



# MPWG Industrial Subgroup Turf Breakout Meeting

October 24, 2019

# Agenda

- \* Overview of Existing Turf Conservation Programs
- \* Recommendations for the Remaining Fourth Management Plans Turf Conservation Programs
- \* Discussion of Development of Turf Conservation Programs for the Fifth Management Plans

# Overview of Existing Turf Conservation Programs



# Management Plans

A.R.S. § 45-563 (A)

*“The director shall develop a management plan for each initial active management area for each of five management periods... and shall adopt the plans only after public hearings... The plans shall include a continuing mandatory conservation program... designed to achieve reductions in withdrawals of groundwater.”*



# Statutory Requirements - Summary

A.R.S. § 45-564 et seq.	1MP	2MP	3MP	4MP	5MP
Calculate Water Duty	💧	💧	💧	💧	💧
Municipal GPCD Reduction	💧	💧	💧	💧	💧
Municipal Lost & Unaccounted for Water	💧	💧	💧	💧	💧
General Industrial Conservation	💧	💧	💧	💧	💧
Conservation for Untreated Providers		💧	💧	💧	💧
Conservation for Small Providers		💧	💧	💧	💧
Municipal Non-Per Capita Conservation		💧	💧	💧	💧
Incentives for Augmentation/Recharge		💧	💧	💧	💧
Assessment of Water Quality		💧	💧	💧	💧
Program for Conservation Assistance		💧	💧	💧	💧
Historical Natural Recharge		💧	💧	💧	💧
May Reduce Highest 25% of Water Duties			💧	💧	💧
Agricultural Historic Cropping Program			💧	💧	💧
Agricultural BMP Program			💧	💧	💧
Option for Alternative Agricultural Programs			💧	💧	💧
May Establish Cropped Acreage Program			💧	💧	💧
May Include Program for GFR Purchase & Retirement			💧	💧	💧
Recommendations to AWBA/for well locations			💧	💧	💧



# Industrial Conservation Program

A.R.S. § 45-566(A)(2)

*“For industrial uses, including industrial uses within the exterior boundaries of the service area of a city, town, private water company or irrigation district, the program in each plan shall require the use of or establish conservation requirements based on the use of the latest commercially available conservation technology consistent with reasonable economic return.”*



# Industrial Conservation Program

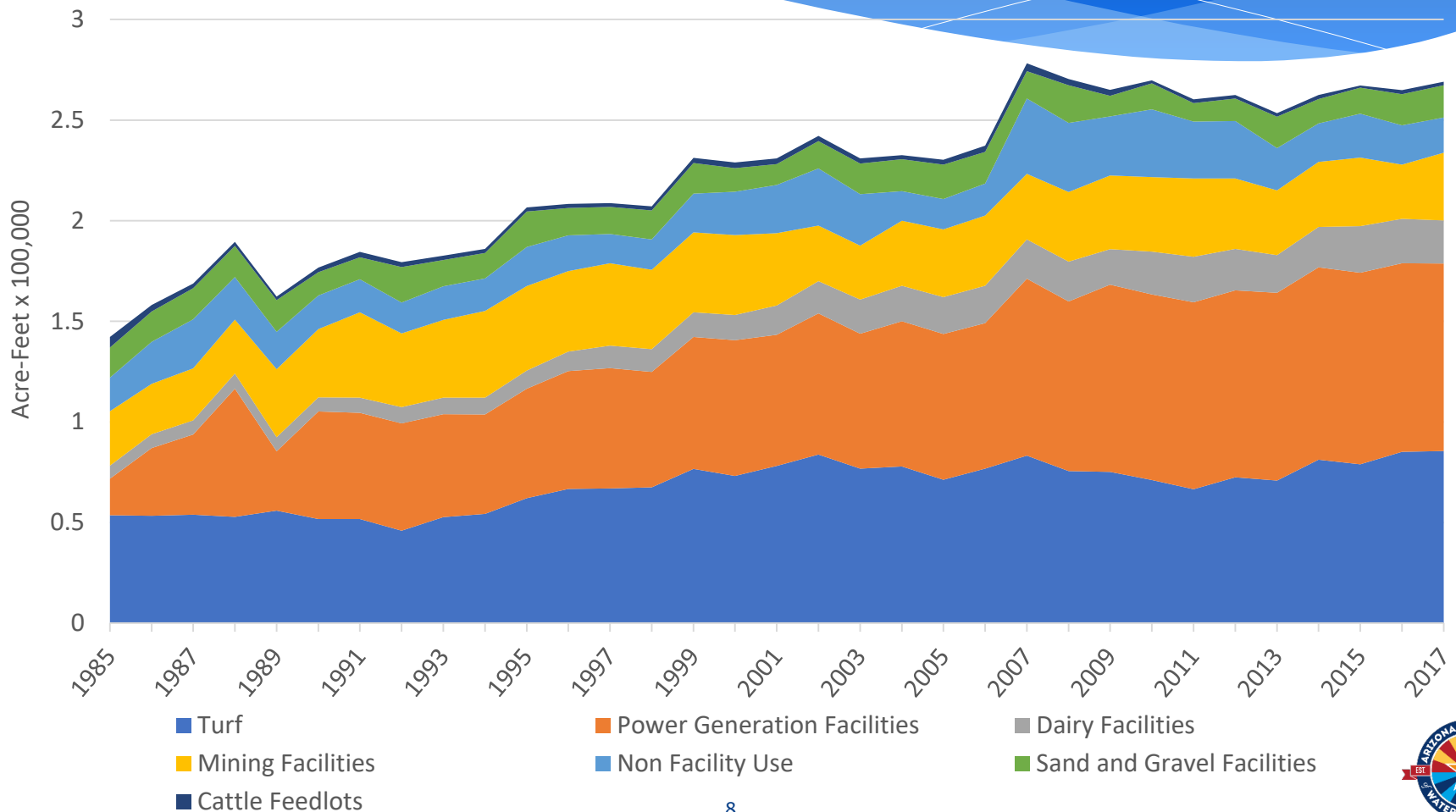
*A.R.S. § 45-563(A): “... The plans shall include a continuing mandatory conservation program for all persons withdrawing, distributing or receiving groundwater designed to achieve reductions in withdrawals of groundwater.”*

