I. Welcome

II. Continue Discussion of Annual Safe-Yield Calculation
   A. Agricultural Incidental Recharge
   B. Streambed Recharge

III. Discuss Strategies for the Long-Term Analysis of Management Goals

IV. Closing Remarks
4MP

Phoenix AMA Adoption
Pinal AMA Adoption
Santa Cruz AMA Adoption

2019

MPWG

Drafting Plans

Adopting Plans

5MP

2021
2022
2023
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.”

ADWR-led stakeholder forum for the development of the 5th Management Plans

Goals:
* Assess existing conservation programs
* Update existing management strategies
* Develop new management strategies
Goals

* Consensus on methodology and definitions
  * Assessing each component
  * Identifying a general approach for assessing long-term status
  * Consistency across AMAs
* Clear communication of status of each AMA

Strategy

* Annual Calculation
  * Consensus on treatment of components
  * Consensus on annual calculation
* Long-Term Analysis
  * Approach(es) for “Long-Term” Analysis
  * Assessing “Progress toward goal”
* Best Practices for Communicating Status
AMA Data Page: https://new.azwater.gov/ama/ama-data

NEW

Safe-yield Dashboard
Safe-Yield Dataset

* Reported data is compiled and updated on an annual basis.
* Page also contains AMA Water Supply & Demand Dashboard and Dataset
Annual Safe-Yield Calculation
Management Goals
(A.R.S. § 45-562)

Safe-yield:
“A groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area.”

(A.R.S. § 45-561(12))

Prescott, Phoenix, and Tucson AMAs:
Safe-yield by the year 2025

Pinal AMA:
To allow development of non-irrigation uses and to preserve existing agricultural economies in the AMA for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.

Santa Cruz AMA:
To maintain a safe-yield condition in the AMA and to prevent local water tables from experiencing long term declines
Inflows
* Natural
  * Groundwater Inflow
  * Streambed Recharge
  * Mountain-front Recharge
* Artificial
  * Incidental Recharge
    * Agricultural
    * Municipal
    * Industrial
  * Canal Seepage
  * Cut to the Aquifer
  * CAGRD Replenishment

Outflows
* Natural
  * Groundwater Outflow
  * Riparian Demand
* Artificial
  * Sector Demands
    * Agricultural
    * Municipal
    * Industrial
    * Indian
  * Remediated Groundwater
  * Poor Quality Groundwater

Outstanding Items
* Natural
* Streambed Recharge
* Artificial
  * Agricultural Incidental Recharge
    * “Water Budget Approach”
* Anything else?
Agricultural Incidental Recharge

* Inflow
* Artificial
* Current Method:
  * Output of ADWR’s regional groundwater models
    * Method of lagging may differ between AMAs
* Current method differs from other sectors
  * Municipal & Industrial Incidental Recharge are calculated as a percent of total sector demands
    * Demands are compiled from AMA Annual Reports
    * Not lagged

Items to resolve:
1. Is there general consensus that we should move to calculating this as a percent of total sector demands?
   - Provides consistency with other sectors
   - Fits with “water budget” approach by removing lagging
Agricultural Incidental Recharge

* Inflow
* Artificial
* Current Method:
  * Output of ADWR’s regional groundwater models
  * Method of lagging may differ between AMAs
* Current method differs from other sectors
  * Municipal & Industrial Incidental Recharge are calculated as a percent of total sector demands
  * Demands are compiled from AMA Annual Reports
  * Not lagged

* Items to resolve:

2. If consensus on changing: Need to establish rate for each AMA.
   - Suggestion: Total demand * (10% transmission losses + ___% application losses)
   - Application losses = 100% - ___% irrigation efficiency
Streambed Recharge

- Inflow
- Natural component
- Output of ADWR’s regional groundwater models
- Variable year to year
- Exactly methodologies may differ between AMAs

Items to resolve:

1. Open questions re: differences between AMAs and lagging
   - Clarification
   - Recommendation to continue obtaining this data from ADWR’s models
Strategies for the Long-Term Analysis of Management Goals
“A groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area.”

A.R.S. § 45-561(12)
Safe-Yield Kick off Meeting:
Prescott Annual Overdraft

Inflows | Outflows | Overdraft | Linear (Overdraft)
Safe-Yield Kick off Meeting: Annual Overdraft and Trendlines
Long-Term Analysis

- Smooth specific components
- Choose a specific timeframe
- Safe-Yield by sector
- Communicating Safe-Yield
Smooth Components

* Smooth specific Components
  o Natural Recharge
  o Economic Factors
  o Availability of Imported or Renewable Supplies

* Potential Issues
  o Accuracy
Smooth/Control Components
Potential Results

Prescott Overdraft: 1985-2017

Inflows vs Outflows

Years

Overdraft
Linear (Overdraft)
Smooth/Control Components
Potential Results

Prescott Overdraft: Average Natural Inflows and Outflows

Years

Inflows | Outflows


-20,000 -15,000 -10,000 -5,000 0 5,000 10,000 15,000 20,000 25,000 30,000

Overdraft Linear (Overdraft)
Smooth/Control Components
Potential Results

Prescott Overdraft:
Lowest Natural Inflow, Highest Natural Outflow

Prescott Overdraft:
Highest Natural Inflow, Lowest Natural Outflow
Defining Long-Term

* Choose a time frame for long-term Safe-Yield
  - Groundwater Management Act Time Frame
  - Management Periods
    - 5, 10, or 20 years
    - Multiple time Periods
    - Different time periods for inflows and outflows

* Potential Issues
  - Can mask progress
  - Can mask lack of progress
Defining Long-Term Potential Results

Prescott Overdraft: 1985-2017

Inflows | Outflows

Years

-50,000 -40,000 -30,000 -20,000 -10,000 0 10,000 20,000 30,000


Overdraft Linear (Overdraft)
Defining Long-Term Potential Results
Defining Long-Term Potential Results

Prescott Overdraft:
Inflow: Long-Run Average Inflows, Outflows: 5-Year Average

- Overdraft
- Linear (Overdraft)
Safe-Yield by Sector

* Dividing Natural Recharge and Artificial Components

* How:
  - Proportional by total demand
  - Equal
  - Number of Rights
  - Developing a Factor

* Potential Issues
  - Equity
  - Assigning Value
  - Rewarding Large Users
Safe-Yield by Sector
Potential Results

Agricultural Overdraft - By Total Demand

Agricultural Overdraft - Equal Division
Safe-Yield by Sector
Potential Results

Industrial Overdraft - By Total Demand

Industrial Overdraft - Equal Division
Potential Safe-Yield Communication Strategies

* Identify a specific number as goal
  - Per AMA
  - Per Sector

* Potential Issues
  - Ties too much value to one number
  - Difficult to determine
Next Steps
Goals

- Consensus on methodology and definitions
  - Assessing each component
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Upcoming MPWG Meetings

Work Group

Subgroup
- Ag
  - 5/18/2020
- Muni
  - 6/4/2020
- Industrial
  - TBD
- Safe-Yield Technical
  - TBD

Breakout
- Turf
  - 6/22/2020
Questions?

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Management Plans Work Group:
new.azwater.gov/5MP

Full Text of Management Plans:
new.azwater.gov/ama/management-plans