



# **WATER FORWARD**

INTEGRATED WATER RESOURCE PLAN

## **Austin Integrated Water Resource Planning Community Task Force**

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**November 7, 2017**

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**Austin Integrated Water Resource Planning Community Task Force**  
**November 7, 2017 – 6:00 p.m.**  
**Waller Creek Center, Room 104**  
**625 East 10<sup>th</sup> Street**  
**Austin, Texas 78701**

**For more information go to:**  
**[Austin Integrated Water Resource Planning Community Task Force](#)**

## **AGENDA**

### **Voting Members:**

|                              |                 |                |
|------------------------------|-----------------|----------------|
| Sharlene Leurig - Chair      | Marianne Dwight | Sarah Richards |
| Jennifer Walker – Vice Chair | Diane Kennedy   | Lauren Ross    |
| Todd Bartee                  | Perry Lorenz    | Robert Mace    |
| Clint Dawson                 | Bill Moriarty   |                |

### **Ex Officio Non-Voting Members:**

Austin Water: Greg Meszaros  
Austin Energy: Kathleen Garrett  
Austin Resource Recovery: Sam Angoori  
Neighborhood Housing and Community Development: Rebecca Giello  
Office of Innovation: Kerry O'Connor  
Office of Sustainability: Lucia Athens  
Parks and Recreation: Sara Hensley  
Watershed Protection: Mike Personett

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### **1. CALL TO ORDER – November 7, 2017, 6:00 p.m.**

### **2. CITIZEN COMMUNICATION**

The first 10 speakers signed up prior to the meeting being called to order will each be allowed a three-minute allotment to address their concerns regarding items not posted on the agenda.

### **3. APPROVAL OF MEETING MINUTES**

- a. Approval of the meeting minutes from the September 12, 2017 Task Force meeting (5 minutes)

**4. STAFF BRIEFINGS, PRESENTATIONS, AND OR REPORTS**

- a. Draft Initial Portfolio Composition - City Staff and Consultant Team (30 minutes)
  - i. Task Force Discussion and Input

**5. SUBCOMMITTEE REPORTS**

**6. VOTING ITEMS FROM TASK FORCE**

**7. FUTURE AGENDA ITEMS**

**8. ADJOURN**

Note: Agenda item sequence and time durations noted above are subject to change.

The City of Austin is committed to compliance with the American with Disabilities Act. Reasonable modifications and equal access to communications will be provided upon request. Meeting locations are planned with wheelchair access. If requiring Sign Language Interpreters or alternative formats, please give notice at least 2 days (48 hours) before the meeting date. Please call Austin Integrated Water Resource Planning Community Task Force, at 512-972-0194, for additional information; TTY users route through Relay Texas at 711.

For more information on the Austin Integrated Water Resource Planning Community Task Force, please contact Marisa Flores Gonzalez at 512-972-0194.

# MINUTES



**The Austin Integrated Water Resource Planning Community Task Force convened in a Special Called Meeting on September 12, 2017 at Waller Creek Center, Conference Rm 104, 625 E 10<sup>th</sup> Street, in Austin, Texas.**

**Members in Attendance:**

Sharlene Leurig - Chair  
Jennifer Walker – Vice Chair  
William Moriarty  
Diane Kennedy

Perry Lorenz  
Robert Mace  
Sarah Richards  
Lauren Ross

Todd Bartee  
Marianne Dwight

**Ex-Officio Members in Attendance:**

Chris Herrington, Lucia Athens

**Staff in Attendance:**

Daryl Slusher, Kevin Critendon, Teresa Lutes, Marisa Flores Gonzalez, Joe Smith, Mark Jordan, Martin Tower

**Additional Attendees:**

Dan Rodrigo, Tina Petersen, Richard Hoffpauir

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**1. CALL TO ORDER**

Sharlene Leurig, Chair, called the meeting to order at 6:05 p.m.

**2. CITIZEN COMMUNICATION: GENERAL**

None

**3. APPROVAL OF MEETING MINUTES**

The meeting minutes from the August 1, 2017 Austin Integrated Water Resource Planning Community Task Force regular meeting were approved on Member Mace's motion and Member Moriarty's second on an 8-0-2-1 vote with Members Ross and Richards abstaining and Member Dawson absent.

**4. STAFF BRIEFINGS, PRESENTATIONS, AND/OR REPORTS**

- a. Presentation on Preliminary Portfolio Themes was provided by Marisa Flores Gonzalez, Senior Planner, Austin Water. This presentation was followed by a Task Force discussion including questions and answers.
- b. Presentation on Conceptual Portfolio Development Process was provided by Dan Rodrigo, CDM Smith. This presentation was followed by a Task Force discussion including questions and answers.
- c. Presentation on Preliminary Subobjectives Performance Metrics and Revised Weighting was provided by Dan Rodrigo, CDM Smith. This presentation was followed by a Task Force discussion including questions and answers.

**5. SUBCOMMITTEE REPORTS**

None

**6. VOTING ITEMS FROM TASK FORCE**

None

**7. FUTURE AGENDA ITEMS**

None

Chair Leurig adjourned the meeting at 8:41 pm.

# **PRESENTATION**

# Water Forward Task Force Meeting

November 7, 2017



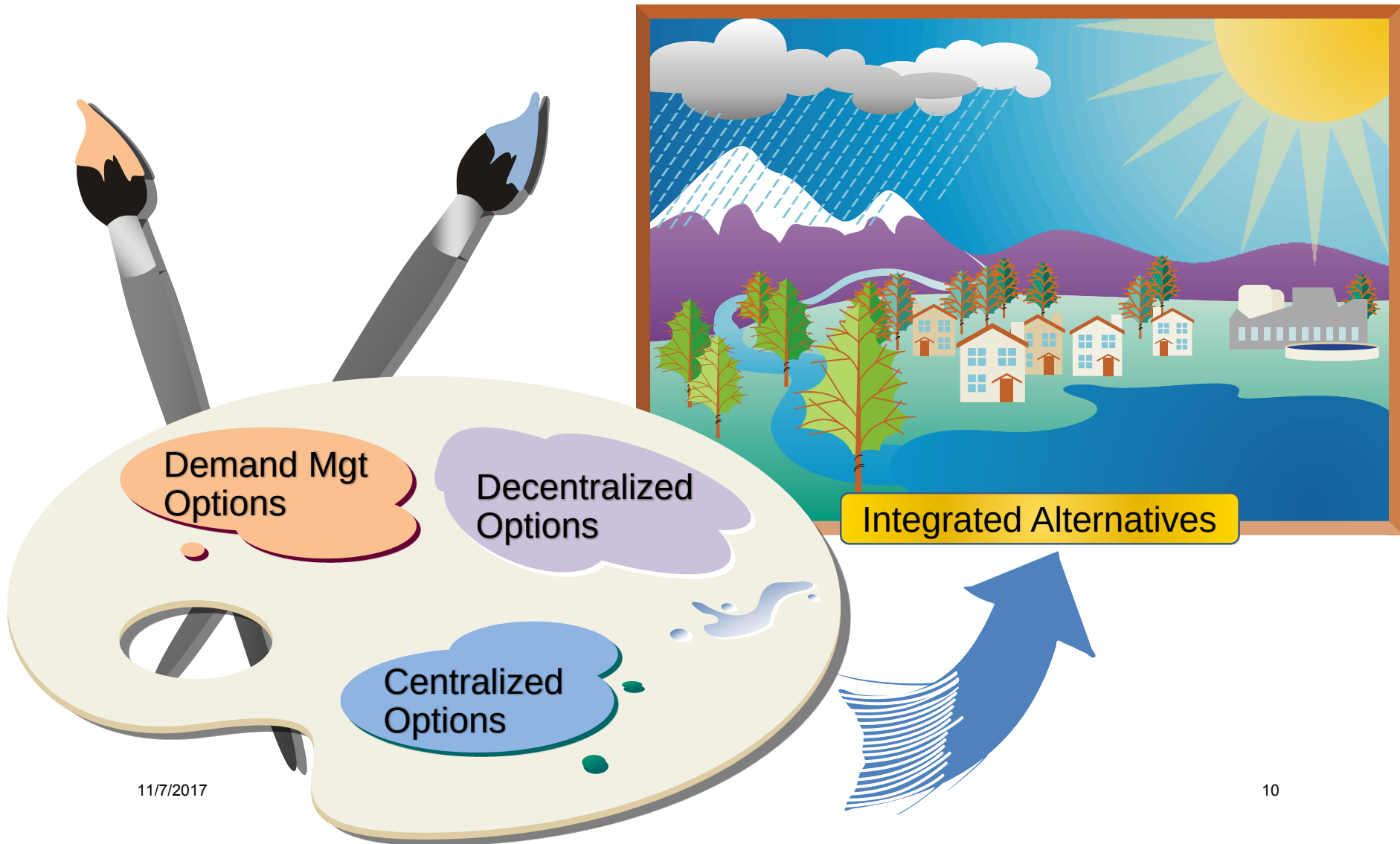
## Agenda

- Presentation of Draft Initial Portfolio Composition
  - Task Force Questions, Discussion, and Input
- Next Steps



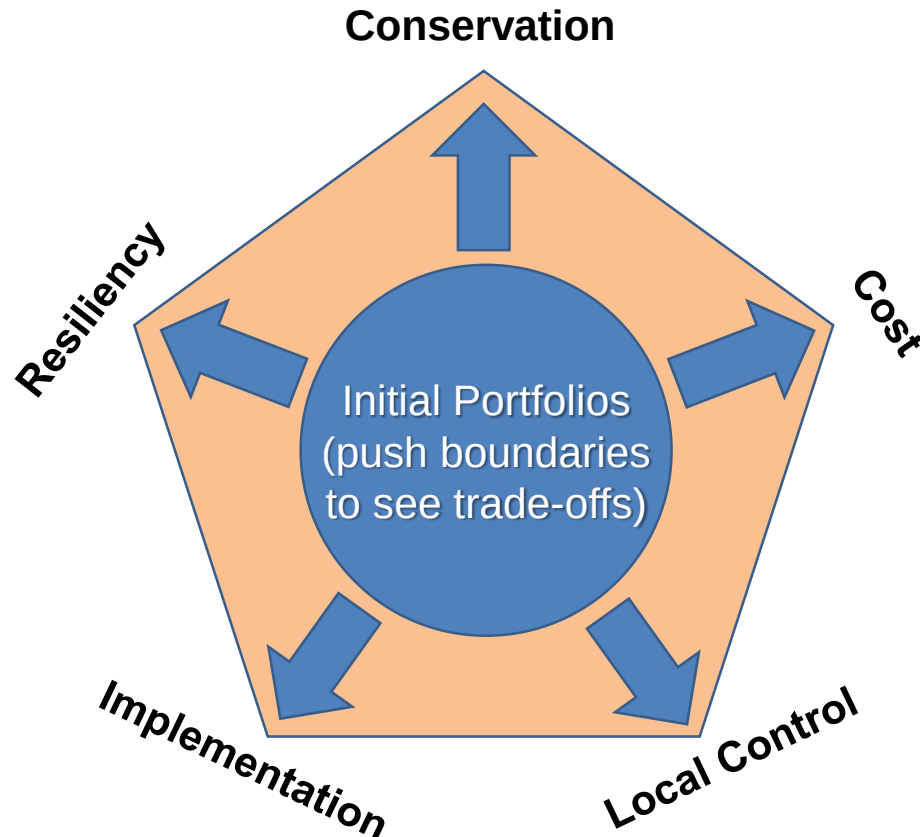
## Draft Initial Portfolios

# Creating Integrated Portfolios



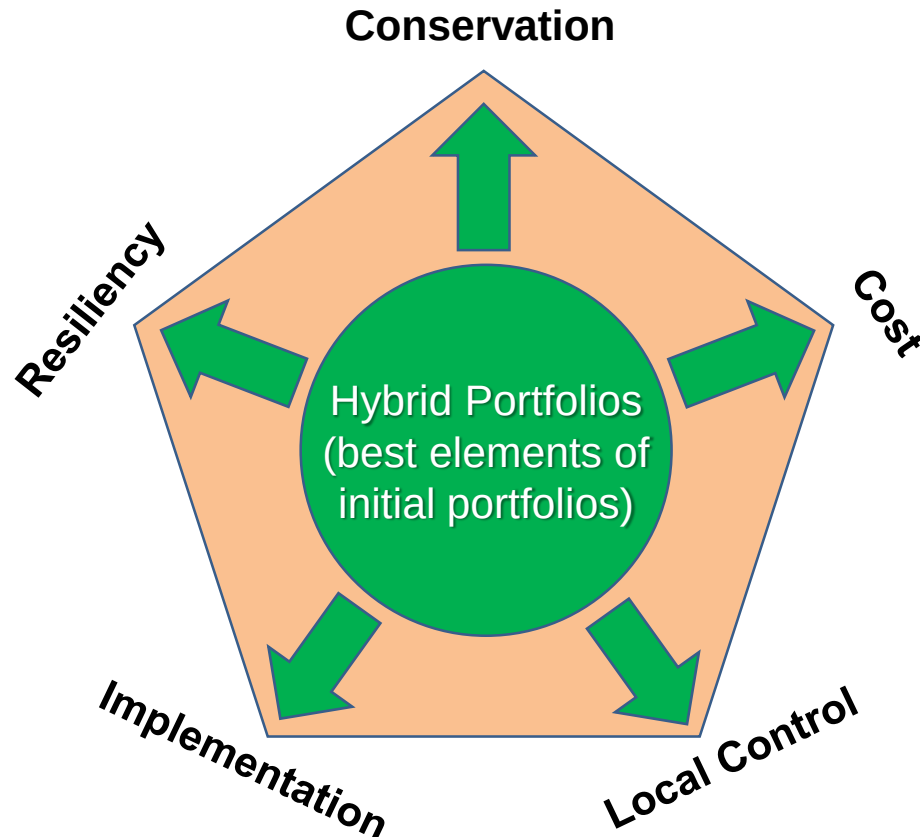
# Building Initial Portfolios

- Designed to push boundaries using “themes”, so trade-offs can easily be seen. What is the cost of achieving maximum reliability? or What is the social benefit of maximizing conservation?



