



STRATECON
INC.

Rodney T. Smith, Ph.D. President

Reasonable Ratio of M&I to AG Groundwater Extraction Charges

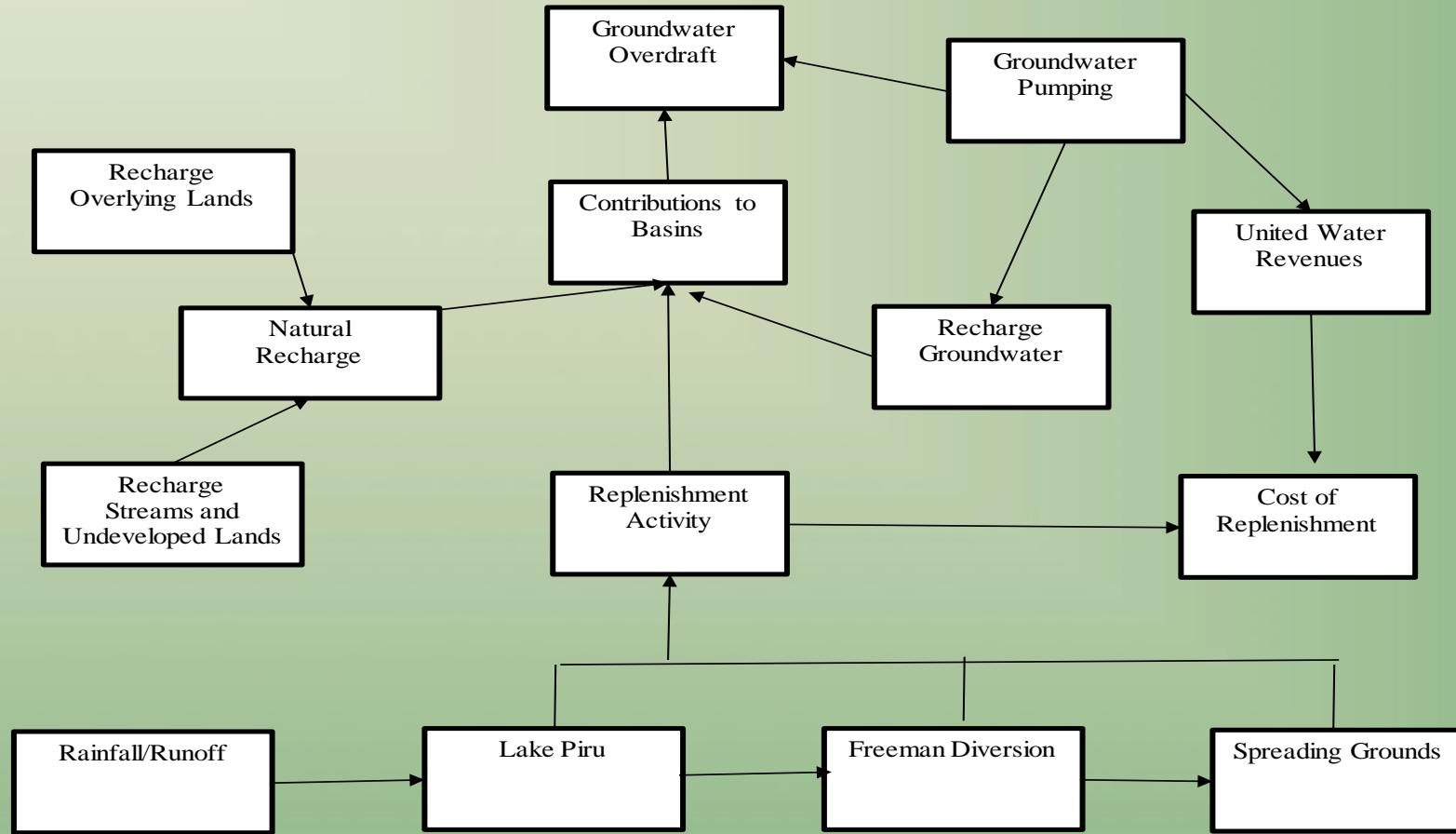
United Water Conservation District
Santa Paula, CA
May 23, 2019

