

The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The largest droplet is at the top center, and another large one is on the right side. Smaller droplets are scattered throughout the rest of the page.

REVIEW POTENTIAL WATER MANAGEMENT OPTIONS

BOARD OF DIRECTORS MEETING
JULY 21, 2020
ITEM 7

OUTLINE

Current Reliability

- 2017 Water Reliability Report
- Updates

Review Potential Water Management Actions

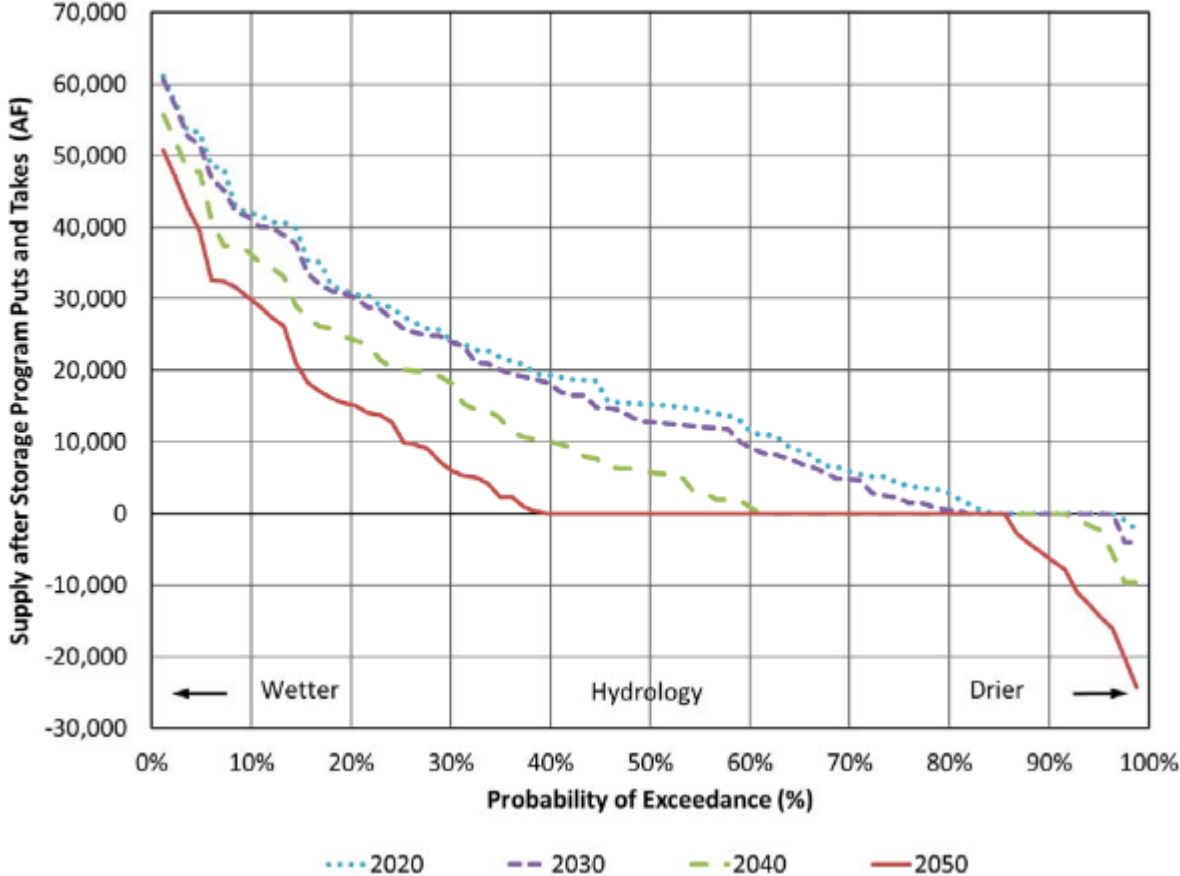
- Sites Reservoir
- Devil's Den Surface Storage
- Semitropic (NLF)
- Supplemental Rosedale Banking Program Recovery
- AVEK Groundwater Banking Program
- Recycled Water
- Other's not analyzed (Modesto Bank)

2017 WATER SUPPLY RELIABILITY REPORT

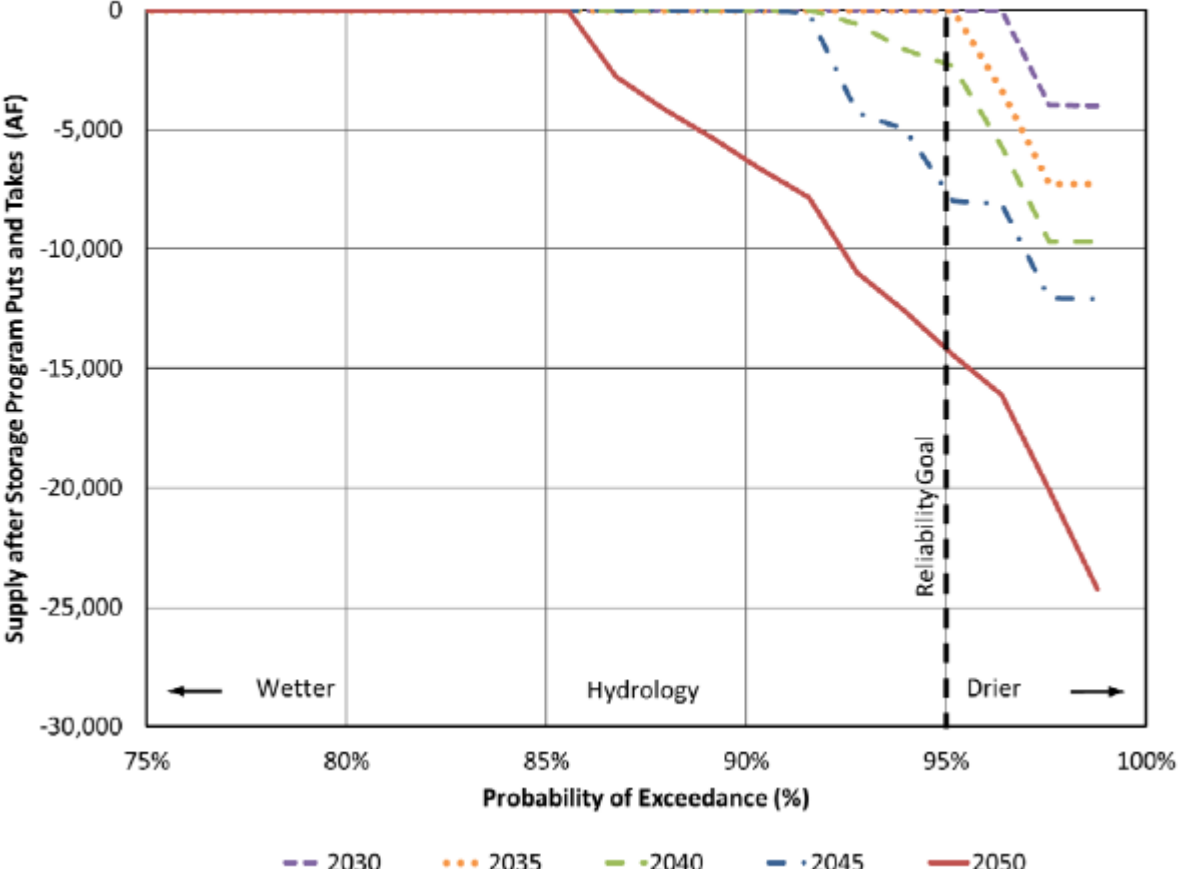
- ALTERNATIVES ANALYZED
 - BASE CASE – 2015 UWMP
 - SCENARIO A – UWMP WITH CA WATERFIX
 - SCENARIO B – MODEST REDUCTION IN EXISTING AND ANTICIPATED SUPPLIES
 - SCENARIO C – GREATER REDUCTION IN EXISTING AND ANTICIPATED SUPPLIES
 - DOES NOT INCLUDE:
 - SAUGUS DRY-YEAR WELLS
 - SUPPLEMENTAL ROSEDALE EXTRACTION CAPACITY
 - RW CAPPED AT EXISTING AND NEWHALL RANCH