# Building Hybrid Portfolios

- This process of pushing boundaries for the initial portfolios allows us to quickly develop hybrid portfolios, which take best elements from initial portfolios for higher performance against our objectives.



## Portfolio Themes

| Portfolio Theme                                            | Definition                                                                                 |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Maximize Conservation and Environmental Stewardship</b> | Generally conservation, decentralized lot and community scale options                      |
| <b>Minimize Cost/Maximize Affordability</b>                | Generally options with unit costs under \$2,000/AF                                         |
| <b>Maximize Supply Reliability and Climate Resiliency</b>  | Generally options that produce consistent supply benefits under all hydrologic variability |
| <b>Minimize Implementation Challenges</b>                  | Generally options that are easy or moderately easy to implement                            |
| <b>Maximize Local Control Over Resources</b>               | Generally options that AW or the community have direct control over in terms of operations |

# Water Needs

| Water Needs          | Definition                                                                                                                                                                                                  |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type 1 Needs*</b> | Managing risk associated with drought conditions triggering prolonged prohibition on outdoor water use (COA DCP Stage 4). All types of options (demand management and supply) can be used for Type 1 Needs. |
| <b>Type 2 Needs*</b> | Managing risk associated with extremely low Highland Lake levels. Only options that can produce potable water for AW’s delivery system can be used for Type 2 Needs.                                        |
| <b>Type 3 Needs</b>  | Managing risk associated with needs above the current LCRA contract (325,000 AF). All types of options (demand management and supply) can be used for Type 3 Needs.                                         |

\* Implementation of demand management options may reduce Type 1 and Type 2 needs, based on WAM modeling.

## Needs For Building Initial Portfolios Summary Table

Although the POR scenario shows no supply need, the DWDOR scenario shows needs in 2020 that could be used to develop 2020 portfolios.

|                                                                                | 2020     | 2040          | 2070          | 2115           |
|--------------------------------------------------------------------------------|----------|---------------|---------------|----------------|
| Type 1 - Needs to Manage Prolonged Stage 4 Risk (Demand Management and Supply) | 0        | 10,600        | 15,400        | 24,800         |
| Type 2 – Needs to Manage extremely low Highland Lakes levels (Potable Supply)  | 0        | 20,400        | 77,000        | 93,600         |
| Type 3 - Needs Above Current LCRA Contract (Demand Management and Supply)      | TBD      | TBD           | TBD           | 170,400        |
| <b>Total Water Needs</b>                                                       | <b>0</b> | <b>31,000</b> | <b>92,400</b> | <b>288,800</b> |

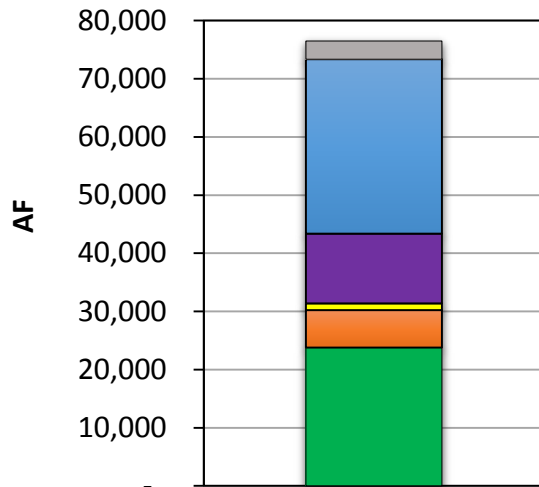
# Process for Building Portfolios

1. Chose combination of potable supplies, non-potable supplies and demand management options that best meets theme of portfolio and the Type 1, Type 2 and Type 3 needs for year 2115. When any demand management options are selected, a predetermined ramp up from 2020 to 2115 of savings/supply yield is used based on growth (these options require a build-up of saturation and cannot be brought online like a supply option).
2. For years 2040 and 2070, ensure that there are enough potable water supply options to meet Type 2 needs.
3. Use other non-potable supply options, consistent with the portfolio theme, to fill in any remaining Type 1 needs.

