recovery

- **Factors affecting Recovery**
  - Shortage
  - Non-shortage

# Shortage Factors

- Recovery of AWBA credits will be required when the reduction in Arizona's Colorado River **supply** intersects **deliveries** to users(CAP and On-River) **for which the AWBA has firming goals** or obligations

# Example - 2016 Tier 1 Shortage



# Non-Shortage Factors

- Outage on the CAP system (outside scope of this Plan)
- Interstate ICUA Requests
  - Rate of Nevada's municipal growth

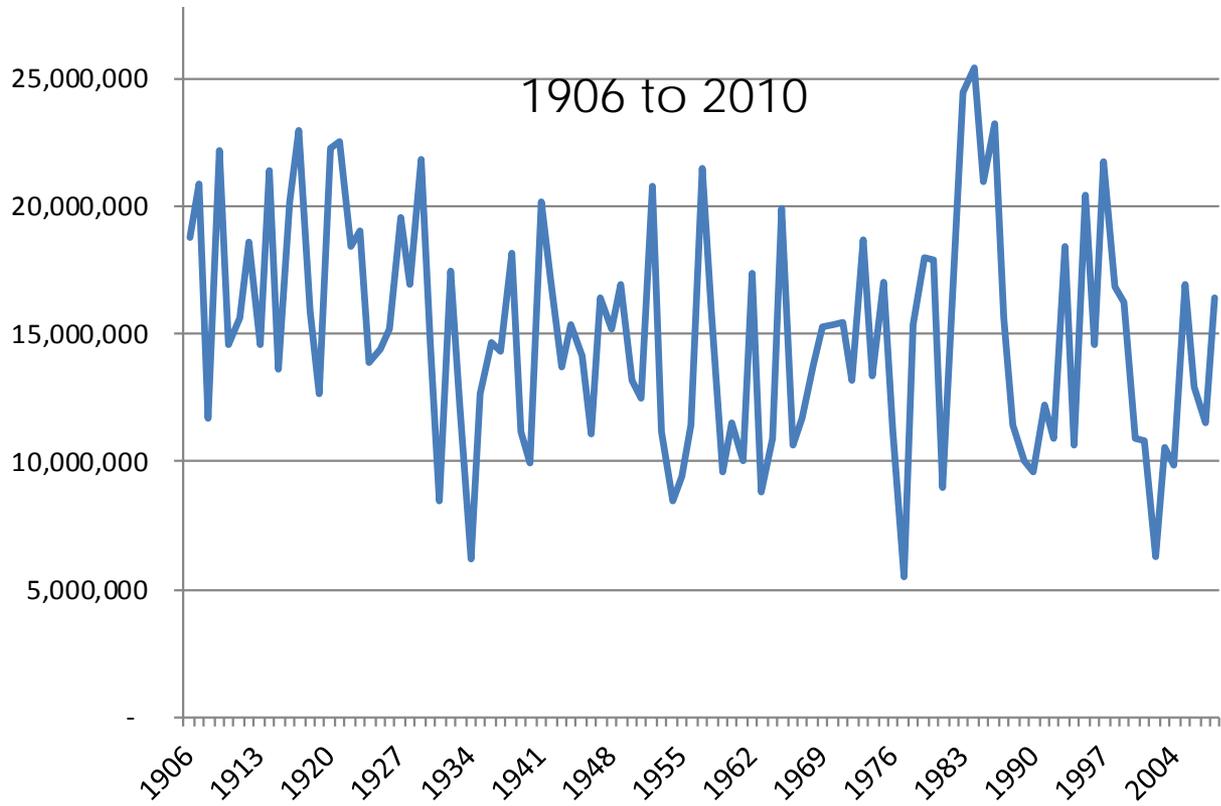
# Modeling

- Analysis of recovery factors requires use of models
- The Joint Plan relies on two models
  - Reclamation's Colorado River Simulation System (CRSS)
  - Custom recovery model that matches traces from CRSS against a range of supply and demand conditions

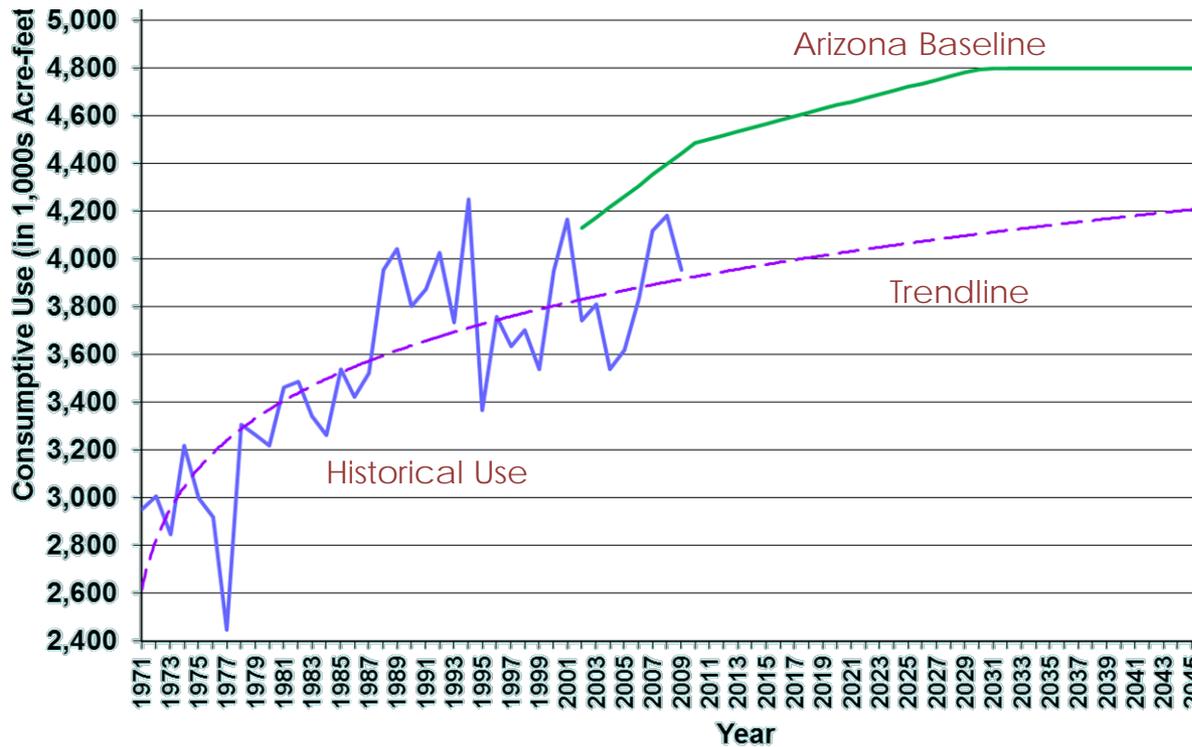
# CRSS Modeling Assumptions

<b>"Arizona Baseline"</b>	
<b>Modeling Parameters</b>	<b>Modeling Assumptions</b>
<b>Basin Hydrology</b>	Observed Record (1906-2010)
<b>Upper Basin Demands</b>	ADWR Upper Basin Demand Assumption - 4.8 MAF by 2031, then flat
<b>Operation of Yuma Desalting Plant</b>	No
<b>Mexico Shortage Sharing</b>	Yes, Minute 319, extended
<b>Reservoir Operations</b>	2007 Interim Guidelines, extended
<b>Initial Reservoir Condition</b>	2014 Lake Mead elevation