SCENARIO C RELIABILITY

**FIGURE 3-8
SCENARIO C INITIAL RELIABILITY**



**FIGURE 3-9
SCENARIO C INITIAL RELIABILITY: DETAIL OF SUPPLY SHORTFALL**



REVIEW OF RELIABILITY LANDSCAPE

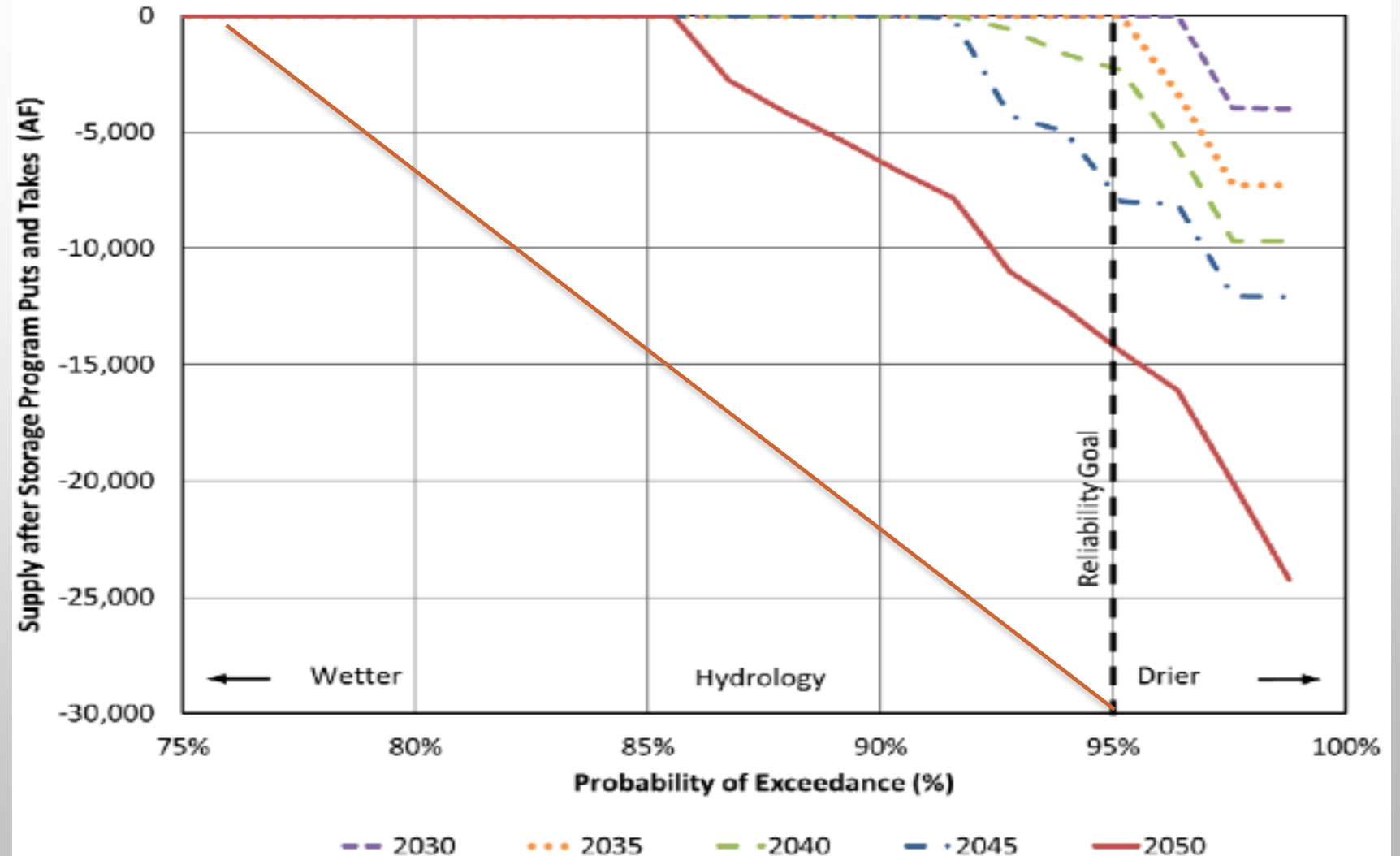
- LANDSCAPE POST 2017
 - CONTINUED PRESSURES ON SWP AND NORTH OF DELTA SUPPLIES
 - 2019 DRAFT SWP DELIVERY CAPABILITY REPORT (AVG. 62>58)
 - NEW COORDINATED OPERATING PERMIT, SWP OPERATING PERMIT (ITP), OROVILLE RESERVOIR TARGET STORAGE
 - DELTA STEWARDSHIP COUNCIL'S DELTA PLAN ENFORCEABILITY
 - SWRCB WATER QUALITY PLAN/VOLUNTARY SETTLEMENT AGREEMENTS
 - VULNERABILITY OF LOCAL GROUNDWATER SUPPLIES
 - CONSTITUENTS OF EMERGING CONCERN (I.E. PFAS THAT IMPACTED ALLUVIAL SUPPLIES BY ABOUT 15 TAF)
 - GROUNDWATER DEPENDENT ECOSYSTEMS IN GSP
 - RECYCLED WATER DEVELOPMENT
 - INSTREAM USES MAY LIMIT APPLICABILITY TO NEW DROP
 - SEASONAL STORAGE
 - LIMITED POTENTIAL FOR GROUNDWATER RECHARGE
 - DELTA STEWARDSHIP COUNCIL'S DELTA PLAN MAY BE A FORCING FUNCTION