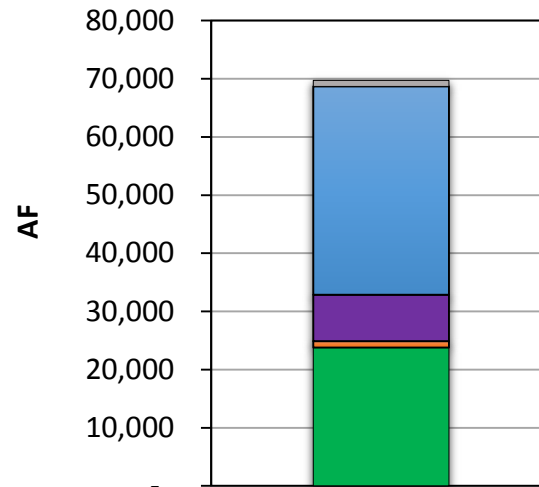


## Portfolio Make Up Summary in 2040

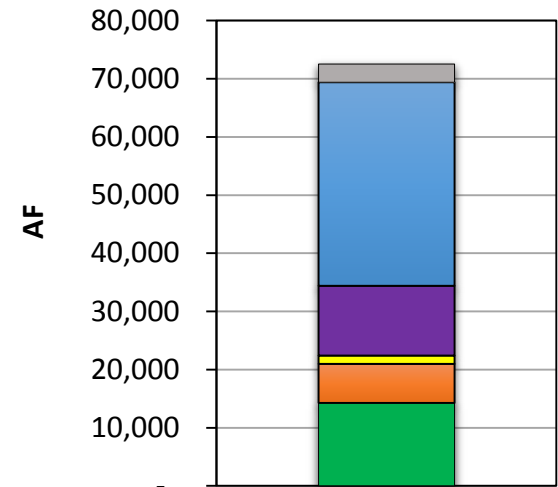
**Max Conservation**



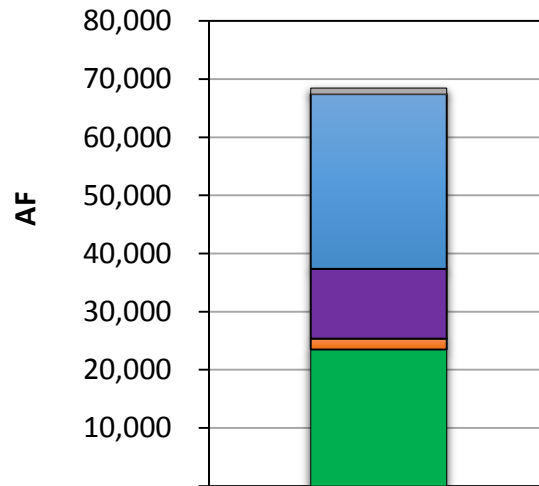
**Min Cost**



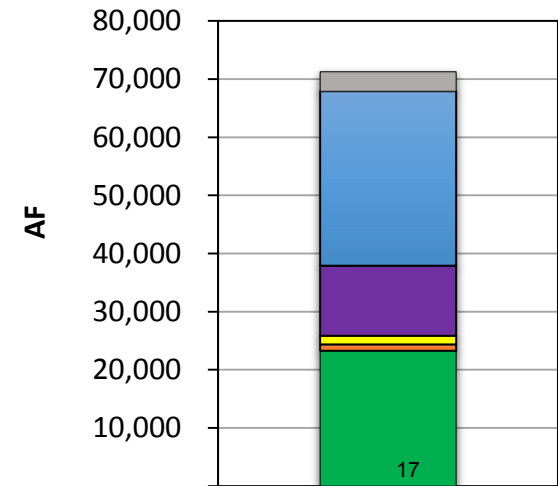
**Max Reliability**



**Min Implement. Challenges**

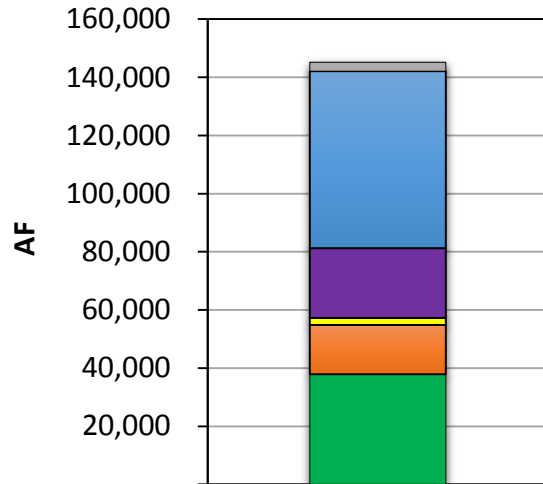


**Max Local Control**

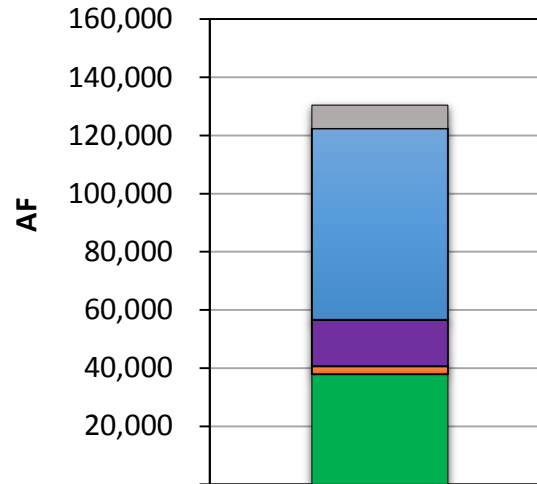


## Portfolio Make Up Summary in 2070

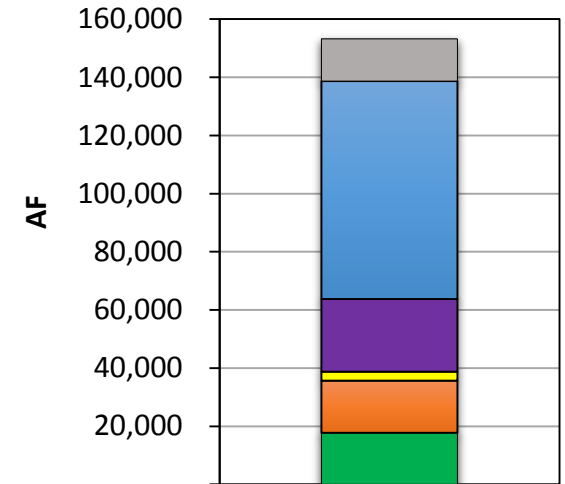
**Max Conservation**



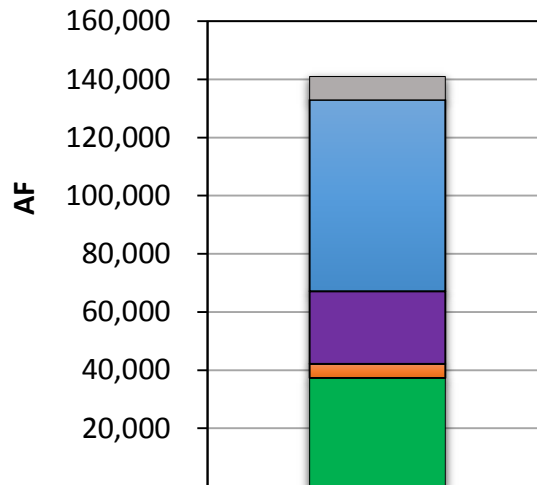
**Min Cost**



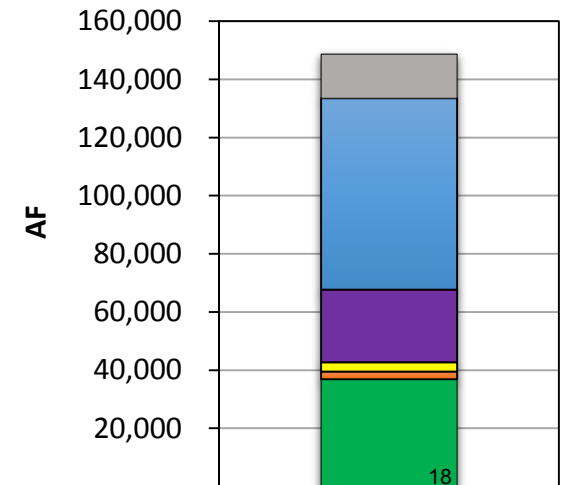
**Max Reliability**



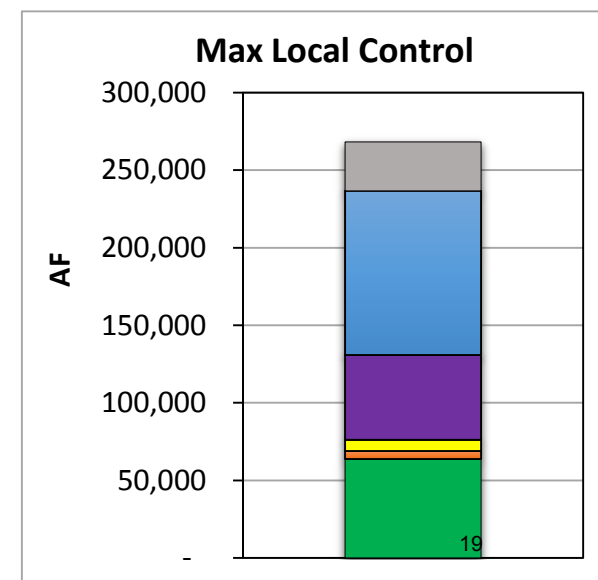
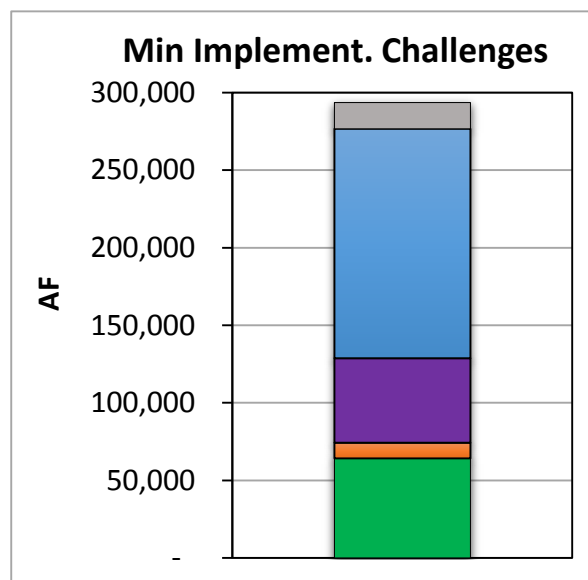
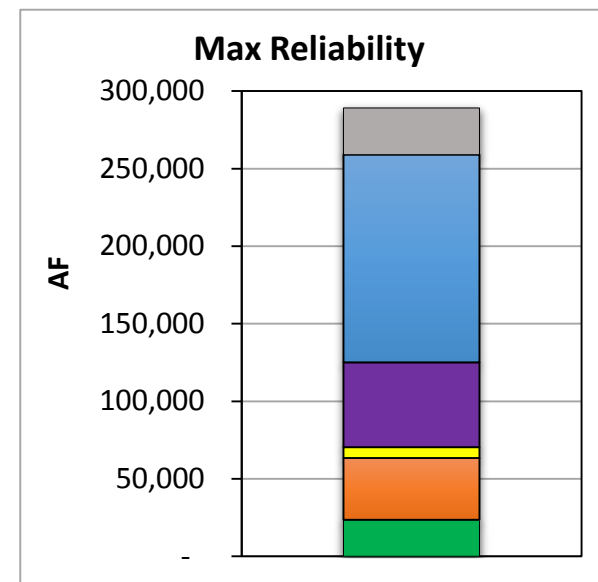
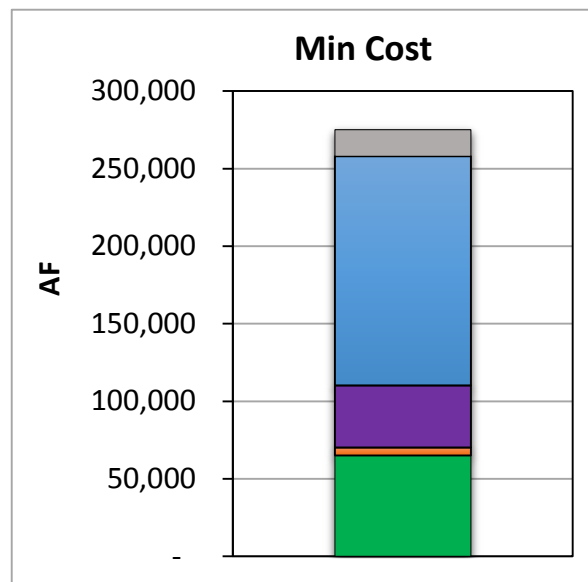
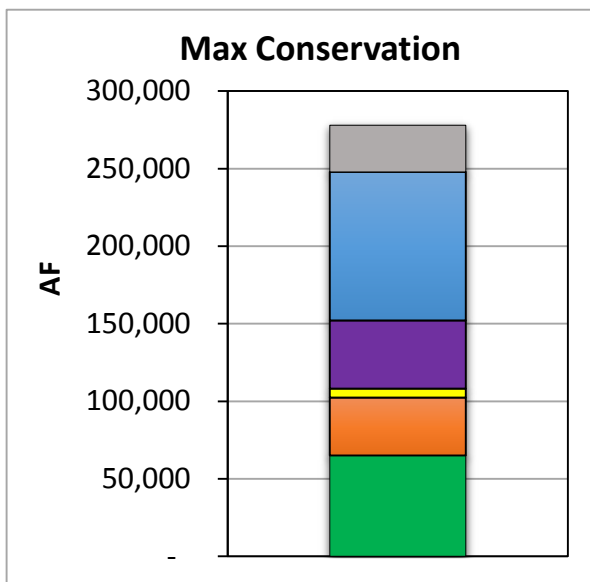
**Min Implement. Challenges**