# Basin Hydrology



# Upper Basin Demands



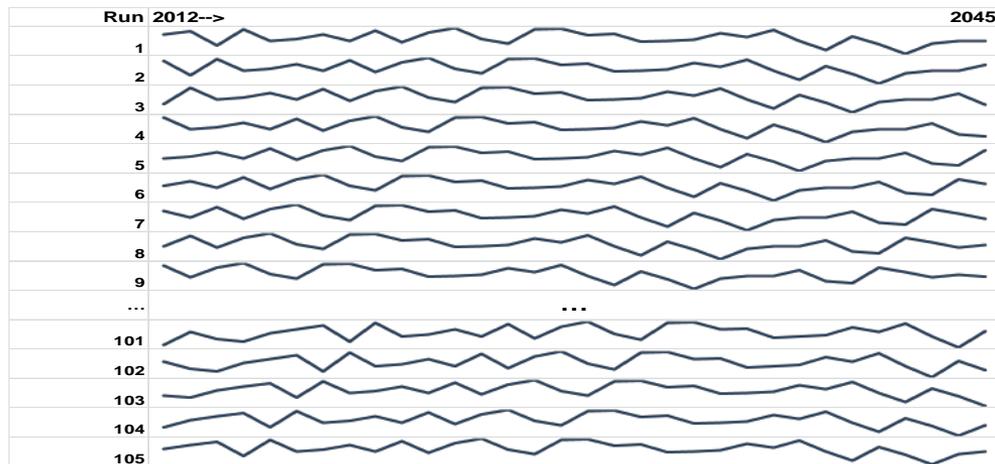
# Reservoir Operations

Interim Guidelines (2007) and Minute 319

Shortage Tier	January 1 Elevation of Lake Mead	Delivery Reductions During Shortage (AF)		
		Nevada	Mexico	Arizona
Tier 1	1075' to 1050'	13,000	50,000	<b>320,000</b>
Tier 2	<1050' to 1025'	17,000	70,000	<b>400,000</b>
Tier 3	<1025' to 1000'	20,000	125,000	<b>480,000</b>
Tier 3+	below 1000'	<i>Basin States must consult (consultation triggered once Lake Mead drops below 1025')</i>		

# Recovery Model

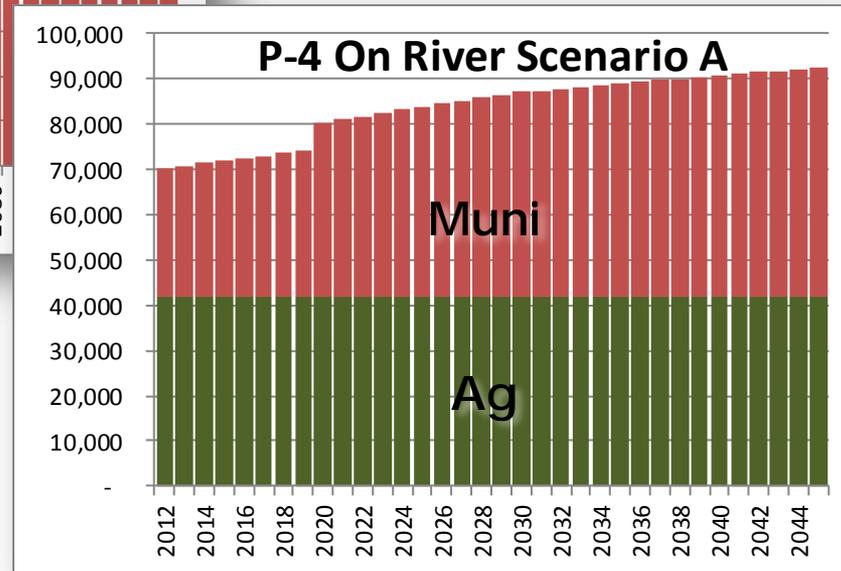
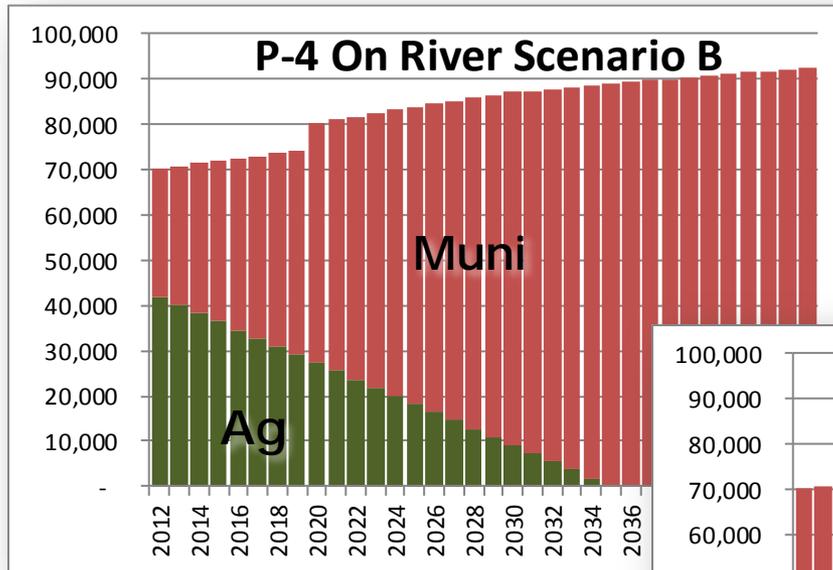
- The recovery model incorporates the 105 different water supply traces from the CRSS model and matches those against a range of projected on-River and CAP demands.