ALTERNATIVE RELIABILITY PLANNING OBJECTIVE

A more conservative approach of considering potential supply disruptions would shift the reliability curves down and to the left as illustrated for the repositioned 2050 curve

Currently Dry and Critically Dry years on SWP comprise 35% of the record hydrology

FIGURE 3-9
SCENARIO C INITIAL RELIABILITY: DETAIL OF SUPPLY SHORTFALL



EVALUATION APPROACH TO COMPARE PROJECTS

(COST/AF FOR COMPARISON PURPOSES ONLY)

Scenario C serves as a basis for evaluating future reliability investments

- Doesn't include 2015 planned supplies
- Except for Westside Communities and those are relatively neutral

Consider investing in additional programs as a buffer to:

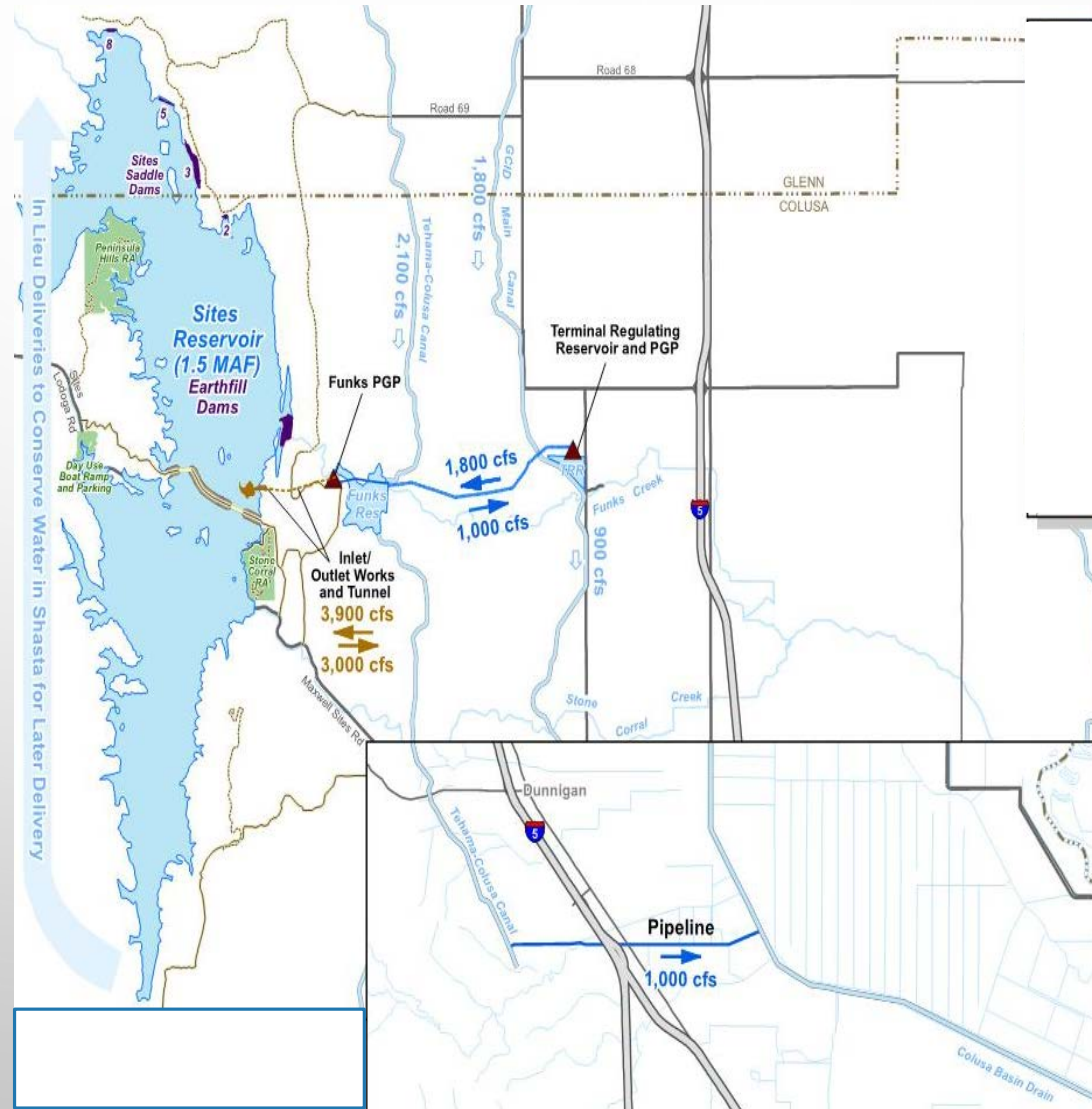
- Supply disruption such as Constituents of Emerging Concern
- Mid and Longer-term climate change

Criteria for reviewing cost effectiveness of additional supplies

- Potential exists for need in Dry and Critically Dry years
- If a project produces water in other year types, it would be marketed

SITES RESERVOIR

RESERVOIR SIZE (MAF)	1.5
PROJECT COST (2019\$, BILLIONS)	\$2.4 – \$2.7
CONTINGENCY COST (2019\$, BILLIONS)	\$0.6
TOTAL PROJECT COST (2019\$, BILLIONS)	\$3.0 - \$3.3
ANNUALIZED AF/YEAR RELEASE (AFY)	240,000
RANGE OF ANNUAL COSTS DURING REPAYMENT WITHOUT WIFIA LOANS (2020\$, \$/AF)	\$650 - \$710
RANGE OF ANNUAL COSTS DURING REPAYMENT WITH WIFIA LOANS (2020\$, \$/AF)	\$600 - \$660