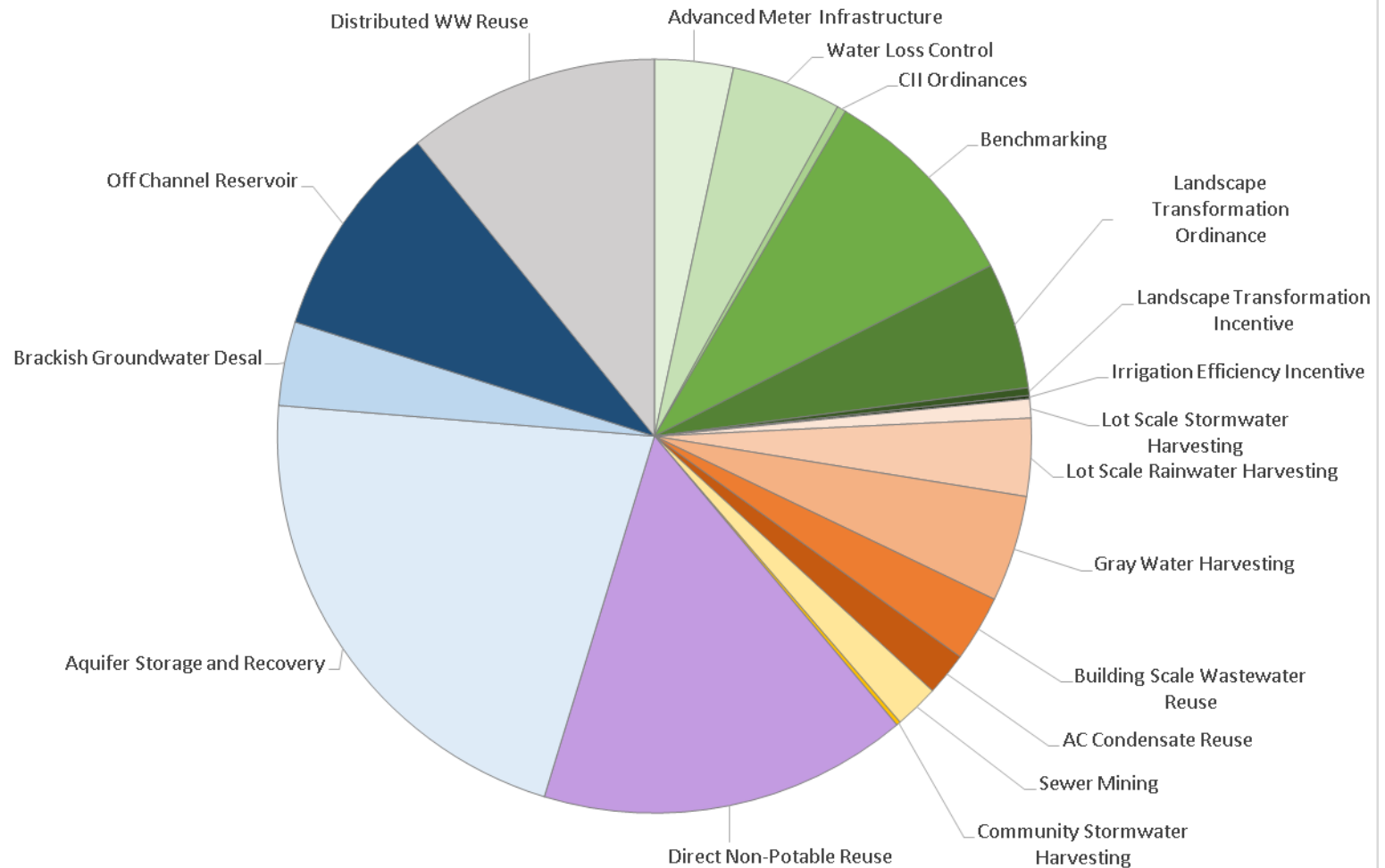
**Max Local Control**



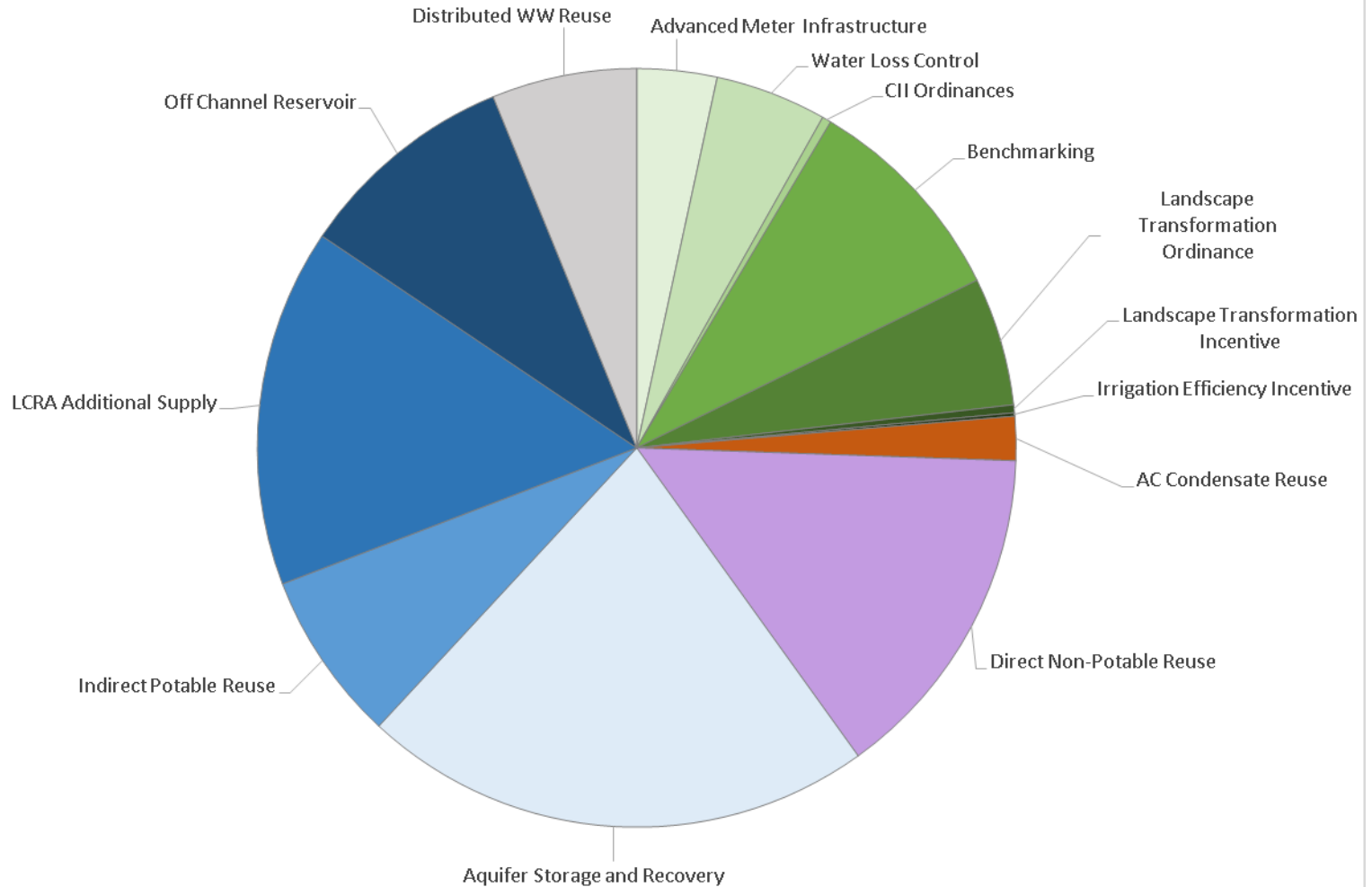
## Portfolio Make Up Summary in 2115



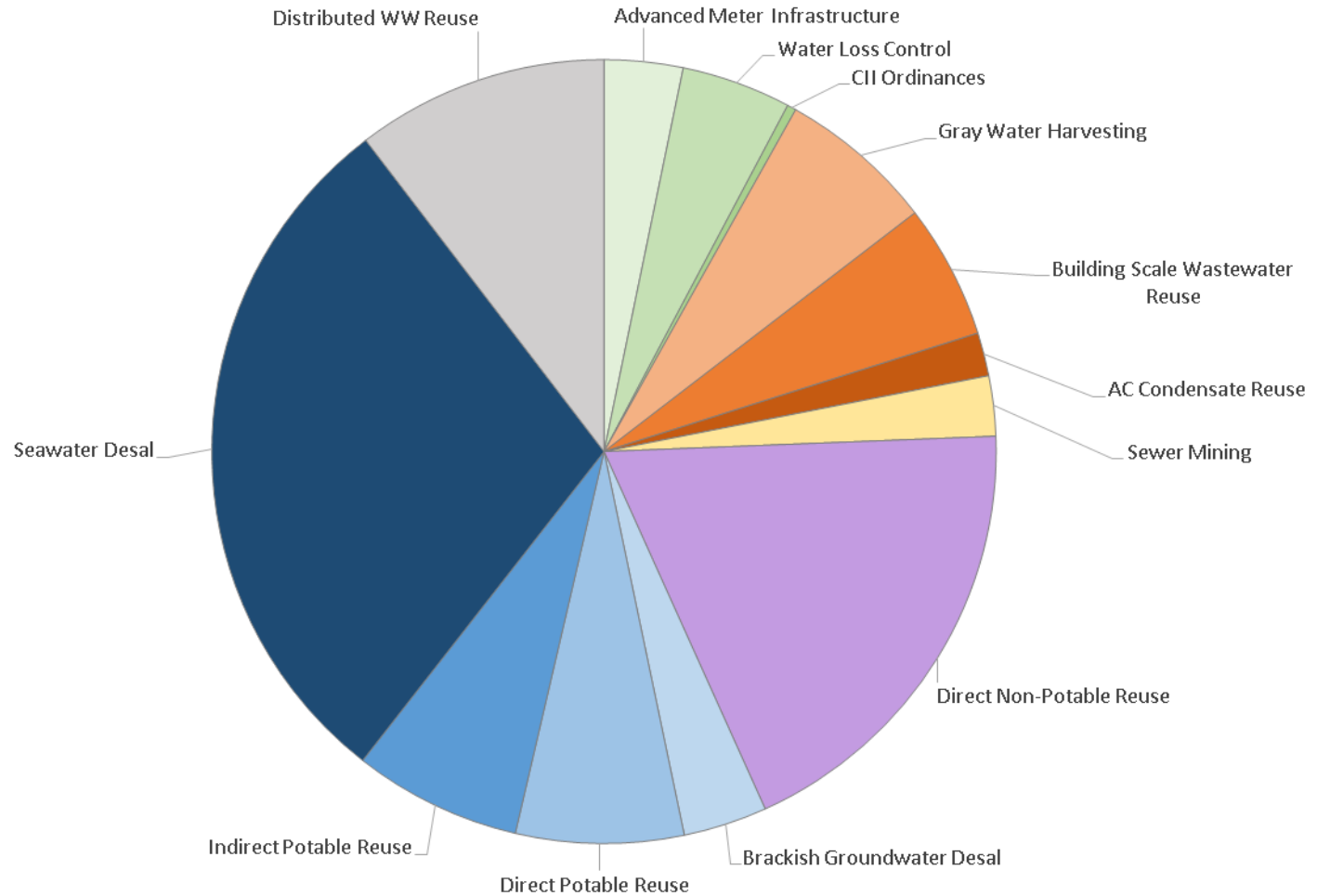
## Maximize Conservation and Environmental Stewardship 2115



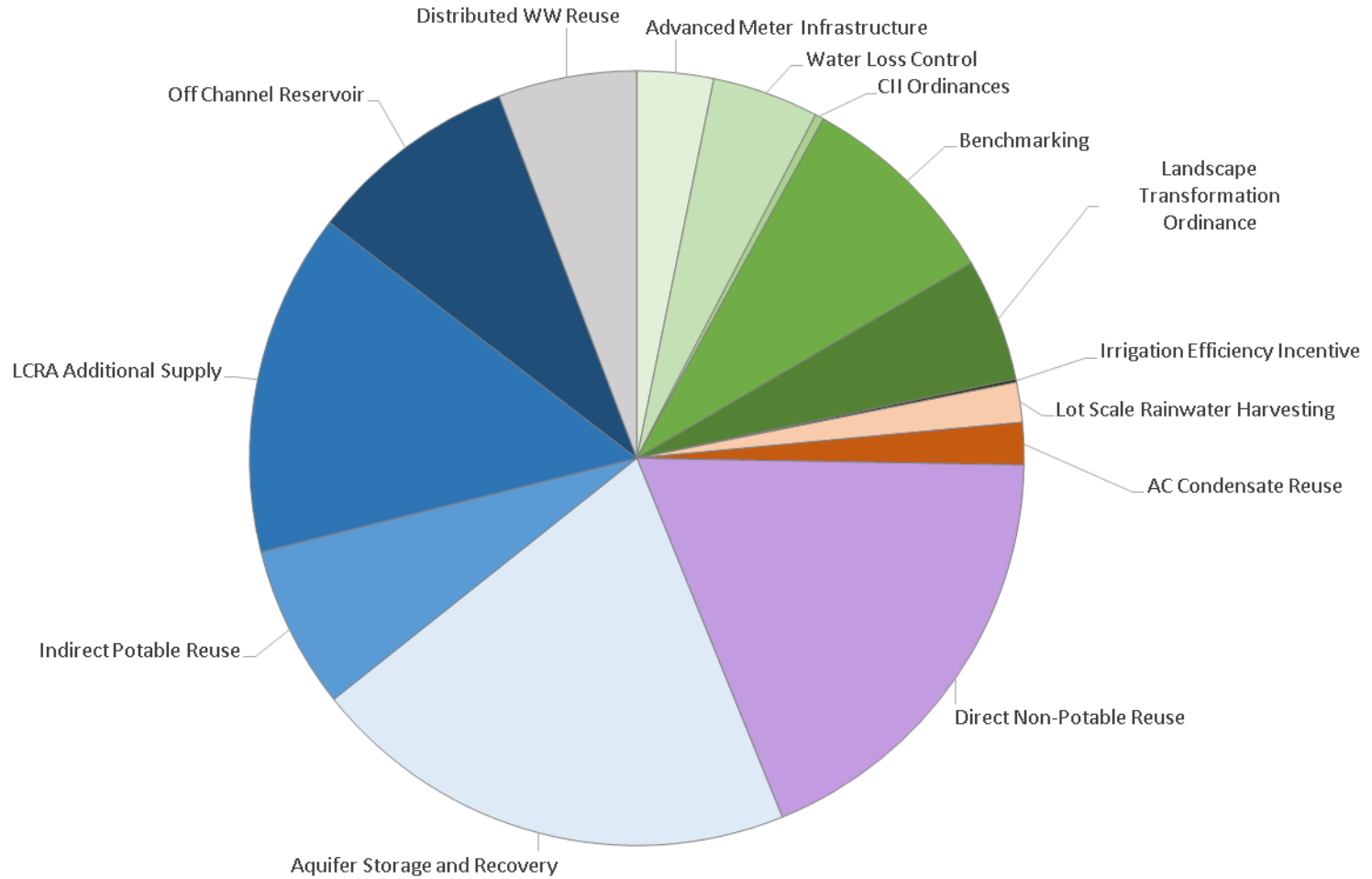
## Minimize Cost/Maximize Affordability 2115



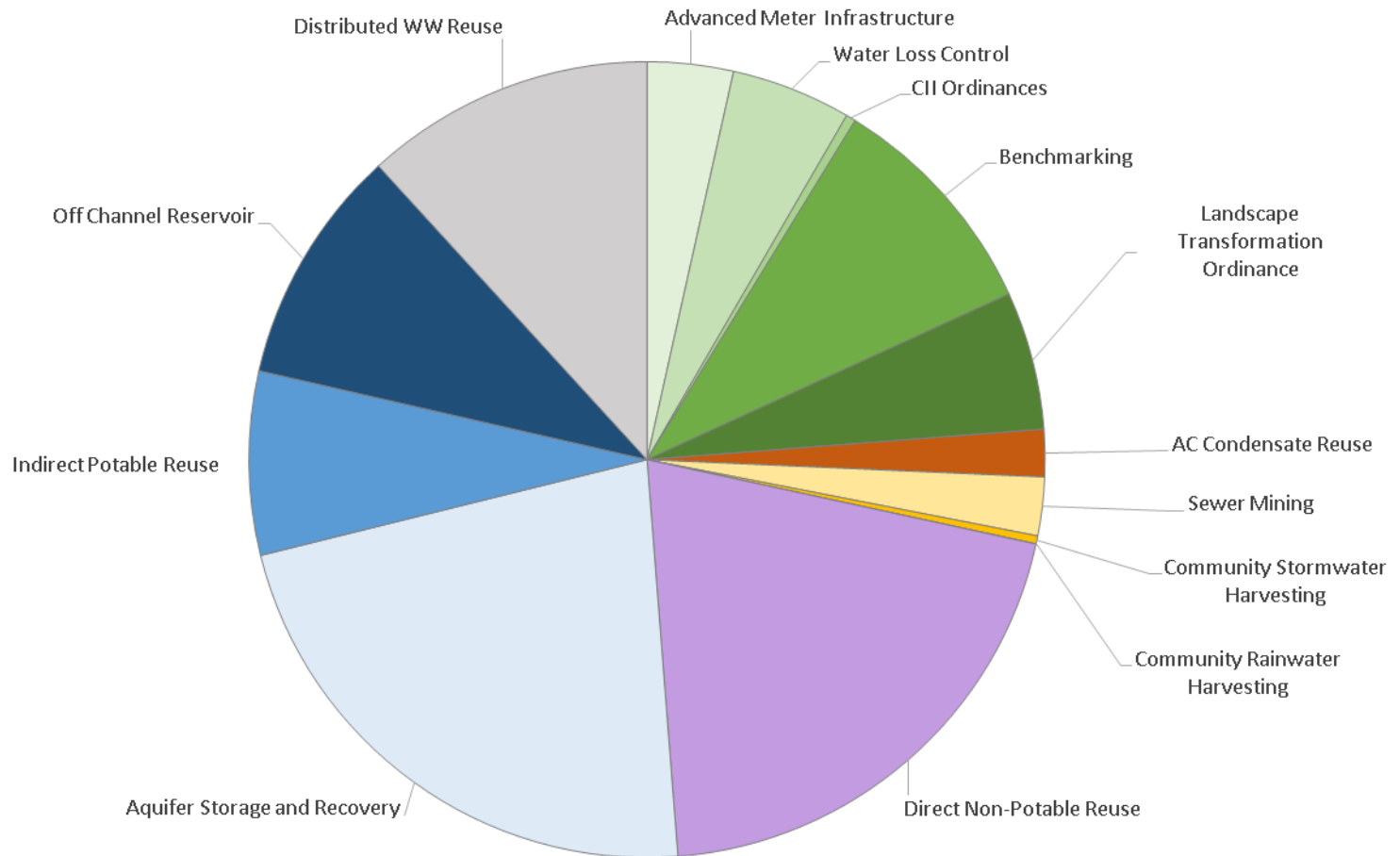
## Maximize Water Supply Reliability and Climate Resiliency 2115