Statement of Question

- Develop a quantitative method to determine a reasonable ratio of groundwater extraction charges Municipal & Industrial (“non-agricultural”) water to agricultural (“AG”) water
 - ❑ Focus on the differential hydrological impact of M&I and AG groundwater usage and land use on the eight inter-connected basins within United
 - ❑ How differential hydrological impact creates a need for replenishment projects and activities from United
 - ❑ How the rate structure should reflect these differences

Economic Principles of Rate Structure

United Water's Objectives and Sources of Revenues and Costs



Principle 1: Components of Fee for Water User Class

- $\text{Fee} = \text{Variable Cost Component} + \text{Fixed Cost Component}$
- **Variable Cost Component:** replenishment costs that vary with the volume of replenishment projects and activities (estimated @ 10% of total replenishment costs)
- **Fixed Cost Component:** replenishment costs that do not vary with the volume of replenishment projects and activities (estimated @ 90% of total replenishment costs)

Principle 2: Variable Cost Component Based on Impact of Pumping on Overdraft

- Impact of pumping on overdraft: pumping less groundwater reuse

AG Variable Cost Component: 75.9% of variable cost

M&I Variable Cost Component: 85.2% of variable cost

Principle 3: Fixed Cost Component based on apportionment rules

- Rule 1: apportion fixed cost according to relative demands water user class places on United for replenishment projects and activities
 - ❑ Share based on groundwater pumping adjusted for reuse
- Rule 2: credit water user class based on amount of differential recharge on overlying lands relative to districtwide average
 - ❑ Differential recharge per acre: AG (0.07 AF/acre); M&I (-0.14 AF/acre) adjusted by portion of recharge that benefits the inter-connected basins
 - ❑ Annual cost of replenishment projects and activities

Consistent With Cost-of-Service, Rate-Making Principles

- United Water undertakes projects to mitigate the effects of groundwater overdraft
- For a parcel, demand for United Water's services reflect water use and land use
- Stratecon's method
 - ❑ United Water's variable cost: comparable to commodity charge
 - ❑ United Water's fixed cost: comparable to demand charge

United Water's Cost of Replenishment Projects and Activities

United Water Projects to Address Groundwater Overdraft

- Ferro/Rose (retirement of groundwater allocation)
 - ❑ annual cost of replenishment activity: \$1,220 per acre-foot (firm replenishment)
- Ferro/Rose (recharge project)
 - ❑ annual capital cost of replenishment activity: \$919/acre-foot (non-firm replenishment)
- Desalination of brackish groundwater project (annual cost)
 - For 10,000 acre-foot annual design capacity: \$1,300 per acre-foot to \$1,495 per acre-foot
 - For 20,000 acre-foot annual design capacity: \$1,168 per acre-foot to \$1,326 per-acre foot