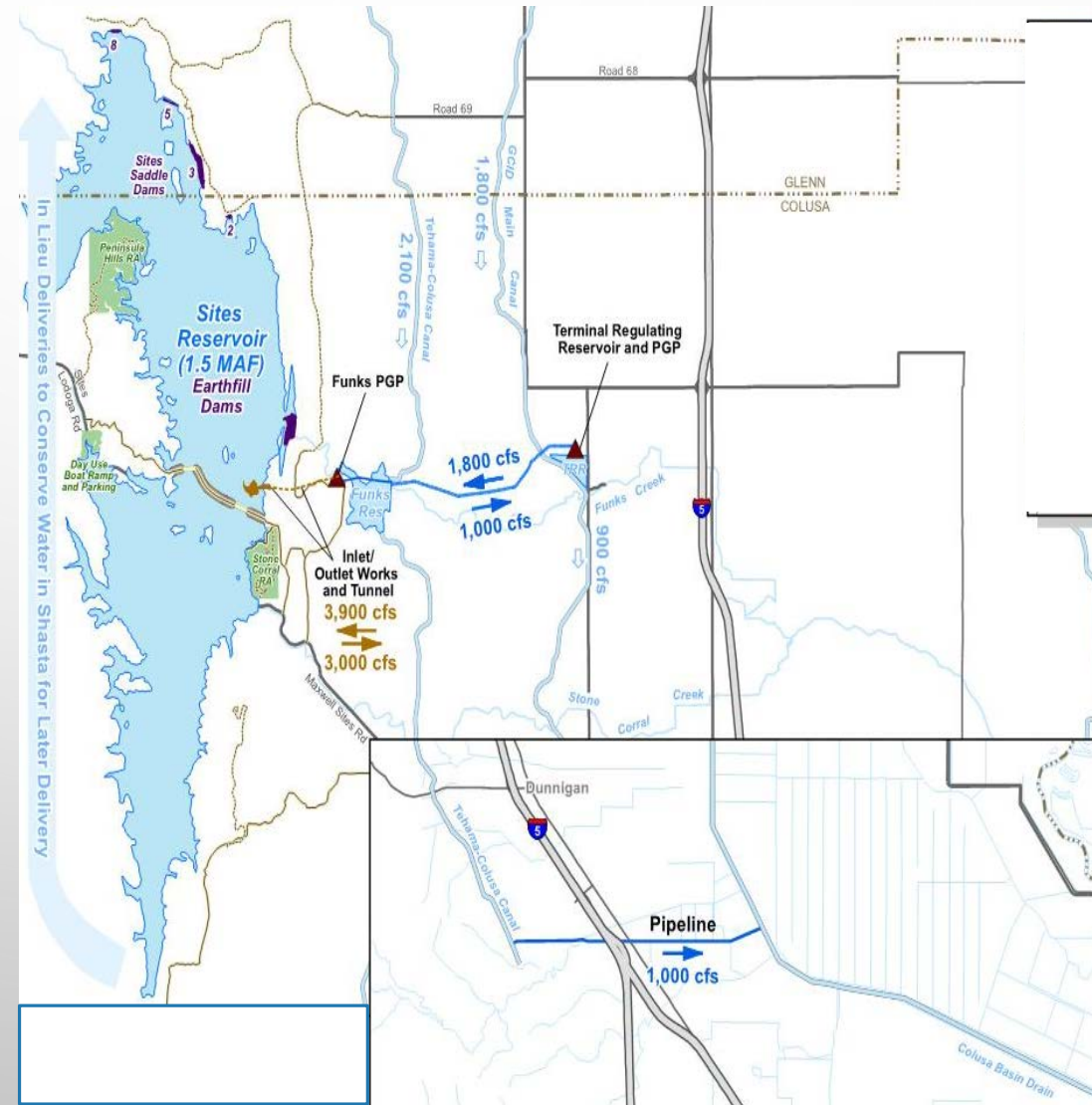


SITES RESERVOIR YIELD AND EFFECTIVE UNIT COST

YEAR TYPE	1,000 cfs RELEASE CAPACITY (AFY) TO THE COLUSA BASIN DRAIN
WET	90 – 120
ABOVE NORMAL	260 – 290
BELOW NORMAL	245 – 275
DRY	355 - 385
CRITICALLY DRY	210 - 240
AVG ANNUAL YIELD	240

RESERVOIR SIZE (MAF)	1.5
ASSUMED SCVWA PARTICIPATION	5,000 AF
WEIGHTED AVG DRY AND CRITICALLY DRY YEAR YIELD	5,900 AF
OTHER YEAR AVG YIELD (FOR POTENTIAL WATER SALES)	3,900 AF
EFFECTIVE UNIT COSTS (NORTH OF DELTA)	\$1,280 / AF

Action needed to continue with planning level participation.



DEVIL'S DEN SURFACE WATER BANKING

- CONSTRUCT SHALLOW NON-JURISDICTIONAL RESERVOIRS TO CAPTURE CARRYOVER WATER SPILL OR ARTICLE 21 WATER
- HIGH LOSSES TO SEEPAGE REQUIRE LINER
- HIGH CAPITAL COSTS AND INFREQUENT USE MAKES THIS PROJECT UNECONOMIC AT THIS TIME (POTENTIAL MAY EXIST WITH A DELTA CONVEYANCE FACILITY)