## Minimize Implementation Challenges 2115



## Maximize Local Control 2115





# Portfolio Make Up Hand Outs

- Summary Comparison for All Initial Portfolios for Each Year  
(one page for 2040, 2070, and 2115)
- Detailed Information for Each Portfolio for All Years  
(one page per portfolio)

## Questions and Discussion

## Next Steps

# Next Steps

- November 13<sup>th</sup> Deadline
  - Task Force feedback on Initial Portfolios due
- December 5<sup>th</sup> Task Force Meeting
  - Presentation of Initial Portfolio scoring
  - Initial Task Force input into Hybrid Portfolio development (if ready)
- January 2018 Task Force Meeting
  - Additional discussion of Initial Portfolio scoring and Task Force input into Hybrid Portfolio development
- February 2018 Task Force Meeting
  - Presentation of draft Hybrid Portfolio scoring
- March 2018 Task Force Meeting
  - Presentation of draft plan recommendations

## Questions and Discussion

# **BACKUP MATERIALS**

## Portfolio Summary Year 2115

| Options                              | Max Conservation | Min Cost | Max Reliability | Min Implementation Challenges | Max Local Control |
|--------------------------------------|------------------|----------|-----------------|-------------------------------|-------------------|
| Conservation                         | All              | All      | Few             | Most                          | Most              |
| Building Scale Decentralized Options | All              | None     | Some            | Few                           | None              |
| ASR                                  | Yes              | Yes      | No              | Yes                           | Yes               |
| GW Brackish Desal                    | Yes              | No       | Yes             | No                            | No                |
| Non Potable Reuse                    | Yes              | Yes      | Yes             | Yes                           | Yes               |
| IPR                                  | No               | Yes      | Yes             | Yes                           | Yes               |
| DPR                                  | No               | No       | Yes             | No                            | No                |
| LCRA Additional Supply               | No               | Yes      | No              | Yes                           | No                |
| Off Channel Reservoir                | Yes              | Yes      | No              | Yes                           | Yes               |
| Seawater Desal                       | No               | No       | Yes             | No                            | No                |
| Distributed WW Reuse                 | Yes              | Yes      | Yes             | Yes                           | Yes               |
| Sewer Mining                         | Yes              | No       | Yes             | No                            | Yes               |
| Community Stormwater/Rainwater       | Some             | No       | No              | No                            | Yes               |
| Total Demand Side Options (AFY)      | 102,316          | 70,249   | 63,301          | 74,213                        | 68,926            |
| Total Supply Side Options (AFY)      | 175,663          | 204,816  | 225,817         | 219,416                       | 199,285           |
| Total Potable Supply Options (AFY)   | 95,827           | 147,827  | 134,000         | 147,827                       | 105,827           |
| Total of All Options (AFY)           | 277,979          | 275,065  | 289,118         | 293,629                       | 268,210           |
|                                      |                  |          |                 |                               |                   |
| Type 1 Needs                         | 19,684           | 21,288   | 21,635          | 21,089                        | 21,354            |
| Type 2 Needs                         | 88,484           | 90,088   | 90,435          | 89,889                        | 90,154            |
| Type 3 Needs                         | 170,400          | 170,400  | 170,400         | 170,400                       | 170,400           |
| Total Needs                          | 278,568          | 281,775  | 282,470         | 281,379                       | 281,907           |

Summary of Draft Initial Portfolios

11/7/2017

| #                         | Options        | Decentralized Option Parameters |                              |     |     |     |          |                                           | CDM Portfolio Tool Parameters |                      | Maximize Conservation and Environmental Stewardship |                 |                         |                    |                    |                    |                    |        |
|---------------------------|----------------|---------------------------------|------------------------------|-----|-----|-----|----------|-------------------------------------------|-------------------------------|----------------------|-----------------------------------------------------|-----------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------|
|                           |                | Sub-Option / Scenario           | SFR                          | MFR | COM | COA | End Uses | Type of New Development Option Applies To | Resiliency Score              | Implemen. Challenges | On?                                                 | Implement. Year | Decent. Saturation Rate | 2020 Yield (AF/Yr) | 2040 Yield (AF/Yr) | 2070 Yield (AF/Yr) | 2115 Yield (AF/Yr) |        |
| Demand Management Options | D1             | AMI                             |                              |     |     |     |          |                                           |                               | High                 | 4                                                   | ✓               | 2020                    |                    | 596                | 3,882              | 5,766              | 9,371  |
|                           | D2             | Water Loss Control              |                              |     |     |     |          |                                           |                               | High                 | 4                                                   | ✓               | 2020                    |                    | 3,108              | 9,326              | 10,918             | 13,064 |
|                           | D3             | CII Ordinances                  |                              |     |     |     |          |                                           |                               | High                 | 4                                                   | ✓               | 2020                    |                    | 1,063              | 1,063              | 1,063              | 1,063  |
|                           | D4             | Benchmarking                    |                              |     |     |     |          |                                           |                               | High                 | 2                                                   | ✓               | 2020                    |                    | -                  | 5,953              | 11,670             | 25,228 |
|                           | D5             | Landscape Ordinance             |                              |     |     |     |          |                                           |                               | Medium               | 2                                                   | ✓               | 2020                    |                    | -                  | 3,038              | 7,428              | 15,050 |
|                           | D6             | Landscape Incentive             |                              |     |     |     |          |                                           |                               | Medium               | 3                                                   | ✓               | 2020                    |                    | -                  | 321                | 633                | 929    |
|                           | D7             | Irrigation Incentive            |                              |     |     |     |          |                                           |                               | Medium               | 3                                                   | ✓               | 2020                    |                    | 42                 | 205                | 427                | 394    |
|                           | D8             | Lot Scale Stormwater Harvesting | Outdoor                      |     | Y   |     |          | IRR                                       | All                           | Medium               | 2                                                   | ✓               | 2020                    | 20%                | -                  | 180                | 496                | 1,391  |
|                           |                |                                 | Outdoor                      |     |     | Y   |          | IRR                                       | All                           |                      |                                                     | ✓               | 2020                    | 20%                | -                  | 149                | 373                | 885    |
|                           |                |                                 | Dual pipe                    |     | Y   |     |          | IRR TL CW                                 | All                           |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                |                                 | Dual pipe                    |     |     | Y   |          | IRR TL CW HVC                             | All                           |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D9             | Lot Scale Rainwater Harvesting  | Outdoor                      | Y   |     |     |          | IRR                                       | All                           | Medium               | 2                                                   | ✓               | 2020                    | 40%                | -                  | 937                | 2,410              | 5,088  |
|                           |                |                                 | Outdoor                      |     | Y   |     |          | IRR                                       | All                           |                      |                                                     |                 |                         |                    | -                  | 54                 | 151                | 425    |
|                           |                |                                 | Outdoor                      |     |     | Y   |          | IRR                                       | All                           |                      |                                                     |                 |                         |                    | -                  | 82                 | 209                | 498    |
|                           |                |                                 | Dual pipe                    | Y   |     |     |          | IRR TL CW                                 | All                           |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                |                                 | Dual pipe                    |     | Y   |     |          | IRR TL                                    | All                           |                      |                                                     | ✓               | 2020                    | 20%                | -                  | 195                | 556                | 1,562  |
|                           |                |                                 | Dual pipe                    |     |     | Y   |          | IRR TL HVC                                | All                           |                      |                                                     | ✓               | 2020                    | 20%                | -                  | 281                | 706                | 1,678  |
|                           |                |                                 | Potable                      | Y   |     |     |          | ALL                                       | All                           |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                |                                 |                              |     |     |     |          |                                           |                               |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D10            | Gray Water Harvesting           | Outdoor                      | Y   |     |     |          | IRR                                       | All                           | High                 | 2                                                   | ✓               | 2020                    | 10%                | -                  | 244                | 631                | 1,336  |
|                           |                |                                 | Outdoor                      |     | Y   |     |          | IRR                                       | All                           |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                |                                 | Outdoor                      |     |     | Y   |          | IRR                                       | All                           |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                |                                 | Dual pipe                    | Y   |     |     |          | IRR TL CW                                 | All                           |                      |                                                     | ✓               | 2020                    | 10%                | -                  | 571                | 1,461              | 2,860  |
|                           |                |                                 | Dual pipe                    |     | Y   |     |          | IRR TL CW                                 | All                           |                      |                                                     | ✓               | 2020                    | 20%                | -                  | 991                | 2,702              | 6,832  |
|                           |                |                                 | Dual pipe                    |     |     | Y   |          | IRR TL                                    | All                           |                      |                                                     | ✓               | 2020                    | 15%                | -                  | 321                | 823                | 1,638  |
|                           | D11            | Building Scale Wastewater Reuse | Dual pipe                    |     | Y   |     |          | IRR TL CW                                 | All                           | High                 | 2                                                   |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                |                                 | Dual pipe                    |     |     | Y   |          | IRR TL CW HVC                             | All                           |                      |                                                     | ✓               | 2020                    | 20%                | -                  | 1,323              | 3,672              | 7,875  |
|                           | D12            | AC Condensate Reuse             |                              |     |     |     |          |                                           |                               | High                 | 2                                                   | ✓               | 2020                    |                    | 100                | 1,084              | 2,711              | 5,150  |
|                           | Supply Options | S1                              | Aquifer Storage and Recovery |     |     |     |          |                                           |                               |                      | High                                                | 3               | ✓                       | 2040               |                    | -                  | 30,000             | 30,000 |
| S2                        |                | Brackish Groundwater Desal      |                              |     |     |     |          |                                           |                               | Medium               | 2                                                   | ✓               | 2070                    |                    | -                  | -                  | 5,000              | 10,000 |
| S3                        |                | Direct Non-Potable Reuse        |                              |     |     |     |          |                                           |                               | High                 | 4                                                   | ✓               | 2020                    |                    | 4,000              | 12,000             | 24,000             | 44,000 |
| S4                        |                | Direct Potable Reuse            |                              |     |     |     |          |                                           |                               | High                 | 1                                                   |                 |                         |                    | -                  | -                  | -                  | -      |
| S5                        |                | Indirect Potable Reuse          |                              |     |     |     |          |                                           |                               | High                 | 2                                                   |                 |                         |                    | -                  | -                  | -                  | -      |
| S6                        |                | LCRA Additional Supply          |                              |     |     |     |          |                                           |                               | Low                  | 5                                                   |                 |                         |                    | -                  | -                  | -                  | -      |
| S7                        |                | Off Channel Reservoir           |                              |     |     |     |          |                                           |                               | Medium               | 3                                                   | ✓               | 2070                    |                    | -                  | -                  | 25,827             | 25,827 |
| S8                        |                | Seawater Desal                  |                              |     |     |     |          |                                           |                               | High                 | 1                                                   |                 |                         |                    | -                  | -                  | -                  | -      |
| S9                        |                | Distributed WW Reuse            | Dual pipe                    | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Greenfield                    | High                 | 3                                                   | ✓               | 2040                    | 70%                | -                  | 3,154              | 14,467             | 30,049 |
| S10                       |                | Sewer Mining                    | Outdoor                      |     |     |     | Y        | IRR                                       | NA                            | High                 | 2                                                   | ✓               | 2040                    | 40%                | -                  | -                  | -                  | -      |
|                           |                |                                 | Dual pipe                    | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Mainly Brownfield             |                      |                                                     | ✓               | 2040                    | 30%                | -                  | 1,000              | 2,211              | 5,284  |
| S11                       |                | Community Stormwater            | Outdoor                      |     |     |     | Y        | IRR                                       | NA                            | Medium               | 3                                                   | ✓               | 2040                    | 30%                | -                  | 48                 | 48                 | 48     |
|                           |                |                                 | Outdoor                      | Y   | Y   | Y   | Y        | IRR                                       | Green&Brownfield              |                      |                                                     | ✓               | 2040                    | 30%                | -                  | 109                | 188                | 455    |
|                           |                |                                 | Dual pipe                    | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Green&Brownfield              |                      |                                                     |                 |                         |                    | -                  | -                  | -                  | -      |
| S12                       |                | Community Rainwater             | Dual pipe                    | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Greenfield                    | Medium               | 2                                                   |                 |                         |                    | -                  | -                  | -                  | -      |