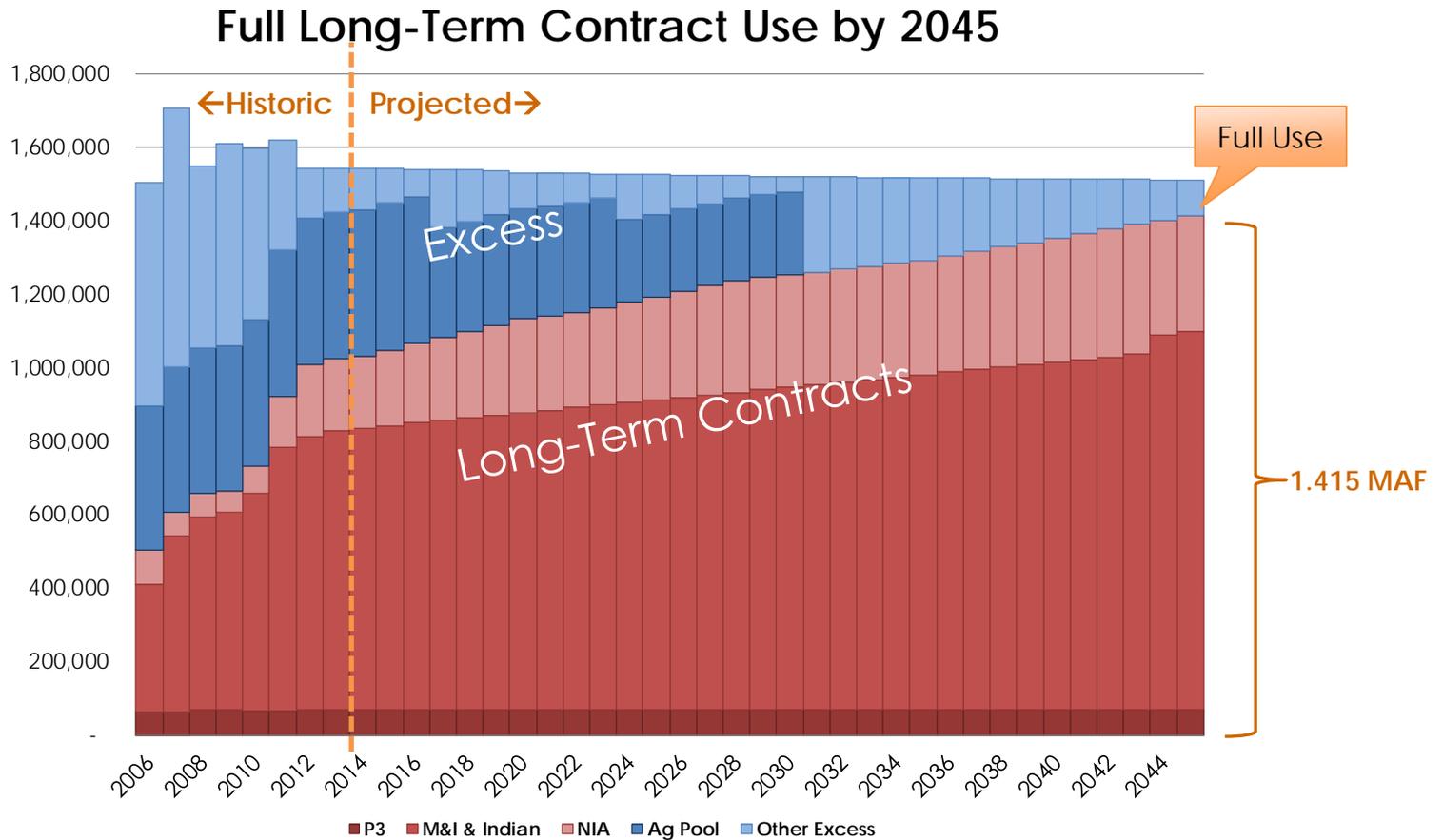
# On-River Demand



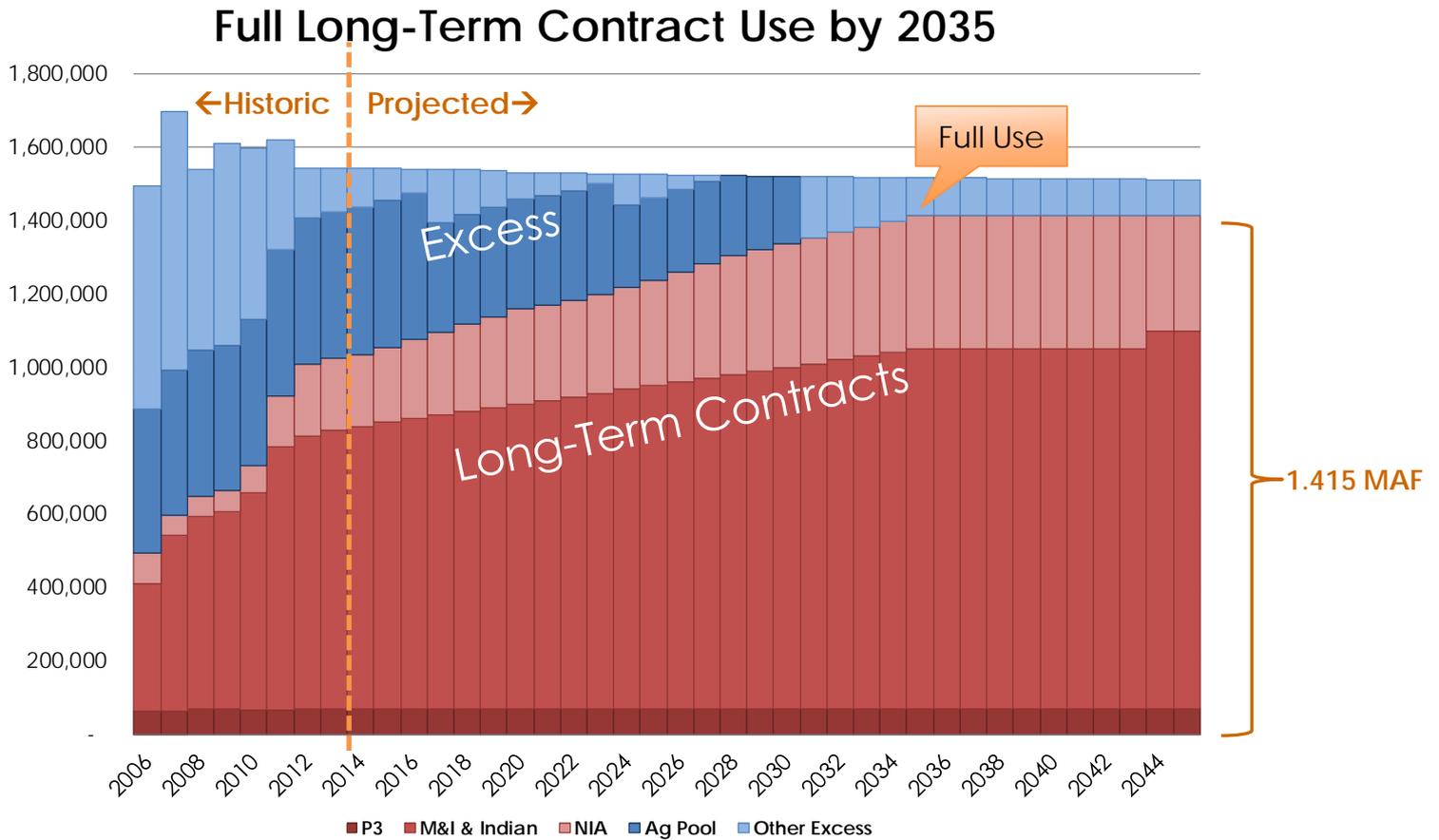
# On-River P-4 Demand



# CAP Demand



# CAP Demand



# Scenarios

Scenarios	Intrastate Assumptions		Interstate Assumptions
	On-River Demand	CAP Demand	Nevada Request
<b>Scenario A</b>	Increase to 1.22 MAF by 2045; no conversion of P-4 agricultural use  (ADWR's Scenario A for NIA reallocation)	Full long-term contract use by 2045	<b>Early Steady:</b> Start in 2025; steady to 2063 (~15 kAF/yr); no shortage request
			<b>Later Steady:</b> Start in 2035; steady to 2063 (~21 kAF/yr); no shortage request
<b>Scenario B</b>	Increase to 1.22 MAF by 2045; full conversion of P-4 agricultural use to M&I by 2035	Full long-term contract use by 2035	<b>Early Max:</b> Start in 2025; max request; additional shortage request
			<b>Later Max:</b> Start in 2035; max request; additional shortage request