NEWHALL LAND AND FARMING SEMITROPIC BANK



50,000 AF of storage capacity



4,950 AF of dry-year recovery



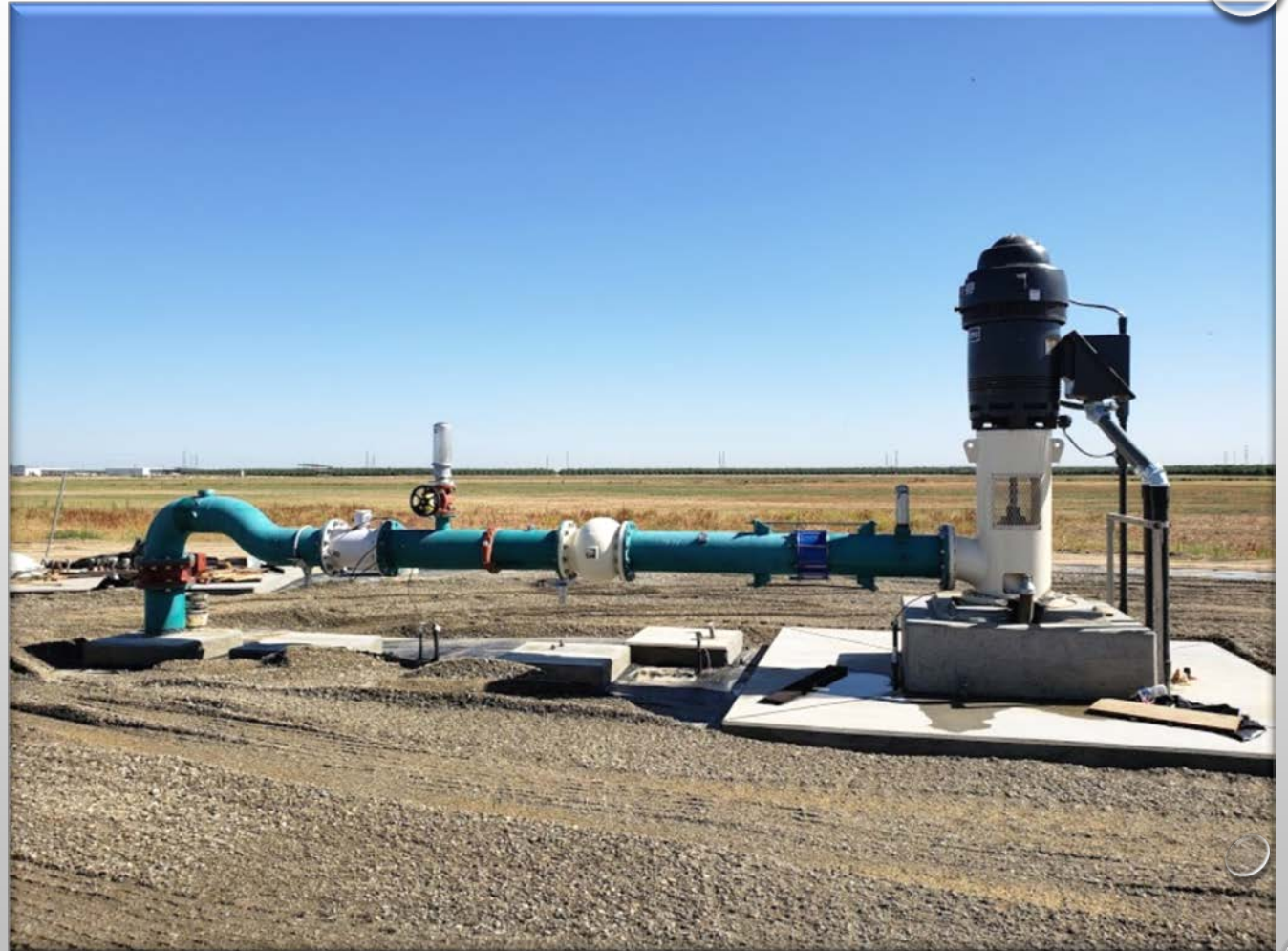
Potential Costs TBD –

Historic Cost \$563/AF (2020)

Includes value of exchange water (\$300/AF)

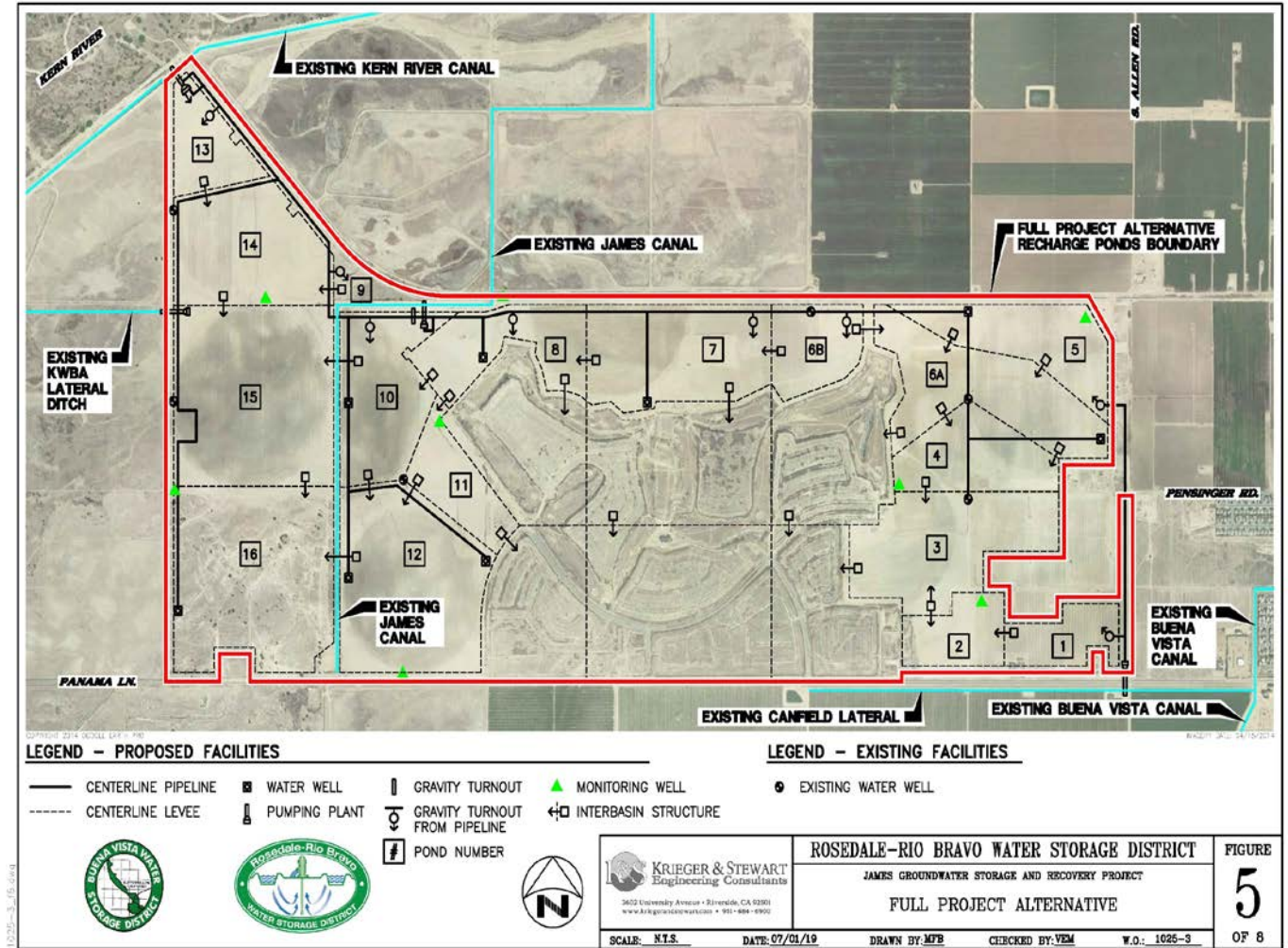
ROSEDALE BANKING – SUPPLEMENTAL EXTRACTION CAPACITY

- CONSTRUCT 4 NEW WELLS AND CONVEYANCE AS PROVIDED IN BANKING AGREEMENT
- ANTICIPATED UNIT COST - \$500/AF (ROUGH ESTIMATE BASED ON DRY-YEAR RECOVERY PROGRAM)
- POTENTIAL FOR MORE COST-EFFECTIVE ALTERNATIVES WITH PARTNERS