- \* Industrial Conservation Program
  - \* Chapter 6 in Management Plans
  - \* General Requirements
  - \* Specific Subsector Programs

- \* Conservation Programs include:
  - \* Regulatory requirements related to water use
  - \* Reporting requirements
  - \* Conservation targets
  - \* Flexibility provisions
  - \* Compliance provisions



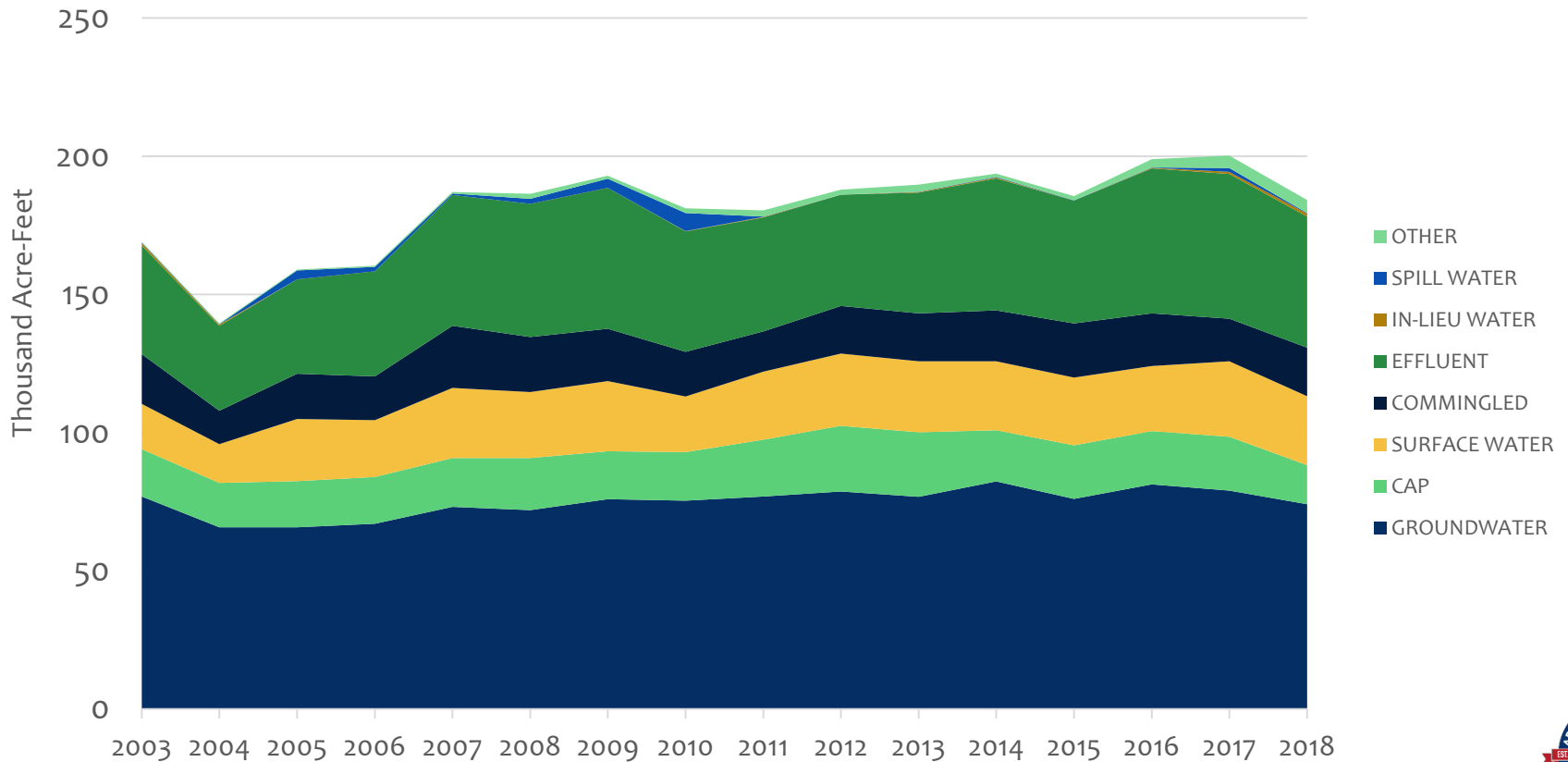
# Use by Subsector – All AMAs





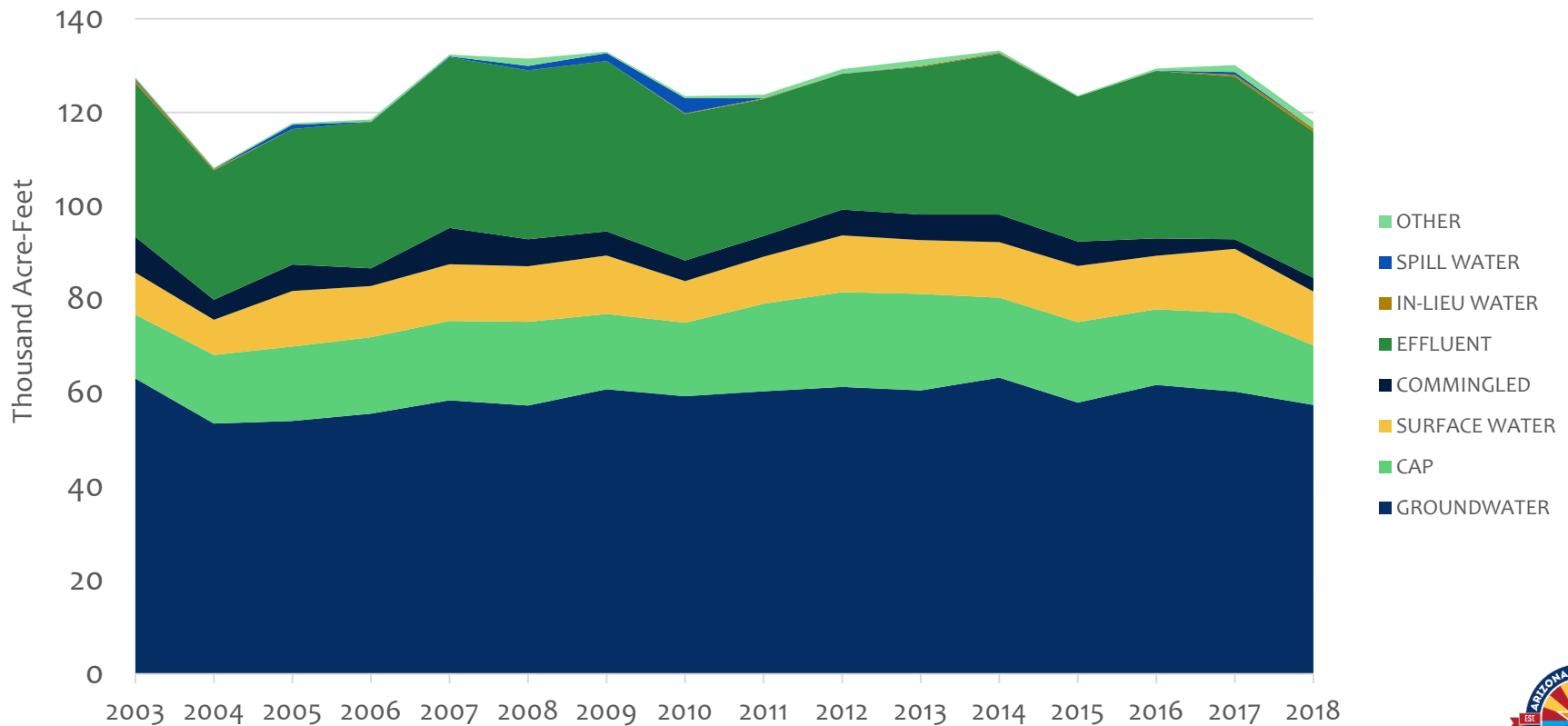
# Industrial Turf Program – Use By Water Source