|                                    |  |       |        |         |         |
|------------------------------------|--|-------|--------|---------|---------|
| Total Demand Side Options (AFY)    |  | 5,108 | 30,202 | 54,806  | 102,316 |
| Total Supply Side Options (AFY)    |  | 4,000 | 46,312 | 101,741 | 175,663 |
| Total Potable Supply Options (AFY) |  | -     | 30,000 | 60,827  | 95,827  |
| Total of All Options (AFY)         |  | 9,108 | 76,514 | 156,547 | 277,979 |

|              |  |       |        |        |         |
|--------------|--|-------|--------|--------|---------|
| Type 1 Needs |  | 2,745 | 9,090  | 12,660 | 19,684  |
| Type 2 Needs |  | 4,365 | 10,735 | 59,462 | 88,484  |
| Type 3 Needs |  | -     | -      | -      | 170,400 |
| Total Needs  |  | 7,110 | 19,825 | 72,122 | 278,568 |

|                                                                  |  |       |        |        |        |
|------------------------------------------------------------------|--|-------|--------|--------|--------|
| Additional Supply or Demand Options Required to meet Water Needs |  | -     | -      | -      | 589    |
| Total Supplies Available to meet Type 2 Water Needs              |  | -     | 30,000 | 60,827 | 95,827 |
| Additional Supply Side Options Required to Meet Type 2 Need      |  | 4,365 | -      | -      | -      |

|                                       |  |       |        |        |         |
|---------------------------------------|--|-------|--------|--------|---------|
| Options Available to meet Type 1 need |  | 200   | 4,534  | 12,000 | 25,692  |
| Options Available to meet Type 2 need |  | -     | 30,000 | 60,827 | 95,827  |
| Options Available to meet Type 3 need |  | 8,908 | 41,980 | 83,720 | 156,461 |



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| #                         | Options | Decentralized Option Parameters |           |     |     |     |          |                                           | CDM Portfolio Tool Parameters |                      | Minimize Cost/Maximize Affordability |                 |                         |                    |                    |                    |                    |        |
|---------------------------|---------|---------------------------------|-----------|-----|-----|-----|----------|-------------------------------------------|-------------------------------|----------------------|--------------------------------------|-----------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------|
|                           |         | Sub-Option / Scenario           | SFR       | MFR | COM | COA | End Uses | Type of New Development Option Applies To | Resiliency Score              | Implemen. Challenges | On?                                  | Implement. Year | Decent. Saturation Rate | 2020 Yield (AF/Yr) | 2040 Yield (AF/Yr) | 2070 Yield (AF/Yr) | 2115 Yield (AF/Yr) |        |
| Demand Management Options | D1      | AMI                             |           |     |     |     |          |                                           |                               | High                 | 4                                    | ✓               | 2020                    |                    | 596                | 3,882              | 5,766              | 9,371  |
|                           | D2      | Water Loss Control              |           |     |     |     |          |                                           |                               | High                 | 4                                    | ✓               | 2020                    |                    | 3,108              | 9,326              | 10,918             | 13,064 |
|                           | D3      | CII Ordinances                  |           |     |     |     |          |                                           |                               | High                 | 4                                    | ✓               | 2020                    |                    | 1,063              | 1,063              | 1,063              | 1,063  |
|                           | D4      | Benchmarking                    |           |     |     |     |          |                                           |                               | High                 | 2                                    | ✓               | 2020                    |                    | -                  | 5,953              | 11,670             | 25,228 |
|                           | D5      | Landscape Ordinance             |           |     |     |     |          |                                           |                               | Medium               | 2                                    | ✓               | 2020                    |                    | -                  | 3,038              | 7,428              | 15,050 |
|                           | D6      | Landscape Incentive             |           |     |     |     |          |                                           |                               | Medium               | 3                                    | ✓               | 2020                    |                    | -                  | 321                | 633                | 929    |
|                           | D7      | Irrigation Incentive            |           |     |     |     |          |                                           |                               | Medium               | 3                                    | ✓               | 2040                    |                    | -                  | 205                | 427                | 394    |
|                           | D8      | Lot Scale Stormwater Harvesting | Outdoor   |     | Y   |     |          | IRR                                       | All                           | Medium               | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Outdoor   |     |     | Y   |          | IRR                                       | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     | Y   |     |          | IRR TL CW                                 | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     |     | Y   |          | IRR TL CW HVC                             | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D9      | Lot Scale Rainwater Harvesting  | Outdoor   | Y   |     |     |          | IRR                                       | All                           | Medium               | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Outdoor   |     | Y   |     |          | IRR                                       | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Outdoor   |     |     | Y   |          | IRR                                       | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe | Y   |     |     |          | IRR TL CW                                 | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     | Y   |     |          | IRR TL                                    | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     |     | Y   |          | IRR TL HVC                                | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Potable   | Y   |     |     |          | ALL                                       | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 |           |     |     |     |          |                                           |                               |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D10     | Gray Water Harvesting           | Outdoor   | Y   |     |     |          | IRR                                       | All                           | High                 | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Outdoor   |     | Y   |     |          | IRR                                       | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Outdoor   |     |     | Y   |          | IRR                                       | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe | Y   |     |     |          | IRR TL CW                                 | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     | Y   |     |          | IRR TL CW                                 | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     |     | Y   |          | IRR TL                                    | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D11     | Building Scale Wastewater Reuse | Dual pipe |     | Y   |     |          | IRR TL CW                                 | All                           | High                 | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe |     |     | Y   |          | IRR TL CW HVC                             | All                           |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D12     | AC Condensate Reuse             |           |     |     |     |          |                                           |                               | High                 | 2                                    | ✓               | 2020                    |                    | 100                | 1,084              | 2,711              | 5,150  |
| Supply Options            | S1      | Aquifer Storage and Recovery    |           |     |     |     |          |                                           |                               | High                 | 3                                    |                 |                         |                    |                    |                    |                    |        |
|                           |         |                                 |           |     |     |     |          |                                           |                               |                      |                                      | ✓               | 2070                    |                    | -                  | -                  | 30,000             | 60,000 |
|                           | S2      | Brackish Groundwater Desal      |           |     |     |     |          |                                           |                               | Medium               | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S3      | Direct Non-Potable Reuse        |           |     |     |     |          |                                           |                               | High                 | 4                                    | ✓               | 2020                    |                    | 4,000              | 8,000              | 16,000             | 40,000 |
|                           | S4      | Direct Potable Reuse            |           |     |     |     |          |                                           |                               | High                 | 1                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S5      | Indirect Potable Reuse          |           |     |     |     |          |                                           |                               | High                 | 2                                    | ✓               | 2040                    |                    | -                  | 10,000             | 10,000             | 20,000 |
|                           | S6      | LCRA Additional Supply          |           |     |     |     |          |                                           |                               | Low                  | 5                                    | ✓               | 2020                    |                    | -                  | -                  | -                  | 42,000 |
|                           | S7      | Off Channel Reservoir           |           |     |     |     |          |                                           |                               | Medium               | 3                                    | ✓               | 2040                    |                    | -                  | 25,827             | 25,827             | 25,827 |
|                           | S8      | Seawater Desal                  |           |     |     |     |          |                                           |                               | High                 | 1                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S9      | Distributed WW Reuse            | Dual pipe | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Greenfield                    | High                 | 3                                    | ✓               | 2040                    | 20%                | -                  | 1,055              | 8,025              | 16,989 |
|                           | S10     | Sewer Mining                    | Outdoor   |     |     |     | Y        | IRR                                       | NA                            | High                 | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Mainly Brownfield             |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S11     | Community Stormwater            | Outdoor   |     |     |     | Y        | IRR                                       | NA                            | Medium               | 3                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Outdoor   | Y   | Y   | Y   | Y        | IRR                                       | Green&Brownfield              |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |         |                                 | Dual pipe | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Green&Brownfield              |                      |                                      |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S12     | Community Rainwater             | Dual pipe | Y   | Y   | Y   | Y        | IRR TL CW HVC                             | Greenfield                    | Medium               | 2                                    |                 |                         |                    | -                  | -                  | -                  | -      |

|                                    |  |       |        |         |         |
|------------------------------------|--|-------|--------|---------|---------|
| Total Demand Side Options (AFY)    |  | 4,867 | 24,874 | 40,615  | 70,249  |
| Total Supply Side Options (AFY)    |  | 4,000 | 44,882 | 89,852  | 204,816 |
| Total Potable Supply Options (AFY) |  | 0     | 35,827 | 65,827  | 147,827 |
| Total of All Options (AFY)         |  | 8,867 | 69,755 | 130,468 | 275,065 |

|              |  |       |        |        |         |
|--------------|--|-------|--------|--------|---------|
| Type 1 Needs |  | 2,757 | 9,356  | 13,369 | 21,288  |
| Type 2 Needs |  | 4,443 | 12,440 | 64,003 | 90,088  |
| Type 3 Needs |  | 0     | 0      | 0      | 170,400 |
| Total Needs  |  | 7,199 | 21,797 | 77,372 | 281,775 |

|                                                                  |  |       |        |        |         |
|------------------------------------------------------------------|--|-------|--------|--------|---------|
| Additional Supply or Demand Options Required to meet Water Needs |  | -     | -      | -      | 6,710   |
| Total Supplies Available to meet Type 2 Water Needs              |  | -     | 35,827 | 65,827 | 147,827 |
| Additional Supply Side Options Required to Meet Type 2 Need      |  | 4,443 | -      | -      | -       |

|                                       |  |       |        |        |         |
|---------------------------------------|--|-------|--------|--------|---------|
| Options Available to meet Type 1 need |  | 100   | 2,139  | 10,736 | 22,139  |
| Options Available to meet Type 2 need |  | -     | 35,827 | 65,827 | 105,827 |
| Options Available to meet Type 3 need |  | 8,767 | 31,789 | 53,905 | 147,099 |