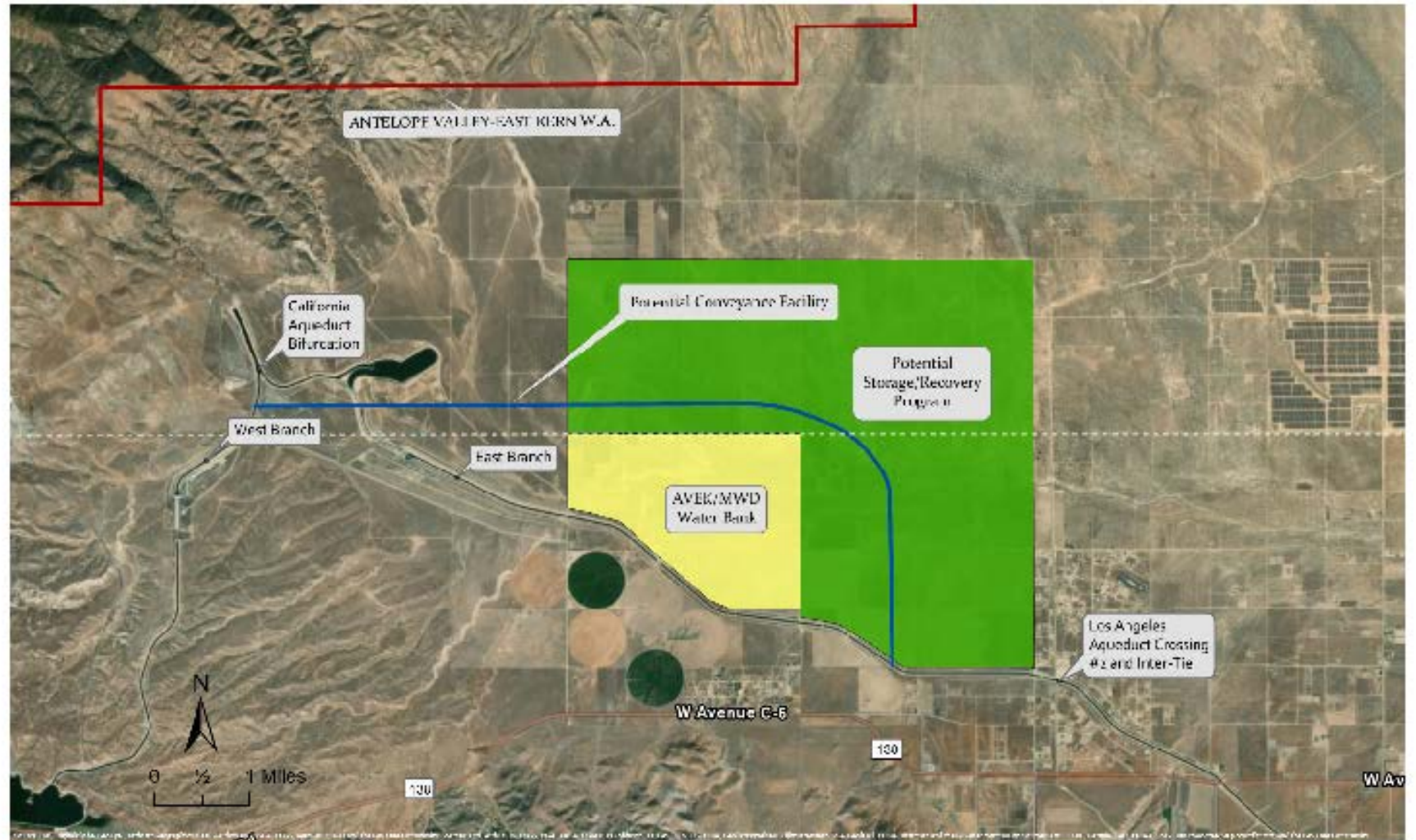


OTHER ROSEDALE BANKING OPPORTUNITIES

- KERN FAN STORAGE PROGRAM
 - PARTNERSHIP WITH IRWD
 - 100 TAF STORAGE CAPACITY
 - 50 TAF ANNUAL RECOVERY
 - 500 CFS CONVEYANCE CAPACITY
- JAMES PROJECT
 - 150,000 AF STORAGE CAPACITY
- COST FOR THESE PROGRAMS ARE UNKNOWN AT THIS TIME



AVEK – PHASE 2 WATER BANK



Conceptual Storage/Recovery Program

- Legend
- Aqueduct
 - Potential Conveyance Facility
 - AVEK/MWD Water Bank
 - Potential Storage/Recovery Program
 - AVEK Service Area Boundary