All Turf Facility Use by Source



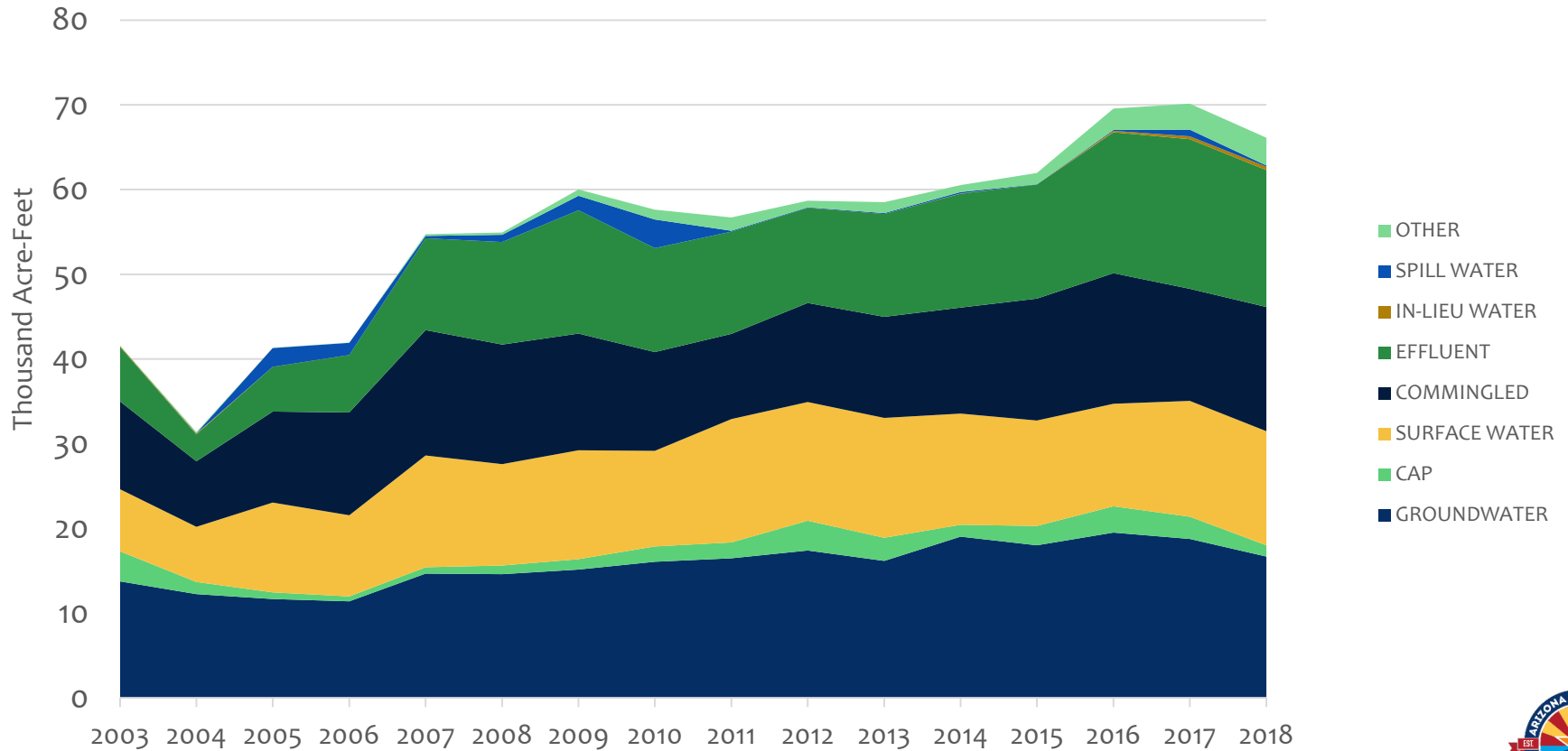
# Golf Course Use by Source

Golf Course Use by Source

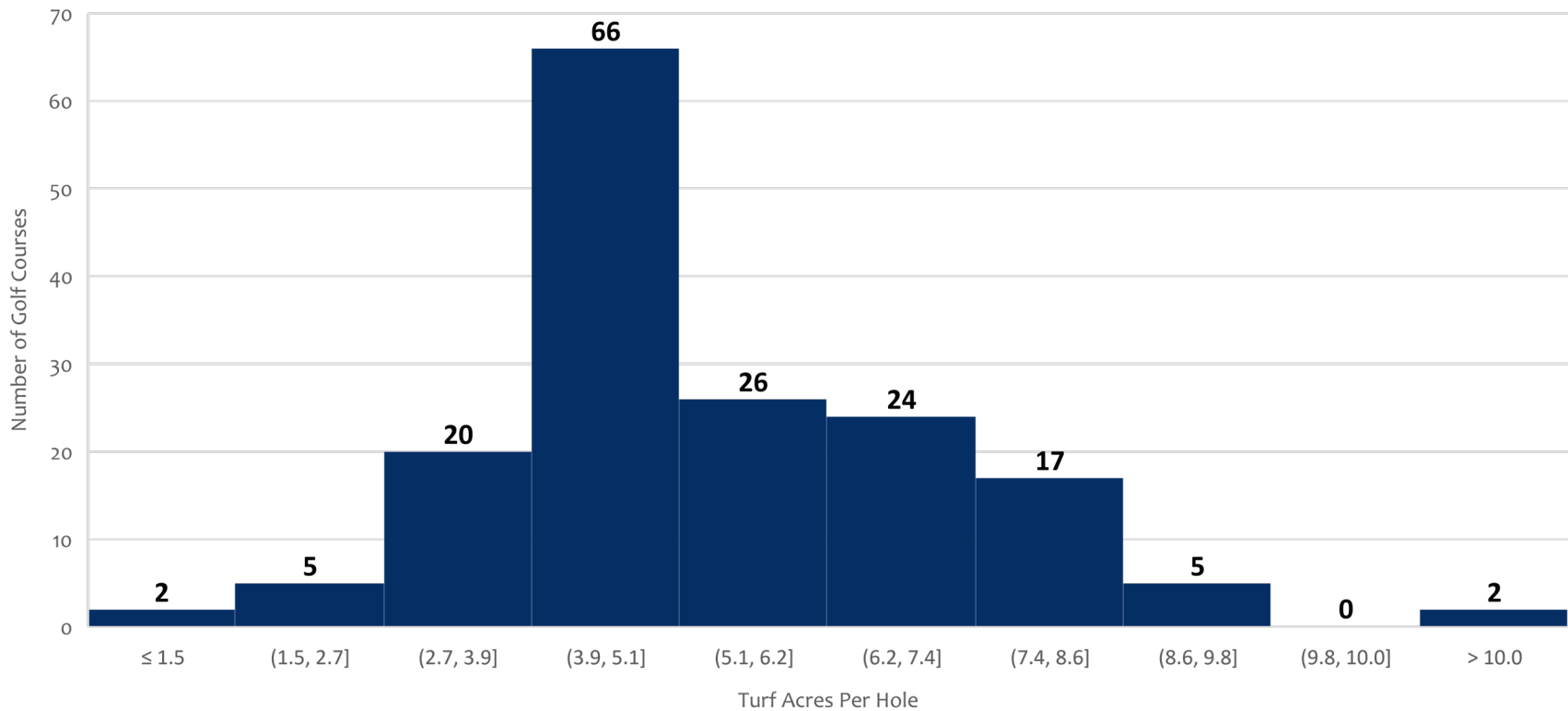


# Non-Golf Use by Source

Non-Golf Use by Source



# Distribution of Turf Acres per Hole (Phx AMA)



# Turf Related Facilities ( $\geq 10$ acres)



- \* Facility with 10 or more acres of water intensive landscaping
- \* Allotment Based Program (Based on the age and size of the facility)
- \* Incentives to use effluent for landscape watering
- \* Prepare long-range conservation plans.

# 3MP Turf Program

- \* Turf application rate based on Bermuda grass consumptive use
- \* Incentive for using effluent
- \* General structure and allowable additions vary by AMA
  - \* Years
  - \* Course type
  - \* Complexity



# Golf Courses – Application Rates (AF/ac)

## 3MP Application Rate Table:

Exceptions and limitations apply to individual line items and/or totals

Type of Landscaping	PrAMA	PhxAMA	PAMA	TAMA	SCAMA
Planted/Turf Acres	4.9	4.9	4.8	4.6	4.6
Historical Turf Acres		4.0			
Additional Turf Acres		3.0	3.0		
Historic Low Water Use Landscape		1.5	1.5		
Additional Low Water Use Landscape		1.5	1.5		
Total Low Water Use Landscape	1.5			1.5	1.5