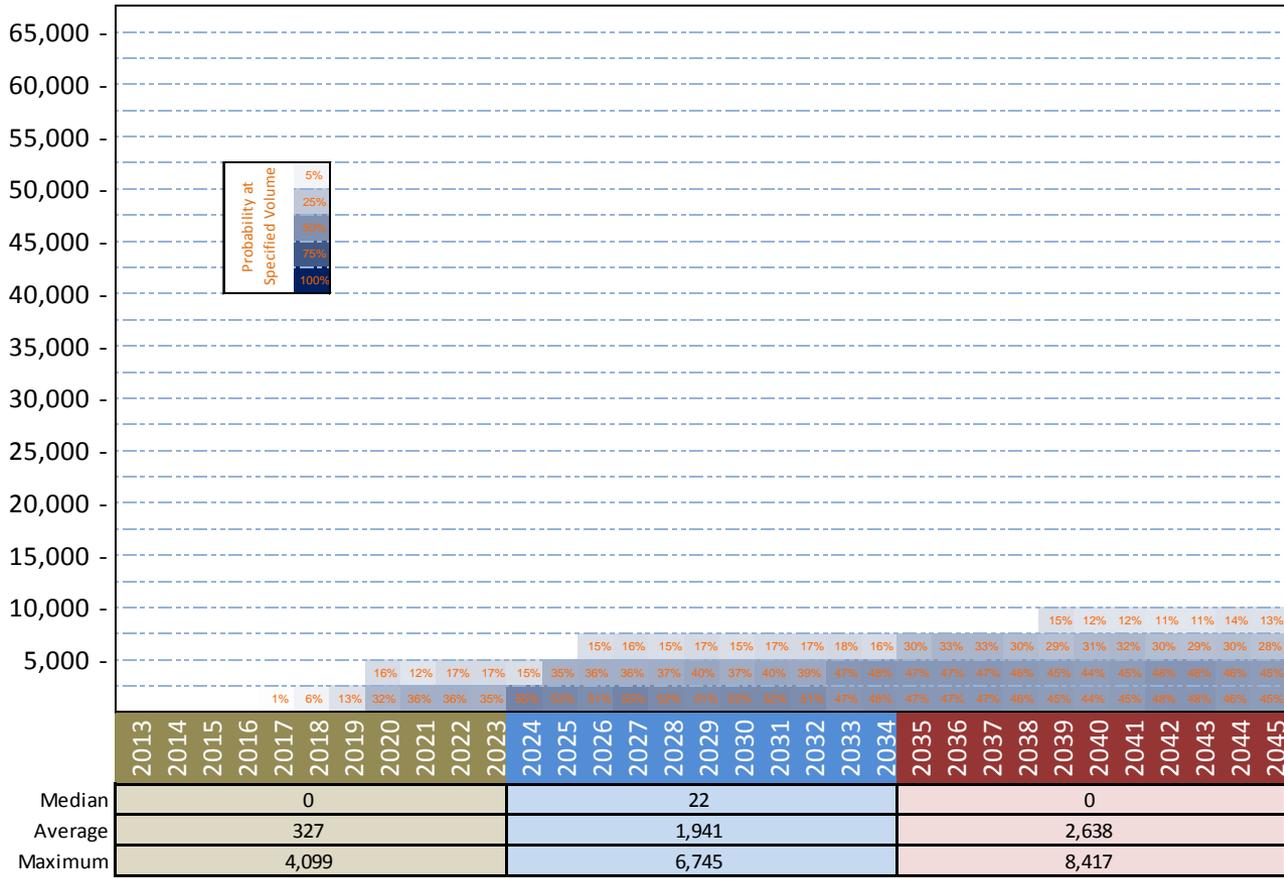


# Scenario A

## Recovery for On-River P4

CRSS: 9/13 Run, AZ Assumptions; On-River: ADWR NIA "A", No Ag Convert

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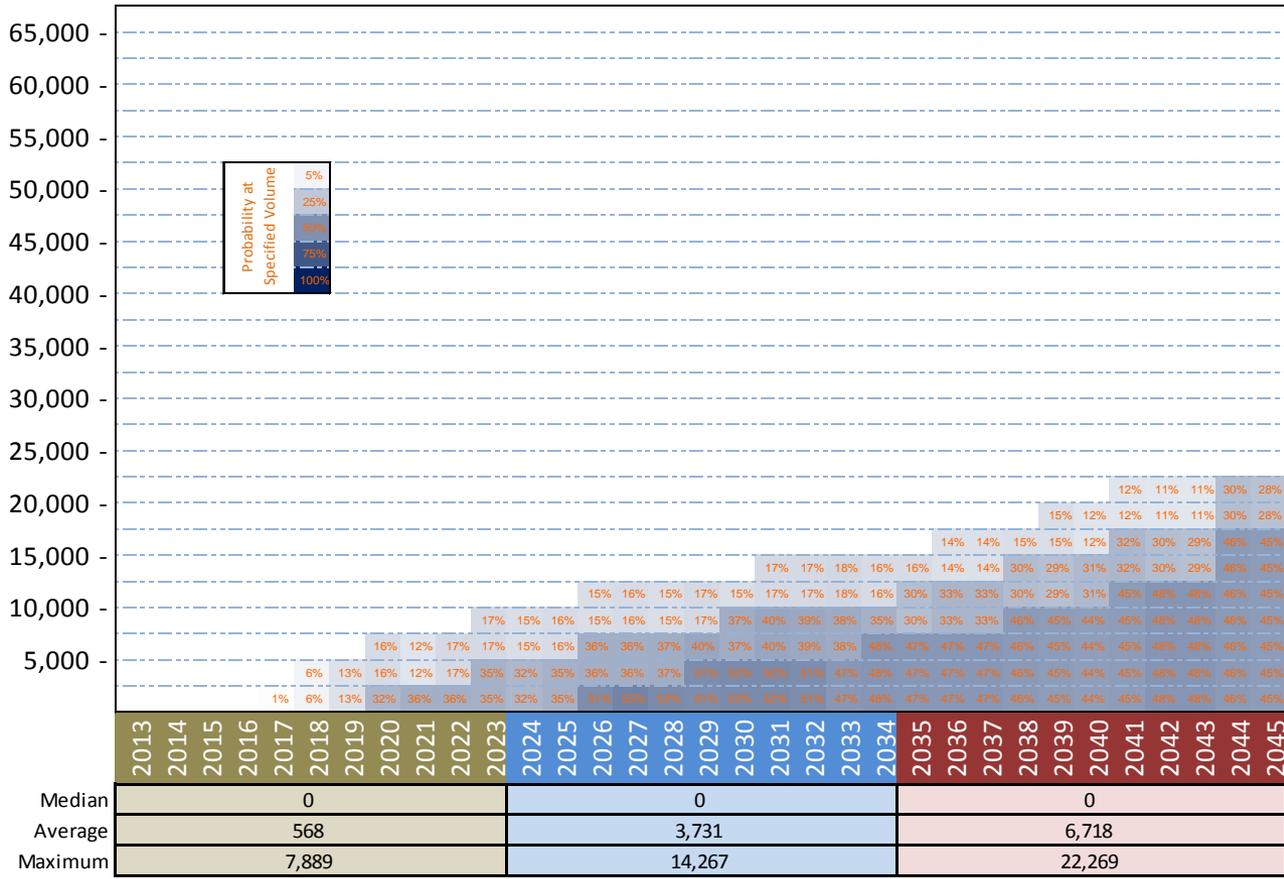