06-04-2020

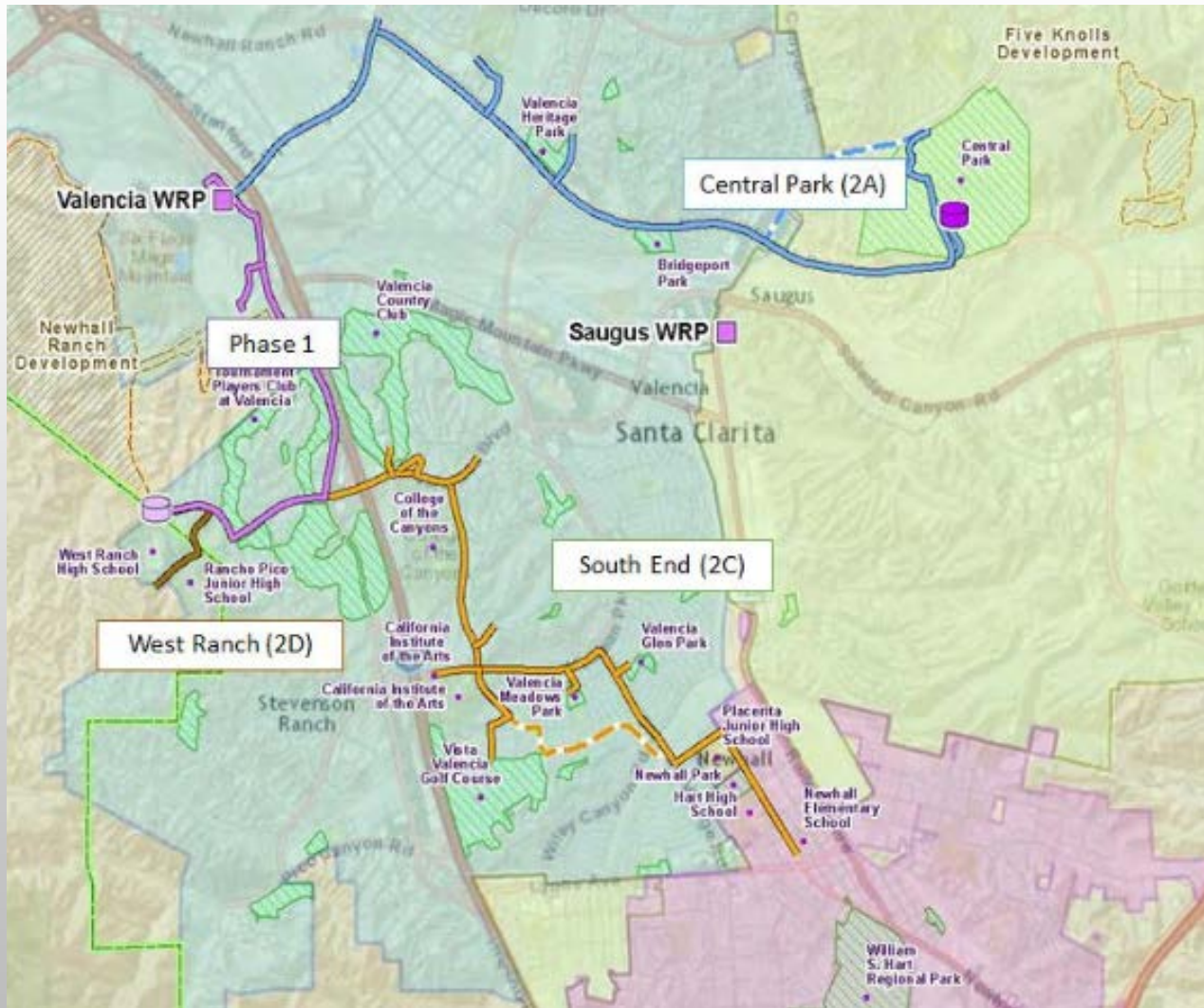
AVEK – HIGH DESERT BANK PHASE 2

- 20 TAF RECOVERY AND 80 TAF STORAGE CAPACITY
- DIRECT DELIVERY TO WEST BRANCH
- SECOND PRIORITY TO MWD/AVEK PHASE 1
- \$38M CAPITAL OR \$117/AF (DISCOUNTED) \$334/AF OF RECOVERED WATER
- ACTUAL PUT AND TAKE COSTS
- ANNUAL O&M FEE
- \$100/AF FOR RECOVERY TO AVEK
- EFFECTIVE UNIT COST - \$550/AF
- SPONSOR READY TO INITIATE PLANNING FOR NEXT PHASE SHOULD SCV WATER PROCEED WITH DISCUSSIONS?



SAUGUS FORMATION DRY YEAR WELLS (SAUGUS WELLS 5 AND 6)

- PART OF 2015 UWMP
- POTENTIAL TO BE MODIFIED TO ASR
- 4,000 - 5000 GPM TOTAL OR ABOUT 5,000 - 6000 AFY (AT 75% CAPACITY)
- TAKES IN CRITICALLY DRY YEARS (PER GW OPERATING PLAN)
- COST – \$10.19 MILLION CAPITAL OR \$625,580/YR (DISCOUNTED)
- \$160/AF OPERATING COSTS
- UNIT COSTS W/O ASR – \$790/AF (OPERATIONS IN CRITICALLY DRY YEARS ONLY)
 - (\$520/AF IF OPERATED IN DRY AND CRITICALLY DRY YEARS)
 - UNIT COSTS W/ASR – TBD



PHASE 2-A RECYCLED WATER

- APPROXIMATELY \$18.7 MILLION IN CAPITAL
- YIELD – 560 AF
- ADJUSTED UNIT COST OF \$3,800/AF FOR RECYCLED WATER

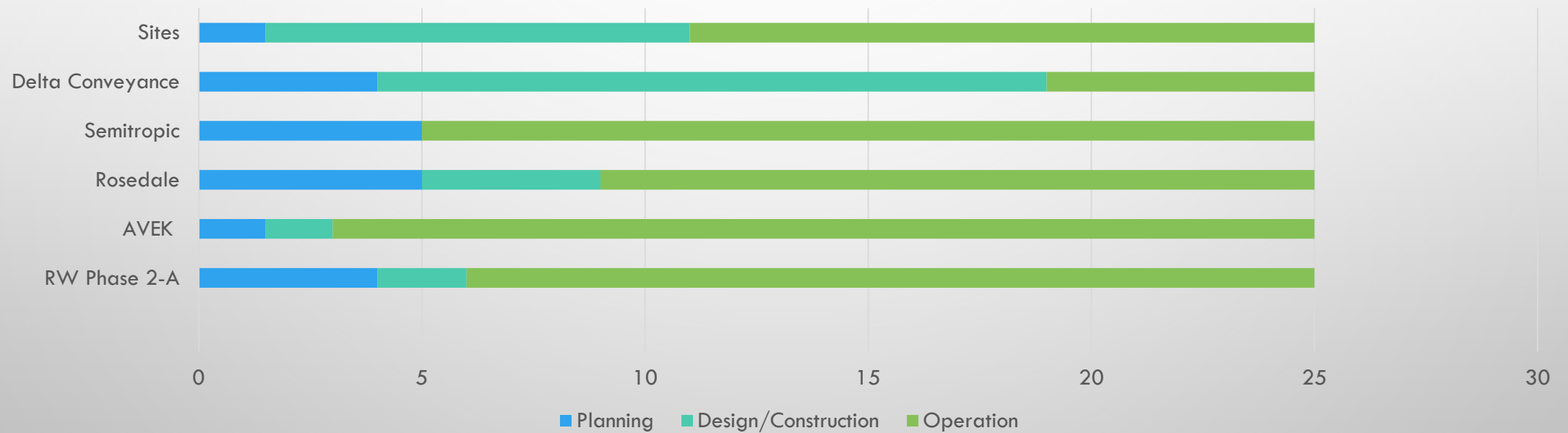
RELATIVE COSTS

(LISTED HIGHER TO LOWER RISK)