Other Water Initiatives in Ventura County

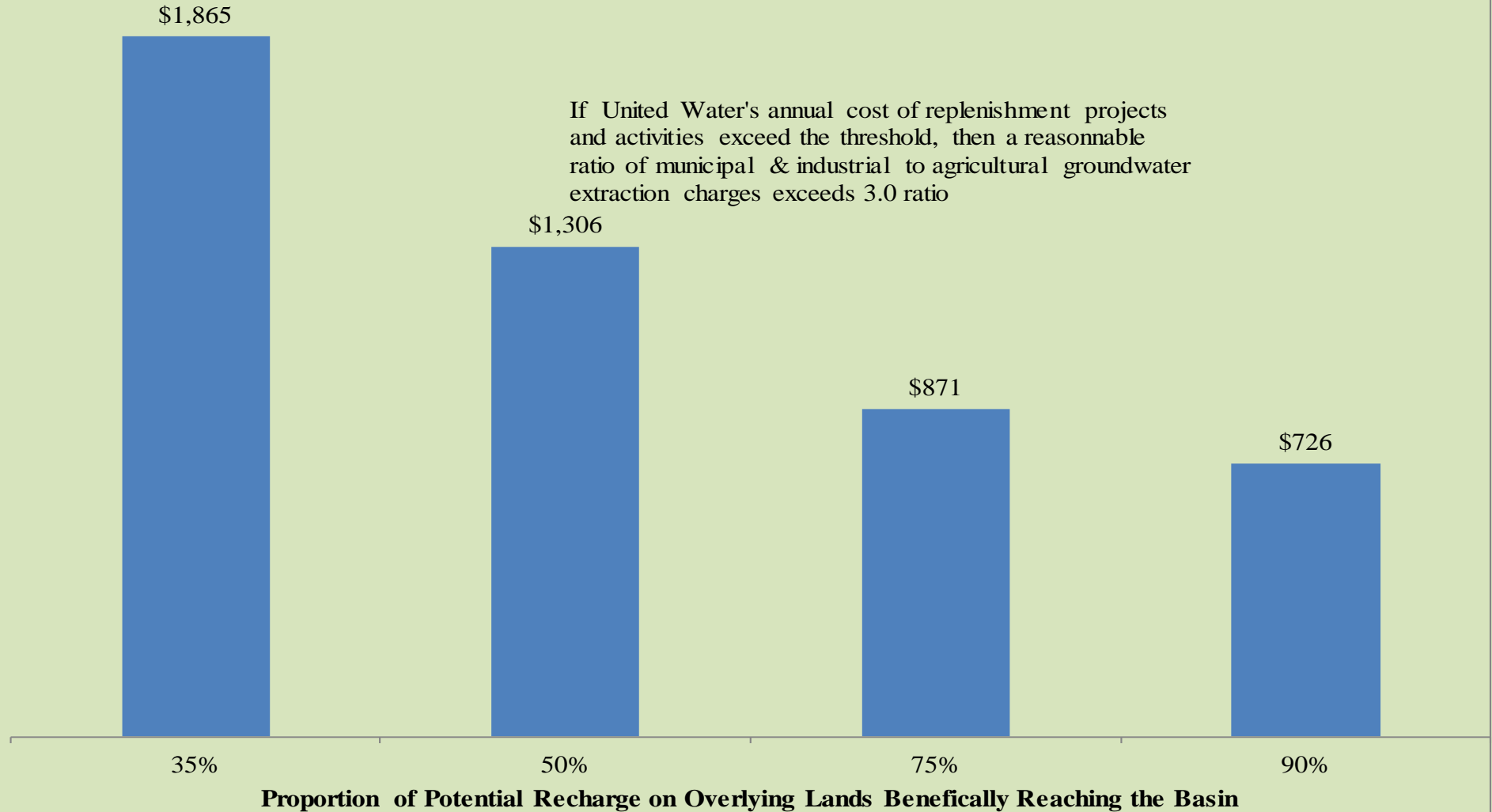
- City of Ventura “Water Rights Dedication and Water Resources Net Zero Fee Ordinance”
 - ❑ Estimated fee for 2019: \$29,135
 - ❑ Annual cost of \$1,779 per acre foot
- Fox Canyon Groundwater Management Agency surcharge to bring pumping to safe yield
 - ❑ \$1,961/AF for excess pumping of more than 100 acre feet per year
- Casitas Connection to State Water Project (annual cost per expected yield)
 - Capital Cost: \$1,491/AF
 - Replacement Cost: \$242/AF
 - SWP charges: \$1,170/AF
 - Total: \$2,903/AF

Reasonable Ratio for Groundwater Extraction Charges

Assumptions

- Groundwater Revenue including in-lieu: \$18,166,030
- Groundwater pumping and in-lieu: agricultural (143,260 acre-feet) and municipal & industrial (34,540 acre feet)
- Hydrologic Conditions
 - ❑ Reuse of groundwater: agricultural (24.1%) and municipal & industrial (14.8%)
 - ❑ Overlying recharge for lands: agricultural (0.56 acre-feet per acre) and municipal & industrial (0.35 acre-feet per acre)
- Acreage: Agricultural (80,078 acres) and Municipal & Industrial (40,918 acres)

Figure 2
Threshold Annual Cost of Replenishment Projects and Activities by
Proportion of Potential Recharge on Overlying Lands Beneficially Reaching the Basin
(\$/AF)



Conclusion

- A ratio of at least 3.0 for M&I to AG groundwater extraction charges reasonably reflects the quantitative differences between the hydrologic impacts of the different water user classes