# Scenario A

## Recovery for Indian NIA

CRSS: 9/13 Run, AZ Assumptions; On-River: ADWR NIA "A"; Long-Term  
Contracts: Full by 2045

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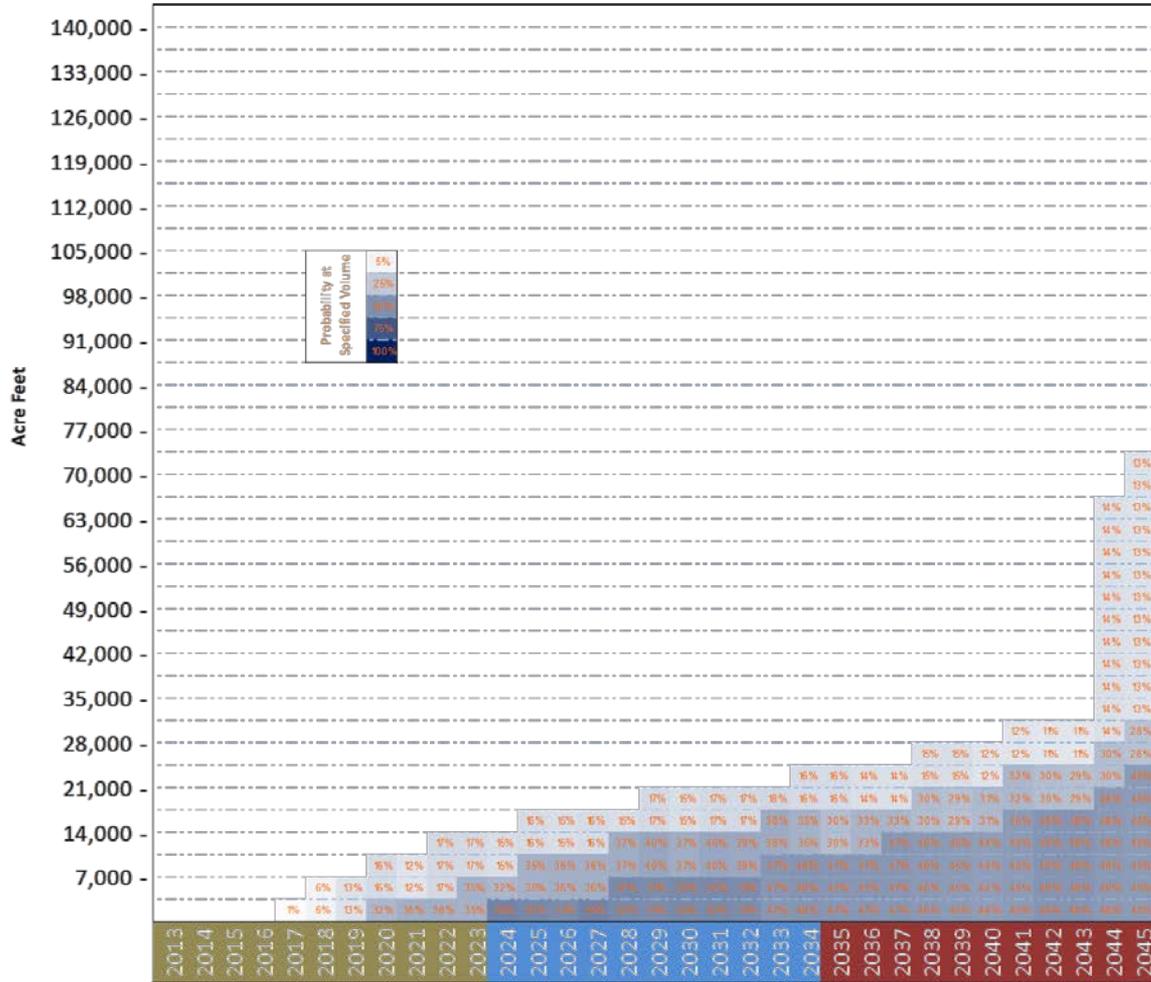


# Scenario A

## TOTAL Recovery

CRSS: 9/13 Run, AZ Assumptions; Nevada: No Request, No Short; On-River: ADWR NIA "A", No Ag Convert; Long-Term Contracts: Full by 2045