Project	Relative Unit Costs for Dry and Critically Dry Years (\$/AF)	Notes
Sites	1,280	Based on Value Planning Doc
Delta Conveyance	N/A	SWP dependability not yield drives need for project
NLF Semitropic	563	Alternative Stored Water Recovery Unit \$580/AF
Rosedale Bank	500	Rough cost estimate
AVEK Bank	550	Based on feasibility level planning Sponsor ready to proceed with negotiations for Phase 2
Saugus	790	Assumes dry and critically dry year operation only Potential that GSP may require an ASR approach
Recycled Water	3,800	Delta Stewardship Council's Reduced Reliance may drive this investment

DECISIONS WINDOW FOR SOME PROJECTS IS IN THE NEAR TERM

Comparative Project Schedules

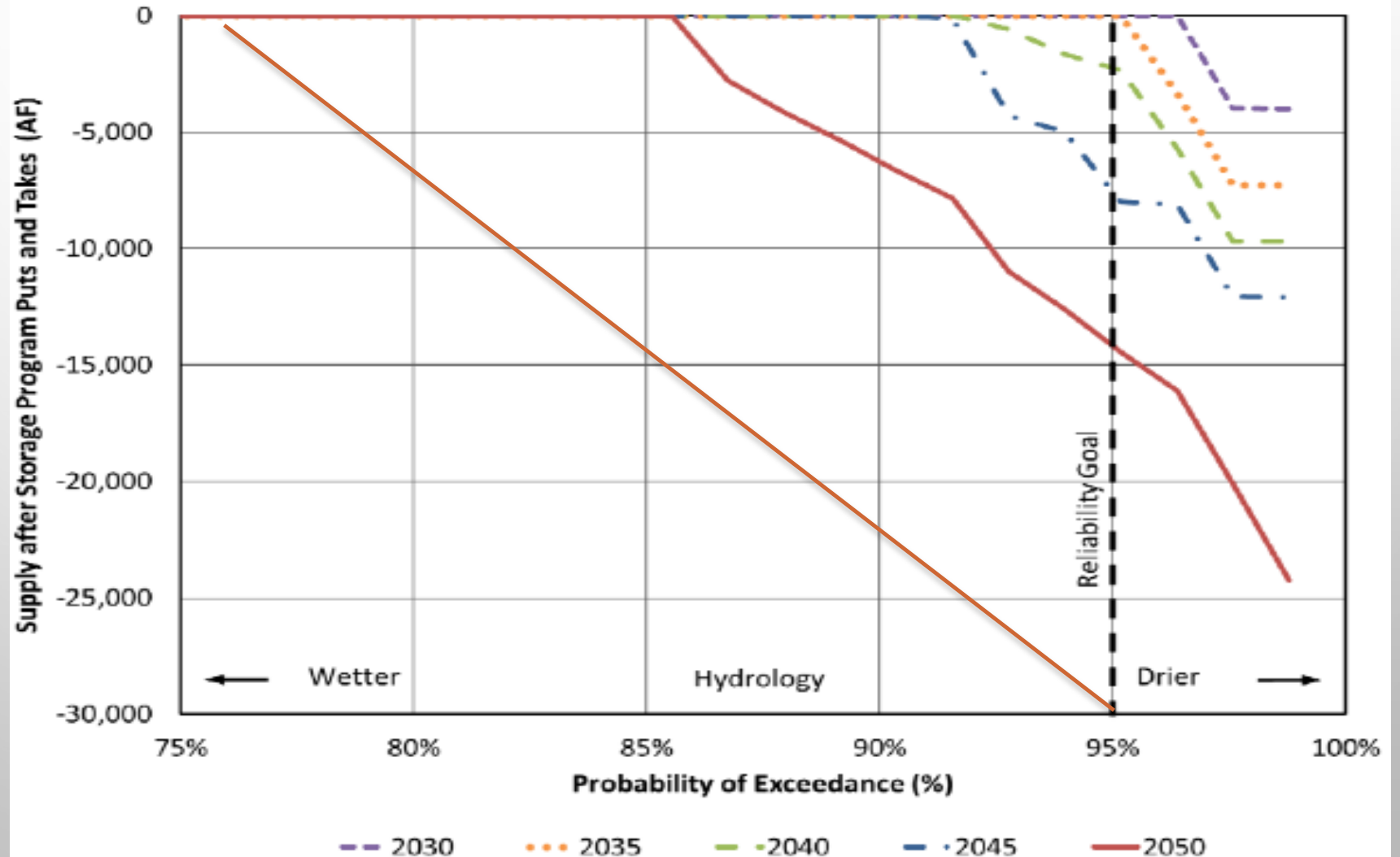


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FIGURE 3-9
SCENARIO C INITIAL RELIABILITY: DETAIL OF SUPPLY SHORTFALL



MOVING FORWARD

- **UNCERTAINTIES ABOUND**
 - REVISED DEMANDS AND SUPPLIES PENDING 2020 UWMP AND GSP
- **FOR NOW, BASE POSITION AGENCY TO MEET SCENARIO C SUPPLEMENTAL SUPPLIES (15,000 AF)**
 - SAUGUS 5 AND 6 – STAY THE COURSE – 5,500 AF
 - INITIATE PLANNING AVEK OR ROSEDALE BANKS 10,000 AF
 - RECYCLED WATER FOR REDUCED RELIANCE ON IMPORTED SUPPLIES
 - MAINTAIN SITES AS AN OPTION AT 5,000 AF
- **CONSIDER ADDITIONAL INVESTMENTS TO COVER CEC AND LONGER-TERM CLIMATE CHANGE OF 10,000 TO 15,000 AF OF ADDITIONAL DRY-SUPPLIES**
 - ADDITIONAL AVEK OR ROSEDALE BANKS (10 TAF)
 - SITES RESERVOIR (5-10 TAF)