Water Surface Area	5.5	6.2	6.2	5.8	5.8

# Recommendations for the Remaining Fourth Management Plans – Turf Conservation Programs







# Conservation Program Changes

Program	Provision	3MP	Adopted 4MPs	Remaining 4MPs
Ag – Districts	Line canals or 10% or less L&U	“10% or more of water deliveries for irrigation use”	“any water for irrigation use”	“any water for irrigation use”
Ag – Base	High Water Duty Adjustment	No change	No change	Top 25% of water duties reduced by up to 10%, within specific limitations
Ag – BMP	Points target	10 points	10 points	12 points
Ag – BMP	Points restructuring	Points accrued from 4 Categories	No change	Point values modified in Categories 1 & 2
Muni – GPCD	GPCD target	Recalculated with each Management Plan		
Muni - NPCCP	BMP or Points target	Tier 1 = 1 BMP Tier 2 = 5 BMPs Tier 3 = 10 BMPs	No change	Tier 1 = 2 points Tier 2 = 8 points Tier 3 = 15 points
Muni – NPCCP	Points restructuring	All items count as 1 BMP	No change	Certain BMPs count as multiple points
Industrial – Turf	Application Rate (AF/acre)	Calculated based on 75% Irrigation Efficiency	No change	Baseline rate calculated using 77.5% irrigation efficiency, with rate increasing on curve as acres per hole decreases