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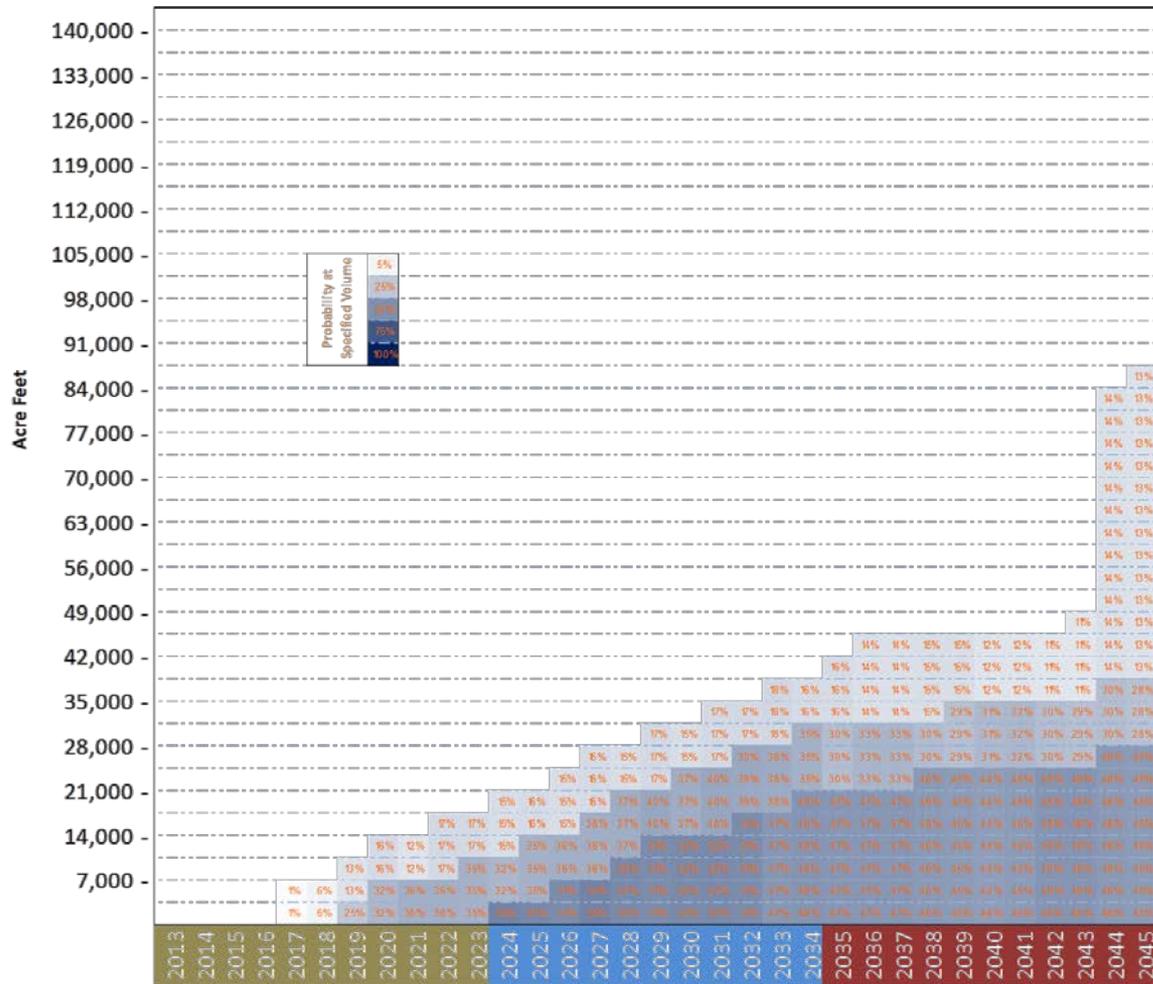


# Scenario B

## TOTAL Recovery

CRSS: 9/13 Run, AZ Assumptions; Nevada: No Request, No Short; On-River: ADWR NIA "A", Full Ag Convert by 2035; Long-Term Contracts: Full by 2035

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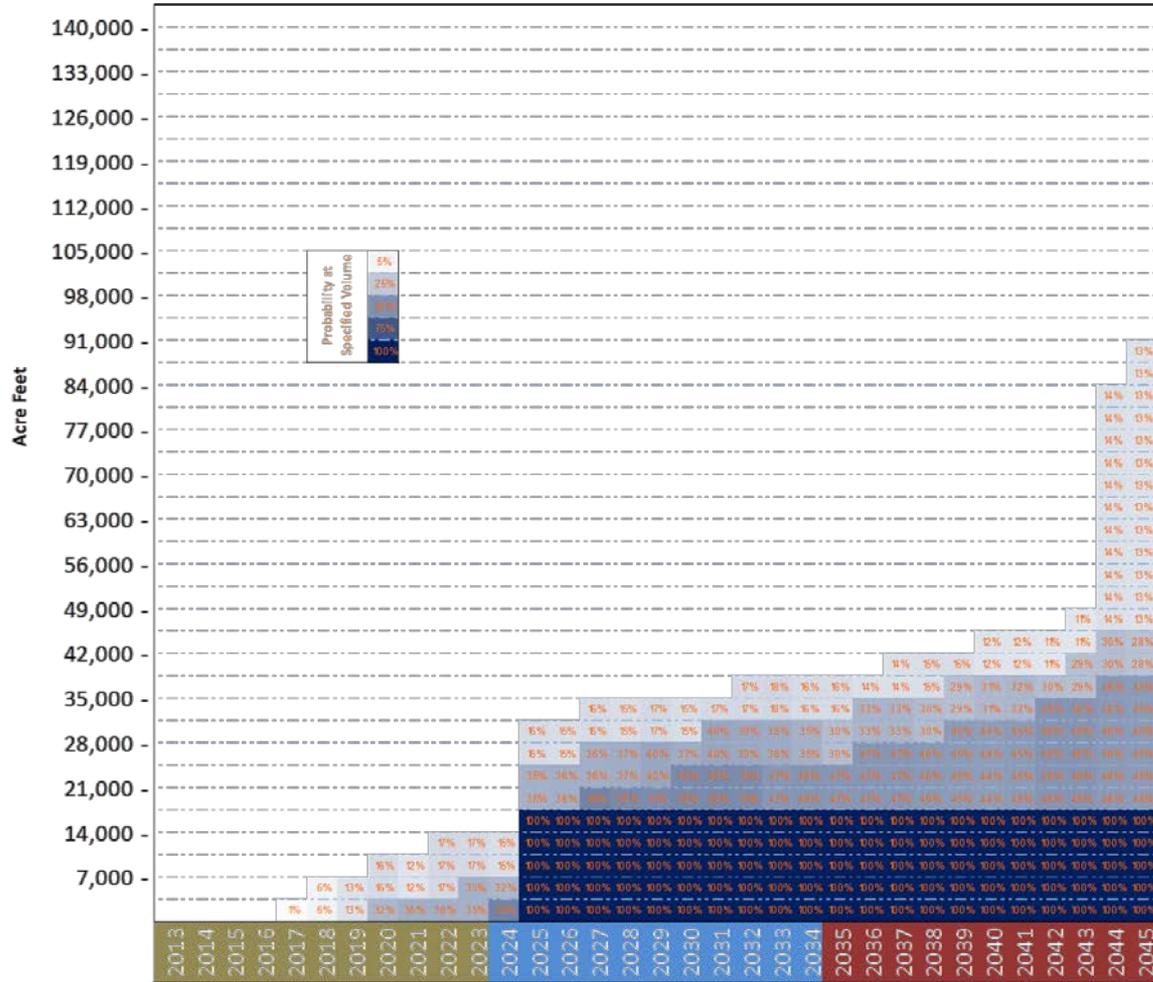


# Scenario A1

## TOTAL Recovery

CRSS: 9/13 Run, AZ Assumptions; Nevada: Steady Request, 2025 to 2026, No Short; On-River: ADWR NIA "A", No Ag Convert; Long-Term Contracts: Full by 2045

