

**Lower Santa Cruz River Basin Study**  
**DRAFT Scenarios - revised per comments through webinar on 3/1/17**

These scenarios are being formulated to envision a range of conditions in the LSCR Basin (Tucson Active Management Area) without active adaptation measures.  
The "without adaptation" scenarios are being developed to provide specific input to:  
CAP's Service Area Model (CAP-SAM), the surface hydrologic model (Sacramento-Soil Moisture Accounting Model) and the groundwater model (Tucson AMA Modflow Model).

		Low Risk -----(building blocks)----->High Risk				
Driving Forces	Official/Baseline Values	Slow Compact Growth	Slow Outward Growth	Rapid Outward Growth	Rapid Outward Growth Plus Mining without Replenishment	Comments for Discussion
<b>Demand Scenarios Summary</b>	Growth rate based on Medium growth series from the AZ Dept. of Administration and growth pattern from PAG, standard CAP-SAM assumptions	Growth rate based on Low growth series from AZ Dept. of Administration, and condensed growth pattern in CAP-SAM. No additional mines, Green Valley area eliminates overdraft	Growth rate based on Medium growth series from AZ Dept. of Administration, and outward growth pattern in CAP-SAM, expected mine development with replenishment in Green Valley	Growth rate based on High growth series from AZ Dept. of Administration, and outward growth pattern in CAP-SAM, expected mine development with replenishment in Green Valley	Growth rate based on High growth series from the State, and outward growth pattern in CAP-SAM, mining growth w/o replenishment in Green Valley	
<b>Municipal Demand: Population Growth Rate</b>	Medium	Low Series	Medium Series	High Series	High Series	Arizona Department of Administration Population Series Projections <a href="https://population.az.gov/population-projections">https://population.az.gov/population-projections</a>
<b>Municipal Demand: Growth Pattern - Infill vs. Outward Growth</b>	Baseline	In-Fill/Redevelopment	Slow Outward	Rapid Outward	Rapid Outward	Assumes outward growth will be dependent on groundwater needing replenishment outside area of hydrologic impact; and in-fill growth will use renewable water sources served directly
<b>Municipal Demand: Residential demand - Gallons Per Household Unit</b>	Decline as expected	Decline faster than expected	Decline as expected	No change in current GPHUD	No change in current GPHUD	Reflects current water conservation trends expressed in gallons per housing unit demand
<b>Agricultural Demand: Consumptive Use (CU) of Crop Type</b>	Baseline	Some ag areas convert to low consumptive use crops	No change in consumptive use of crops	Some ag areas convert to higher consumptive use crops	Some ag areas convert to higher consumptive use crops	Ag Sub-team reports that current level of farming will continue with acreage approximately constant unless replaced by development.
<b>Agricultural Demand: Development on Ag Land versus Undeveloped Land</b>	Baseline	Low GPHUD development tends to replace high water use ag land.	CAP-SAM Baseline	Higher GPHUD development occurs on undeveloped land before replacing agriculture	Higher GPHUD development occurs on undeveloped land before replacing agriculture	CAP-SAM allows adjustment of preference for development on ag or undeveloped land; model will use current FICO build-out estimates
<b>Industrial Demand: Manufacturing</b>	Baseline	Slow economic growth and/or greatly improved water use efficiency	Moderate economic growth within existing water service areas, expected improvements in efficiency	Rapid economic growth that depends on groundwater, minimal improvements in efficiency	Rapid economic growth that depends on groundwater, minimal improvements in efficiency	Assumes outward growth will be dependent on groundwater replenished outside area of hydrologic impact; in-fill growth will use renewable water sources. Manufacturing assumed to grow in proportion to population in each service area.
<b>Environmental Demand: Riparian Evapotranspiration</b>	8,000 acre-feet per year	Initially 8,000 acre-feet a year, changing with temperatures specified in climate scenario, surface and shallow groundwater availability	Initially 8,000 acre-feet a year, changing with temperatures specified in climate scenario, surface and shallow groundwater availability	Initially 8,000 acre-feet a year, changing with temperatures specified in climate scenario, surface and shallow groundwater availability	Initially 8,000 acre-feet a year, changing with temperatures specified in climate scenario, surface and shallow groundwater availability	Value from estimate in ADWR Tucson Active Management Area Model Report #24, page 14. Will be adjusted according to selected climate scenarios.
<b>DRAFT Without Adaptation Demand Scenarios - Green Valley Detail</b>						
<b>ASARCO Groundwater Pumping (AFY)</b>	6,000 AFY	6,000 AFY	6,000 AFY	6,000 AFY	6,000 AFY	Value from Bob Hedden, Chairman of Upper Santa Cruz Providers and Users Group, subject to impacts to shortages of Tohono O'odham CAP water allocation leased to ASARCO.
<b>Sierrita (Freeport) Groundwater Pumping (AFY)</b>	23,000 AFY	period of reduced pumping, then resumption to 23,000 AFY, per ADEQ plan	23,000 AFY	23,000 AFY	23,000 AFY	Rounded number from 2013 Freeport NIA allocation application, see ADEQ reference
<b>Rosemont Mine Groundwater Pumping (AFY)</b>	6,000 AFY	0 AFY	6,000 AFY	6,000 AFY	6,000 AFY	Number from ADWR groundwater permit, per Rosemont EIS, life of mine is 24.5 to 30 years.
<b>Initial Year of Rosemont Mine Operation</b>	per current CAP-SAM assumptions	Never	Year 2030	Year 2020	Year 2020	Per Rosemont application to ADWR for Central Arizona Project Non-Indian Agricultural Water Allocation.
<b>Initial Year of Rosemont Mine Replenishment (1,124 AFY NIA CAP Water)</b>	per current CAP-SAM assumptions	Never	Year 2020	Year 2030	Never	Linked to date of Rosemont Mine operation. Rosemont uses Itsc first
<b>Initial Year of Local Green Valley M&amp;I CAP Local Use (4,758 AFY)</b>	per current CAP-SAM assumptions	Year 2020	Year 2030	Year 2030	Never	Plan is to recharge water at Project Renews site in Green Valley area, funded by Rosemont Mine owner. Therefore, linked to date of Rosemont Mine operation
<b>FICO Groundwater Savings Facility - ultimate capacity (AFY)</b>	per current CAP-SAM assumptions	22,000 AFY	22,000 AFY	11,000 AFY	0 AFY	Phases I & II permitted for 11,000 AFY each; Interacts with urbanization of FICO land. (Urbanization of FICO land will displace Groundwater Savings Facility.)
<b>Initial Year of FICO Groundwater Savings Facility</b>	per current CAP-SAM assumptions	Year 2018	Year 2018	Year 2025	Never	Tied to year of putting CAP agricultural pool water to use, provided it is available.
<b>Other Green Valley area mining or increased intensity, % of current pumping</b>	per current CAP-SAM assumptions	0%	0%	30%	30%	Sierrita mine expansion plan may mean additional groundwater pumping, potential for increased intensity at existing mines.