Industrial – Turf	Acres of turf	Certain golf courses limited to 5 acres of turf per hole	No change	Limitation applies to additional turf-related facilities

# Golf Courses – Application Rates (AF/ac)

## 4MP\* Proposed Application Rate Table:

*Exceptions and limitations apply to individual line items and/or totals.*

Type of Landscaping	PhxAMA	PAMA	SCAMA
Planted/Turf Acres	4.75**	4.65**	4.45**
Historical Turf Acres	4.0		
Additional Turf Acres	3.0	3.0	
Historic Low Water Use Landscape	1.5	1.5	
Additional Low Water Use Landscape	1.5	1.5	
Total Low Water Use Landscape			1.5
Water Surface Area	6.2	6.2	5.8

\*Prescott and Tucson AMAs have already adopted their 4MPs.

\*\*At 5 planted/turf acres per hole. Refer to formula and application rate table for further detail.



# Golf Courses

## New Turf/Planted Acres Application Rate Calculation:

$$AF \text{ Per Acre} = \frac{\left( \frac{\text{Maximum AF Per Hole}}{5^x \text{ Acres Per Hole}} \right) * \text{Actual Acres Per Hole}^x}{\text{Actual Acres Per Hole}}$$

- \* Formula which makes the application rate a function of the acres per hole:
  - \* Less acres per hole translates to a higher application rate.
  - \*  $x$  is a factor which determines the rate at which the application rate changes as the actual acres per hole changes.