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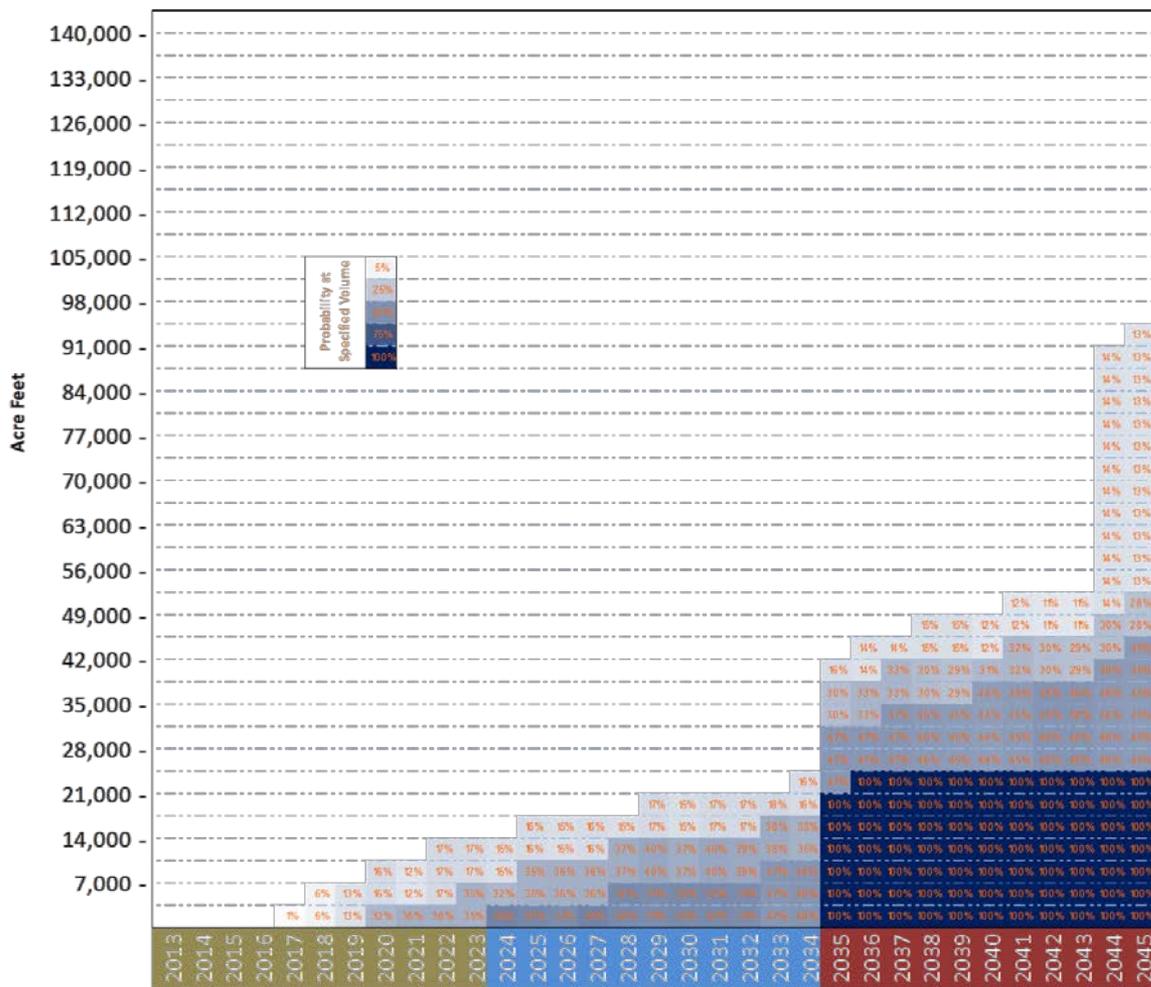


# Scenario A2

## TOTAL Recovery

CRSS: 9/13 Run, AZ Assumptions; Nevada: Steady Request, 2035 to 2063, No Short; On-River: ADWR NIA "A", No Ag Convert; Long-Term Contracts: Full by 2045

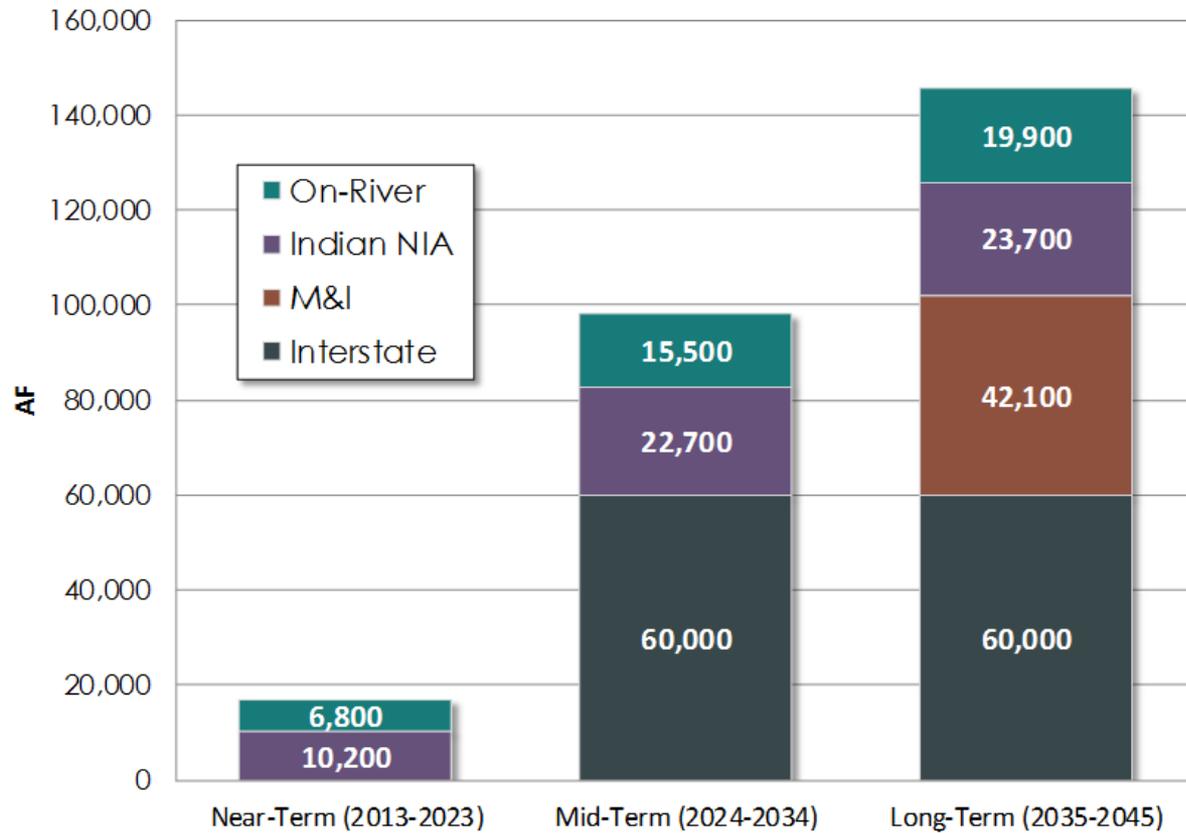
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## Maximum Projected Recovery by Type