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| #                         | Options             | Decentralized Option Parameters |                              |     |     |     |               |                                           | CDM Portfolio Tool Parameters |                      | Maximize Water Supply Reliability and Climate Resiliency |                 |                         |                    |                    |                    |                    |        |        |
|---------------------------|---------------------|---------------------------------|------------------------------|-----|-----|-----|---------------|-------------------------------------------|-------------------------------|----------------------|----------------------------------------------------------|-----------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------|--------|
|                           |                     | Sub-Option / Scenario           | SFR                          | MFR | COM | COA | End Uses      | Type of New Development Option Applies To | Resiliency Score              | Implemen. Challenges | On?                                                      | Implement. Year | Decent. Saturation Rate | 2020 Yield (AF/Yr) | 2040 Yield (AF/Yr) | 2070 Yield (AF/Yr) | 2115 Yield (AF/Yr) |        |        |
| Demand Management Options | D1                  | AMI                             |                              |     |     |     |               |                                           |                               | High                 | 4                                                        | ✓               | 2020                    |                    | 596                | 3,882              | 5,766              | 9,371  |        |
|                           | D2                  | Water Loss Control              |                              |     |     |     |               |                                           |                               | High                 | 4                                                        | ✓               | 2020                    |                    | 3,108              | 9,326              | 10,918             | 13,064 |        |
|                           | D3                  | CII Ordinances                  |                              |     |     |     |               |                                           |                               | High                 | 4                                                        | ✓               | 2020                    |                    | 1,063              | 1,063              | 1,063              | 1,063  |        |
|                           | D4                  | Benchmarking                    |                              |     |     |     |               |                                           |                               | High                 | 2                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           | D5                  | Landscape Ordinance             |                              |     |     |     |               |                                           |                               | Medium               | 2                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           | D6                  | Landscape Incentive             |                              |     |     |     |               |                                           |                               | Medium               | 3                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           | D7                  | Irrigation Incentive            |                              |     |     |     |               |                                           |                               | Medium               | 3                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           | D8                  | Lot Scale Stormwater Harvesting | Outdoor                      |     | Y   |     |               | IRR                                       | All                           | Medium               | 2                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Outdoor                      |     |     | Y   |               | IRR                                       | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    |     | Y   |     |               | IRR TL CW                                 | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    |     |     | Y   |               | IRR TL CW HVC                             | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           | D9                  | Lot Scale Rainwater Harvesting  | Outdoor                      | Y   |     |     |               | IRR                                       | All                           | Medium               | 2                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Outdoor                      |     | Y   |     |               | IRR                                       | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Outdoor                      |     |     | Y   |               | IRR                                       | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    | Y   |     |     |               | IRR TL CW                                 | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    |     | Y   |     |               | IRR TL                                    | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    |     |     | Y   |               | IRR TL HVC                                | All                           |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           | D10                 | Gray Water Harvesting           | Potable                      | Y   |     |     |               | ALL                                       | All                           | High                 | 2                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Outdoor                      | Y   |     |     |               | IRR                                       | All                           |                      |                                                          | ✓               | 2040                    | 20%                | -                  | 488                | 1,262              | 2,672  |        |
|                           |                     |                                 | Outdoor                      |     | Y   |     |               | IRR                                       | All                           |                      |                                                          | ✓               | 2040                    | 20%                | -                  | 334                | 925                | 2,524  |        |
|                           |                     |                                 | Outdoor                      |     |     | Y   |               | IRR                                       | All                           |                      |                                                          | ✓               | 2040                    | 20%                | -                  | 229                | 665                | 1,558  |        |
|                           |                     |                                 | Dual pipe                    | Y   |     |     |               | IRR TL CW                                 | All                           |                      |                                                          | ✓               | 2040                    | 10%                | -                  | 571                | 1,461              | 2,860  |        |
|                           |                     |                                 | Dual pipe                    |     | Y   |     |               | IRR TL CW                                 | All                           |                      |                                                          | ✓               | 2040                    | 20%                | -                  | 991                | 2,702              | 6,832  |        |
|                           | D11                 | Building Scale Wastewater Reuse | Dual pipe                    |     | Y   |     |               | IRR TL CW                                 | All                           | High                 | 2                                                        | ✓               | 2040                    | 10%                | -                  | 585                | 1,637              | 4,209  |        |
|                           |                     |                                 | Dual pipe                    |     |     | Y   |               | IRR TL CW HVC                             | All                           |                      |                                                          | ✓               | 2040                    | 30%                | -                  | 1,985              | 5,509              | 11,812 |        |
|                           | D12                 | AC Condensate Reuse             |                              |     |     |     |               |                                           |                               | High                 | 2                                                        | ✓               | 2020                    |                    | 100                | 1,084              | 2,711              | 5,150  |        |
|                           | Supply Options      | S1                              | Aquifer Storage and Recovery |     |     |     |               |                                           |                               |                      | High                                                     | 3               |                         |                    |                    | -                  | -                  | -      | -      |
|                           |                     | S2                              | Brackish Groundwater Desal   |     |     |     |               |                                           |                               |                      | Medium                                                   | 2               | ✓                       | 2040               |                    | -                  | 5,000              | 5,000  | 10,000 |
| S3                        |                     | Direct Non-Potable Reuse        |                              |     |     |     |               |                                           |                               | High                 | 4                                                        | ✓               | 2020                    |                    | 4,000              | 12,000             | 25,000             | 54,600 |        |
| S4                        |                     | Direct Potable Reuse            |                              |     |     |     |               |                                           |                               | High                 | 1                                                        | ✓               | 2040                    |                    | -                  | 20,000             | 20,000             | 20,000 |        |
| S5                        |                     | Indirect Potable Reuse          |                              |     |     |     |               |                                           |                               | High                 | 2                                                        | ✓               | 2040                    |                    | -                  | 10,000             | 10,000             | 20,000 |        |
| S6                        |                     | LCRA Additional Supply          |                              |     |     |     |               |                                           |                               | Low                  | 5                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
| S7                        |                     | Off Channel Reservoir           |                              |     |     |     |               |                                           |                               | Medium               | 3                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
| S8                        |                     | Seawater Desal                  |                              |     |     |     |               |                                           |                               | High                 | 1                                                        | ✓               | 2070                    |                    | -                  | -                  | 40,000             | 84,000 |        |
| S9                        |                     | Distributed WW Reuse            | Dual pipe                    | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Greenfield                    | High                 | 3                                                        | ✓               | 2070                    | 70%                | -                  | 3,154              | 14,467             | 30,049 |        |
| S10                       |                     | Sewer Mining                    | Outdoor                      |     |     |     | Y             | IRR                                       | NA                            | High                 | 2                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Mainly Brownfield             |                      |                                                          | ✓               | 2040                    | 50%                | -                  | 1,417              | 3,012              | 7,168  |        |
| S11                       |                     | Community Stormwater            | Outdoor                      |     |     |     | Y             | IRR                                       | NA                            | Medium               | 3                                                        |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Outdoor                      | Y   | Y   | Y   | Y             | IRR                                       | Green&Brownfield              |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
|                           |                     |                                 | Dual pipe                    | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Green&Brownfield              |                      |                                                          |                 |                         |                    | -                  | -                  | -                  | -      |        |
| S12                       | Community Rainwater | Dual pipe                       | Y                            | Y   | Y   | Y   | IRR TL CW HVC | Greenfield                                | Medium                        | 2                    |                                                          |                 |                         | -                  | -                  | -                  | -                  |        |        |

|                                    |  |       |        |         |         |
|------------------------------------|--|-------|--------|---------|---------|
| Total Demand Side Options (AFY)    |  | 4,867 | 20,967 | 35,716  | 63,301  |
| Total Supply Side Options (AFY)    |  | 4,000 | 48,417 | 117,478 | 225,817 |
| Total Potable Supply Options (AFY) |  | 0     | 35,000 | 75,000  | 134,000 |
| Total of All Options (AFY)         |  | 8,867 | 69,384 | 153,194 | 289,118 |

|              |  |       |        |        |         |
|--------------|--|-------|--------|--------|---------|
| Type 1 Needs |  | 2,757 | 9,552  | 13,614 | 21,635  |
| Type 2 Needs |  | 4,443 | 13,691 | 65,571 | 90,435  |
| Type 3 Needs |  | 0     | 0      | 0      | 170,400 |
| Total Needs  |  | 7,199 | 23,242 | 79,185 | 282,470 |

|                                                                  |  |       |        |        |         |
|------------------------------------------------------------------|--|-------|--------|--------|---------|
| Additional Supply or Demand Options Required to meet Water Needs |  | -     | -      | -      | -       |
| Total Supplies Available to meet Type 2 Water Needs              |  | -     | 35,000 | 75,000 | 134,000 |
| Additional Supply Side Options Required to Meet Type 2 Need      |  | 4,443 | -      | -      | -       |

|                                       |  |       |        |        |         |
|---------------------------------------|--|-------|--------|--------|---------|
| Options Available to meet Type 1 need |  | 100   | 6,695  | 17,968 | 39,803  |
| Options Available to meet Type 2 need |  | -     | 35,000 | 75,000 | 134,000 |
| Options Available to meet Type 3 need |  | 8,767 | 27,689 | 60,226 | 115,314 |

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| #                         | Options             | Decentralized Option Parameters |           |     |     |     |               |                                           | CDM Portfolio Tool Parameters |                      | Minimize Implementation Challenges |                 |                         |                    |                    |                    |                    |        |
|---------------------------|---------------------|---------------------------------|-----------|-----|-----|-----|---------------|-------------------------------------------|-------------------------------|----------------------|------------------------------------|-----------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------|
|                           |                     | Sub-Option / Scenario           | SFR       | MFR | COM | COA | End Uses      | Type of New Development Option Applies To | Resiliency Score              | Implemen. Challenges | On?                                | Implement. Year | Decent. Saturation Rate | 2020 Yield (AF/Yr) | 2040 Yield (AF/Yr) | 2070 Yield (AF/Yr) | 2115 Yield (AF/Yr) |        |
| Demand Management Options | D1                  | AMI                             |           |     |     |     |               |                                           |                               | High                 | 4                                  | ✓               | 2020                    |                    | 596                | 3,882              | 5,766              | 9,371  |
|                           | D2                  | Water Loss Control              |           |     |     |     |               |                                           |                               | High                 | 4                                  | ✓               | 2020                    |                    | 3,108              | 9,326              | 10,918             | 13,064 |
|                           | D3                  | CII Ordinances                  |           |     |     |     |               |                                           |                               | High                 | 4                                  | ✓               | 2020                    |                    | 1,063              | 1,063              | 1,063              | 1,063  |
|                           | D4                  | Benchmarking                    |           |     |     |     |               |                                           |                               | High                 | 2                                  | ✓               | 2020                    |                    | -                  | 5,953              | 11,670             | 25,228 |
|                           | D5                  | Landscape Ordinance             |           |     |     |     |               |                                           |                               | Medium               | 2                                  | ✓               | 2020                    |                    | -                  | 3,038              | 7,428              | 15,050 |
|                           | D6                  | Landscape Incentive             |           |     |     |     |               |                                           |                               | Medium               | 3                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D7                  | Irrigation Incentive            |           |     |     |     |               |                                           |                               | Medium               | 3                                  | ✓               | 2040                    |                    | -                  | 207                | 434                | 401    |
|                           | D8                  | Lot Scale Stormwater Harvesting | Outdoor   |     | Y   |     |               | IRR                                       | All                           | Medium               | 2                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     |     | Y   |               | IRR                                       | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     | Y   |     |               | IRR TL CW                                 | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL CW HVC                             | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D9                  | Lot Scale Rainwater Harvesting  | Outdoor   | Y   |     |     |               | IRR                                       | All                           | Medium               | 2                                  | ✓               | 2040                    | 20%                | -                  | 468                | 1,205              | 2,544  |
|                           |                     |                                 | Outdoor   |     | Y   |     |               | IRR                                       | All                           |                      |                                    | ✓               | 2040                    | 20%                | -                  | 107                | 302                | 850    |
|                           |                     |                                 | Outdoor   |     |     | Y   |               | IRR                                       | All                           |                      |                                    | ✓               | 2040                    | 30%                | -                  | 247                | 626                | 1,493  |
|                           |                     |                                 | Dual pipe | Y   |     |     |               | IRR TL CW                                 | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     | Y   |     |               | IRR TL                                    | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL HVC                                | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Potable   | Y   |     |     |               | ALL                                       | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D10                 | Gray Water Harvesting           | Outdoor   | Y   |     |     |               | IRR                                       | All                           | High                 | 2                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     | Y   |     |               | IRR                                       | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     |     | Y   |               | IRR                                       | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe | Y   |     |     |               | IRR TL CW                                 | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     | Y   |     |               | IRR TL CW                                 | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL                                    | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D11                 | Building Scale Wastewater Reuse | Dual pipe |     | Y   |     |               | IRR TL CW                                 | All                           | High                 | 2                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL CW HVC                             | All                           |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | D12                 | AC Condensate Reuse             |           |     |     |     |               |                                           |                               | High                 | 2                                  | ✓               | 2020                    |                    | 100                | 1,084              | 2,711              | 5,150  |
| Supply Options            | S1                  | Aquifer Storage and Recovery    |           |     |     |     |               |                                           |                               | High                 | 3                                  |                 |                         |                    |                    |                    |                    |        |
|                           |                     |                                 |           |     |     |     |               |                                           |                               |                      |                                    | ✓               | 2040                    |                    | -                  | 30,000             | 30,000             | 60,000 |
|                           | S2                  | Brackish Groundwater Desal      |           |     |     |     |               |                                           |                               | Medium               | 2                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S3                  | Direct Non-Potable Reuse        |           |     |     |     |               |                                           |                               | High                 | 4                                  | ✓               | 2020                    |                    | 4,000              | 12,000             | 25,000             | 54,600 |
|                           | S4                  | Direct Potable Reuse            |           |     |     |     |               |                                           |                               | High                 | 1                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S5                  | Indirect Potable Reuse          |           |     |     |     |               |                                           |                               | High                 | 2                                  | ✓               | 2070                    |                    | -                  | -                  | 10,000             | 20,000 |
|                           | S6                  | LCRA Additional Supply          |           |     |     |     |               |                                           |                               | Low                  | 5                                  | ✓               | 2115                    |                    | -                  | -                  | -                  | 42,000 |
|                           | S7                  | Off Channel Reservoir           |           |     |     |     |               |                                           |                               | Medium               | 3                                  | ✓               | 2070                    |                    | -                  | -                  | 25,827             | 25,827 |
|                           | S8                  | Seawater Desal                  |           |     |     |     |               |                                           |                               | High                 | 1                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S9                  | Distributed WW Reuse            | Dual pipe | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Greenfield                    | High                 | 3                                  | ✓               | 2070                    | 20%                | -                  | 1,055              | 8,025              | 16,989 |
|                           | S10                 | Sewer Mining                    | Outdoor   |     |     |     | Y             | IRR                                       | NA                            | High                 | 2                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Mainly Brownfield             |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
|                           | S11                 | Community Stormwater            | Outdoor   |     |     |     | Y             | IRR                                       | NA                            | Medium               | 3                                  |                 |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   | Y   | Y   | Y   | Y             | IRR                                       | Green&Brownfield              |                      |                                    |                 |                         |                    | -                  | -                  | -                  | -      |
| Dual pipe                 |                     |                                 | Y         | Y   | Y   | Y   | IRR TL CW HVC | Green&Brownfield                          |                               |                      |                                    |                 |                         | -                  | -                  | -                  | -                  |        |
| S12                       | Community Rainwater | Dual pipe                       | Y         | Y   | Y   | Y   | IRR TL CW HVC | Greenfield                                | Medium                        | 2                    |                                    |                 |                         | -                  | -                  | -                  | -                  |        |