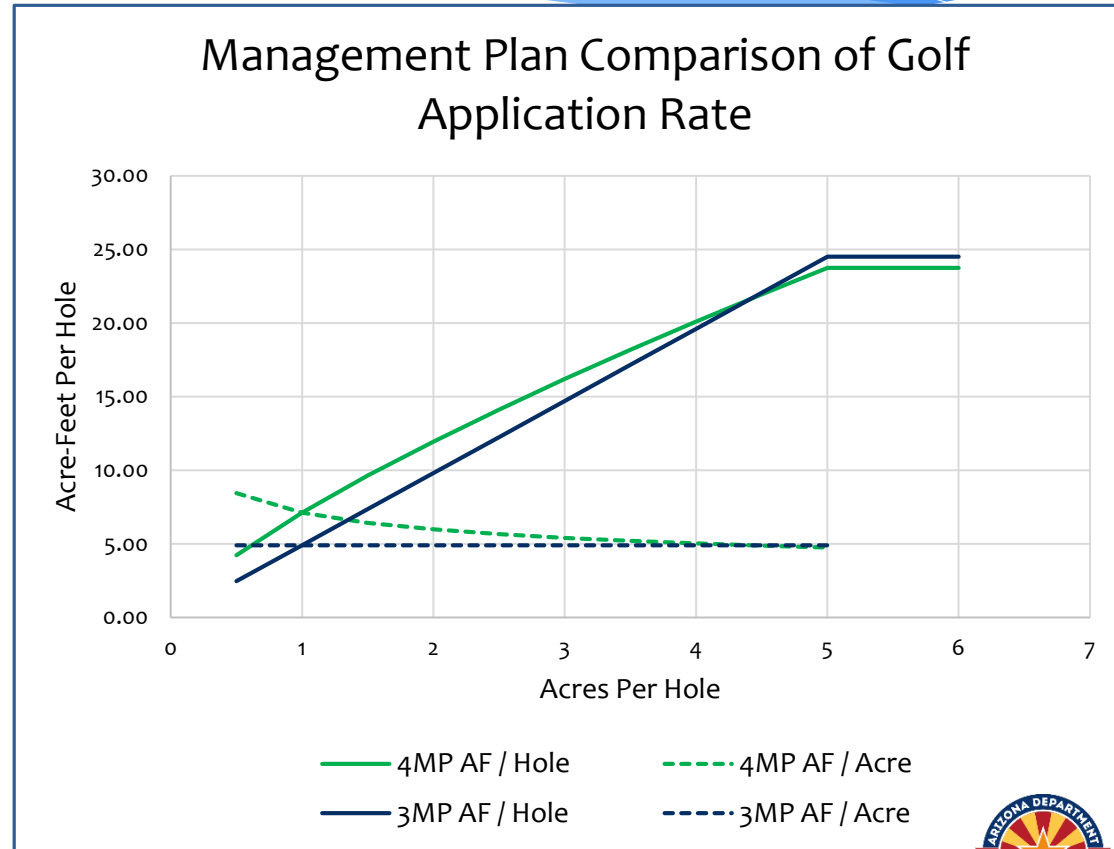
# Golf Courses

Example: Phoenix AMA

Max AF per Hole = 23.75

$$x = 0.75$$

Acres / Hole	3MP AF / Acre	4MP AF / Acre
0.5	4.9	8.45
1		7.10
1.5		6.42
2		5.97
2.5		5.65
3		5.40
3.5		5.19
4		5.02
4.5		4.88
5		4.75



# Discussion of Development of Turf Conservation Programs for the Fifth Management Plans



# Fifth Management Plan



## Framework for possible redesign of the Turf Conservation Program under the 5MP

### Goals:

- “Reduction in withdrawals of groundwater”
- Simplicity
- Inclusion of realistic over-seeding practices

### Needs:

- Categories
  - Golf Courses/Other Turf
  - Time Periods? (Pre/Post)
- Strategy for reducing total water use
- Strategy to incentivize use of non-groundwater sources

# Questions?

[managementplans@azwater.gov](mailto:managementplans@azwater.gov)

Management Plans Work Group:  
[new.azwater.gov/5MP](http://new.azwater.gov/5MP)

Full Text of Management Plans:  
[new.azwater.gov/ama/management-plans](http://new.azwater.gov/ama/management-plans)