# Summary of Results

- Earliest projected intrastate recovery is 2017 (1% probability; Indian NIA and On-River)
- No M&I recovery projected until Long-Term planning period (2035-2045)
- Timing and magnitude of Nevada's request plays significant role in Mid-Term and Long-Term planning periods



## Section 6: Credit Requests, Distribution & Opportunities

Section applies the results of the modeling to the AMA level, by addressing:

- Future Credit Requests by CAP
- Credit Distribution by the AWBA
- Potential Recovery Opportunities by AMA

# Credit Requests & Distribution

## AWBA Funding Sources & Allowable Uses

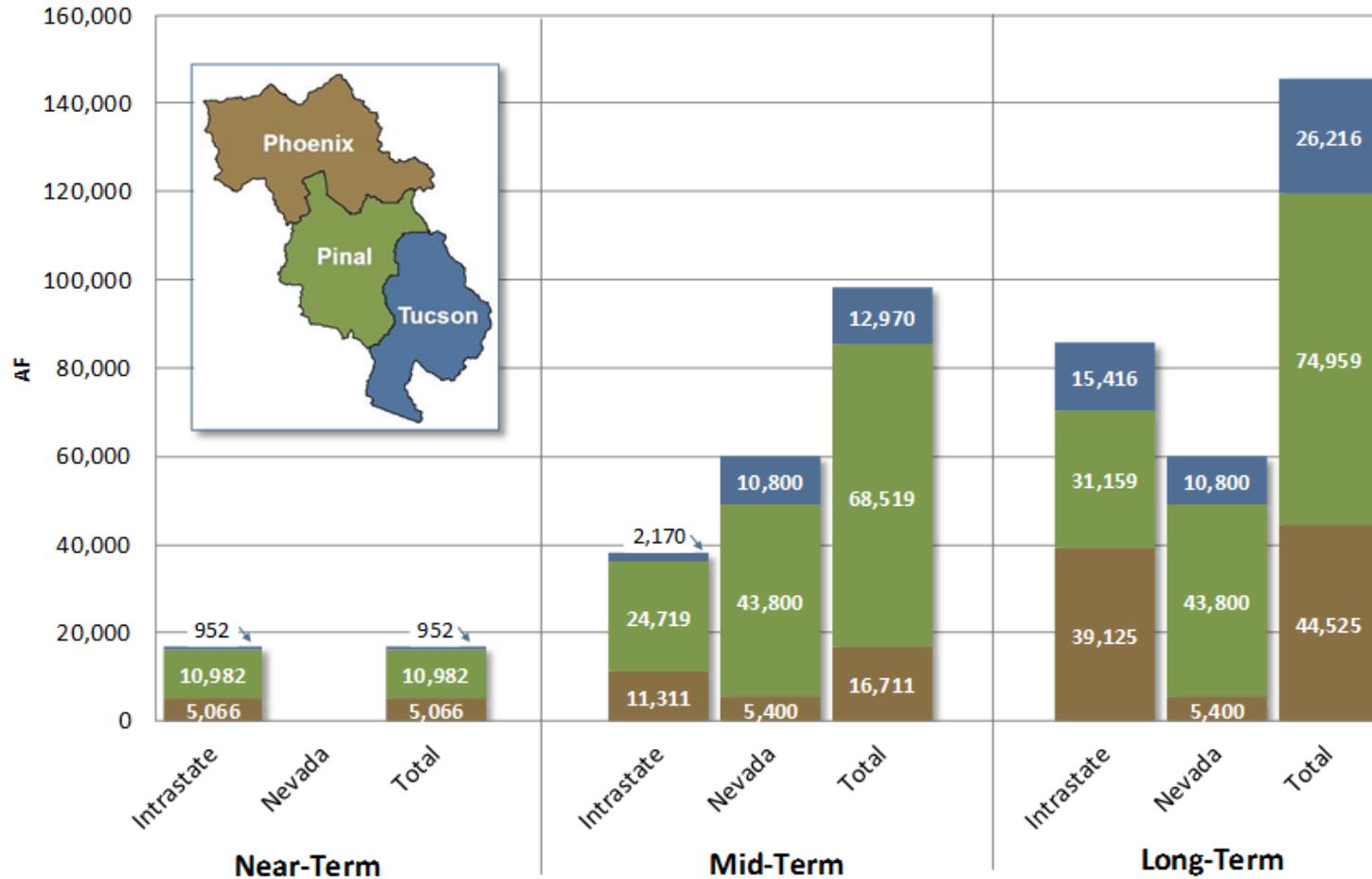
FUNDING SOURCE	Firming M&I CAP	Firming On-River M&I (P-4 )	Firming Indian Settlements (NIA)	Fulfilling Water Management Objectives
Ad Valorem Taxes	X			
Groundwater Withdrawal Fees	X		X	X
General Fund	X	X	X	X
Shortage Reparations	X	X	X	X

# Credit Requests & Distribution

## Storage by Fund

Acre-feet		PHOENIX	PINAL	TUCSON	
1,907,724	Ad Valorem	70%	10%	20%	
787,316	Withdrawal Fee	37%	50%	13%	
403,830	General Fund	10%	76%	14%	
82,376	Shortage Reparations	25%	73%	1%	
600,651	Interstate	8%	73%	18%	

## Example Annual Credit Request by AMA Based on Maximum Annual Projected Recovery



# Opportunities

- Primary recovery opportunities by AMA
- Makes general recommendations
- Opportunities vary based on CAP use

# Phoenix AMA

- Credit Exchange with the CAGR D
- Credit Exchange with Subcontractors performing ASR at USFs
- Indirect Recovery using third party recovery partners and regional water delivery systems
- Other opportunities

# Pinal AMA

- Indirect Recovery using Irrigation District wells and the Ag Pool
- Indirect Recovery using third party recovery partners and regional water conveyance systems
- Development of a direct recovery well field
- Partnering with potential USF developers to create credit exchange opportunities

# Tucson AMA

- Credit Exchange with Tucson Water performing ASR at Clearwater
- Credit Exchange with Metro Water performing ASR at Avra Valley USF
- Credit Exchange with the Town of Marana performing ASR at Lower Santa Cruz USF
- Other Opportunities

## Section 7: Implementation

- Operational Timeline
  - Before Recovery Year
  - During
  - After
- Collection of Recovery Costs
  - Beneficiaries pay
  - Terms of Agreements



## Section 8: Future Activities & Commitments

- Recovery Agreements
- Technical Studies & Future Project Feasibility
- Monitoring & Updating
- AWBA Activities



# Recovery web page

[www.cap-az.com](http://www.cap-az.com)

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planning/recovery

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# Questions & Comments