|                                    |  |       |        |         |         |
|------------------------------------|--|-------|--------|---------|---------|
| Total Demand Side Options (AFY)    |  | 4,867 | 25,377 | 42,123  | 74,213  |
| Total Supply Side Options (AFY)    |  | 4,000 | 42,000 | 98,852  | 219,416 |
| Total Potable Supply Options (AFY) |  | 0     | 30,000 | 65,827  | 147,827 |
| Total of All Options (AFY)         |  | 8,867 | 67,377 | 140,975 | 293,629 |

|              |  |       |        |        |         |
|--------------|--|-------|--------|--------|---------|
| Type 1 Needs |  | 2,757 | 9,331  | 13,294 | 21,089  |
| Type 2 Needs |  | 4,443 | 12,279 | 63,521 | 89,889  |
| Type 3 Needs |  | 0     | 0      | 0      | 170,400 |
| Total Needs  |  | 7,199 | 21,610 | 76,815 | 281,379 |

|                                                                  |  |       |        |        |         |
|------------------------------------------------------------------|--|-------|--------|--------|---------|
| Additional Supply or Demand Options Required to meet Water Needs |  | -     | -      | -      | -       |
| Total Supplies Available to meet Type 2 Water Needs              |  | -     | 30,000 | 65,827 | 105,827 |
| Additional Supply Side Options Required to Meet Type 2 Need      |  | 4,443 | -      | -      | -       |

|                                       |  |       |        |        |         |
|---------------------------------------|--|-------|--------|--------|---------|
| Options Available to meet Type 1 need |  | 100   | 1,084  | 2,711  | 5,150   |
| Options Available to meet Type 2 need |  | -     | 30,000 | 65,827 | 105,827 |
| Options Available to meet Type 3 need |  | 8,767 | 36,293 | 72,438 | 182,652 |

Summary of Draft Initial Portfolios

11/7/2017

| #                         | Options             | Decentralized Option Parameters |           |     |     |     |               |                                           | CDM Portfolio Tool Parameters |                      |     | Maximize Local Control |                         |                    |                    |                    |                    |        |
|---------------------------|---------------------|---------------------------------|-----------|-----|-----|-----|---------------|-------------------------------------------|-------------------------------|----------------------|-----|------------------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------|
|                           |                     | Sub-Option / Scenario           | SFR       | MFR | COM | COA | End Uses      | Type of New Development Option Applies To | Resiliency Score              | Implemen. Challenges | On? | Implement. Year        | Decent. Saturation Rate | 2020 Yield (AF/Yr) | 2040 Yield (AF/Yr) | 2070 Yield (AF/Yr) | 2115 Yield (AF/Yr) |        |
| Demand Management Options | D1                  | AMI                             |           |     |     |     |               |                                           |                               | High                 | 4   | ✓                      | 2020                    |                    | 596                | 3,882              | 5,766              | 9,371  |
|                           | D2                  | Water Loss Control              |           |     |     |     |               |                                           |                               | High                 | 4   | ✓                      | 2020                    |                    | 3,108              | 9,326              | 10,918             | 13,064 |
|                           | D3                  | CII Ordinances                  |           |     |     |     |               |                                           |                               | High                 | 4   | ✓                      | 2020                    |                    | 1,063              | 1,063              | 1,063              | 1,063  |
|                           | D4                  | Benchmarking                    |           |     |     |     |               |                                           |                               | High                 | 2   | ✓                      | 2020                    |                    | -                  | 5,953              | 11,670             | 25,228 |
|                           | D5                  | Landscape Ordinance             |           |     |     |     |               |                                           |                               | Medium               | 2   | ✓                      | 2020                    |                    | -                  | 3,038              | 7,428              | 15,050 |
|                           | D6                  | Landscape Incentive             |           |     |     |     |               |                                           |                               | Medium               | 3   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | D7                  | Irrigation Incentive            |           |     |     |     |               |                                           |                               | Medium               | 3   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | D8                  | Lot Scale Stormwater Harvesting | Outdoor   |     | Y   |     |               | IRR                                       | All                           | Medium               | 2   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     |     | Y   |               | IRR                                       | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     | Y   |     |               | IRR TL CW                                 | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL CW HVC                             | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | D9                  | Lot Scale Rainwater Harvesting  | Outdoor   | Y   |     |     |               | IRR                                       | All                           | Medium               | 2   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     | Y   |     |               | IRR                                       | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     |     | Y   |               | IRR                                       | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe | Y   |     |     |               | IRR TL CW                                 | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     | Y   |     |               | IRR TL                                    | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL HVC                                | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Potable   | Y   |     |     |               | ALL                                       | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 |           |     |     |     |               |                                           |                               |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | D10                 | Gray Water Harvesting           | Outdoor   | Y   |     |     |               | IRR                                       | All                           | High                 | 2   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     | Y   |     |               | IRR                                       | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Outdoor   |     |     | Y   |               | IRR                                       | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe | Y   |     |     |               | IRR TL CW                                 | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     | Y   |     |               | IRR TL CW                                 | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL                                    | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | D11                 | Building Scale Wastewater Reuse | Dual pipe |     | Y   |     |               | IRR TL CW                                 | All                           | High                 | 2   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe |     |     | Y   |               | IRR TL CW HVC                             | All                           |                      |     |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | D12                 | AC Condensate Reuse             |           |     |     |     |               |                                           |                               | High                 | 2   | ✓                      | 2020                    |                    | 100                | 1,084              | 2,711              | 5,150  |
| Supply Options            | S1                  | Aquifer Storage and Recovery    |           |     |     |     |               |                                           |                               | High                 | 3   |                        |                         |                    |                    |                    |                    |        |
|                           |                     |                                 |           |     |     |     |               |                                           |                               |                      |     | ✓                      | 2040                    |                    | -                  | 30,000             | 30,000             | 60,000 |
|                           | S2                  | Brackish Groundwater Desal      |           |     |     |     |               |                                           |                               | Medium               | 2   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | S3                  | Direct Non-Potable Reuse        |           |     |     |     |               |                                           |                               | High                 | 4   | ✓                      | 2020                    |                    | 4,000              | 12,000             | 25,000             | 54,600 |
|                           | S4                  | Direct Potable Reuse            |           |     |     |     |               |                                           |                               | High                 | 1   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | S5                  | Indirect Potable Reuse          |           |     |     |     |               |                                           |                               | High                 | 2   | ✓                      | 2070                    |                    | -                  | -                  | 10,000             | 20,000 |
|                           | S6                  | LCRA Additional Supply          |           |     |     |     |               |                                           |                               | Low                  | 5   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | S7                  | Off Channel Reservoir           |           |     |     |     |               |                                           |                               | Medium               | 3   |                        |                         |                    |                    |                    |                    |        |
|                           |                     |                                 |           |     |     |     |               |                                           |                               |                      |     | ✓                      | 2070                    |                    | -                  | -                  | 25,827             | 25,827 |
|                           | S8                  | Seawater Desal                  |           |     |     |     |               |                                           |                               | High                 | 1   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           | S9                  | Distributed WW Reuse            | Dual pipe | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Greenfield                    | High                 | 3   | ✓                      | 2040                    | 90%                | -                  | 3,391              | 15,144             | 31,602 |
|                           | S10                 | Sewer Mining                    | Outdoor   |     |     |     | Y             | IRR                                       | NA                            | High                 | 2   |                        |                         |                    | -                  | -                  | -                  | -      |
|                           |                     |                                 | Dual pipe | Y   | Y   | Y   | Y             | IRR TL CW HVC                             | Mainly Brownfield             |                      |     | ✓                      | 2040                    | 50%                | -                  | 1,255              | 2,673              | 6,357  |
|                           | S11                 | Community Stormwater            | Outdoor   |     |     |     | Y             | IRR                                       | NA                            | Medium               | 3   | ✓                      | 2040                    | 70%                | -                  | 73                 | 73                 | 73     |
|                           |                     |                                 | Outdoor   | Y   | Y   | Y   | Y             | IRR                                       | Green&Brownfield              |                      |     | ✓                      | 2040                    | 80%                | -                  | 21                 | 43                 | 101    |
| Dual pipe                 |                     |                                 | Y         | Y   | Y   | Y   | IRR TL CW HVC | Green&Brownfield                          | ✓                             |                      |     | 2040                   | 80%                     | -                  | 174                | 324                | 700                |        |
| S12                       | Community Rainwater | Dual pipe                       | Y         | Y   | Y   | Y   | IRR TL CW HVC | Greenfield                                | Medium                        | 2                    | ✓   | 2040                   | 100%                    | -                  | 16                 | 17                 | 24                 |        |

|                                    |  |       |        |         |         |
|------------------------------------|--|-------|--------|---------|---------|
| Total Demand Side Options (AFY)    |  | 4,867 | 24,347 | 39,556  | 68,926  |
| Total Supply Side Options (AFY)    |  | 4,000 | 46,929 | 109,101 | 199,285 |
| Total Potable Supply Options (AFY) |  | 0     | 30,000 | 65,827  | 105,827 |
| Total of All Options (AFY)         |  | 8,867 | 71,277 | 148,657 | 268,210 |

|              |  |       |        |        |         |
|--------------|--|-------|--------|--------|---------|
| Type 1 Needs |  | 2,757 | 9,383  | 13,422 | 21,354  |
| Type 2 Needs |  | 4,443 | 12,609 | 64,342 | 90,154  |
| Type 3 Needs |  | 0     | 0      | 0      | 170,400 |
| Total Needs  |  | 7,199 | 21,991 | 77,764 | 281,907 |

|                                                                  |  |       |        |        |         |
|------------------------------------------------------------------|--|-------|--------|--------|---------|
| Additional Supply or Demand Options Required to meet Water Needs |  | -     | -      | -      | 13,697  |
| Total Supplies Available to meet Type 2 Water Needs              |  | -     | 30,000 | 65,827 | 105,827 |
| Additional Supply Side Options Required to Meet Type 2 Need      |  | 4,443 | -      | -      | -       |

|                                       |  |       |        |        |         |
|---------------------------------------|--|-------|--------|--------|---------|
| Options Available to meet Type 1 need |  | 100   | 1,084  | 2,711  | 5,150   |
| Options Available to meet Type 2 need |  | -     | 30,000 | 65,827 | 105,827 |
| Options Available to meet Type 3 need |  | 8,767 | 39,909 | 79,662 | 156,335 |