



Turlock Subbasin GSP

Projects & Management Actions | Implementation Support Activities

JOINT GSA TECHNICAL ADVISORY COMMITTEE
OCTOBER 28, 2021

SUSTAINABLE YIELD

“The maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.”
(CWC §10721(w))



DECLINING
GROUNDWATER
LEVELS



REDUCTION OF
GROUNDWATER
STORAGE



SEAWATER
INTRUSION



WATER
QUALITY
DEGRADATION

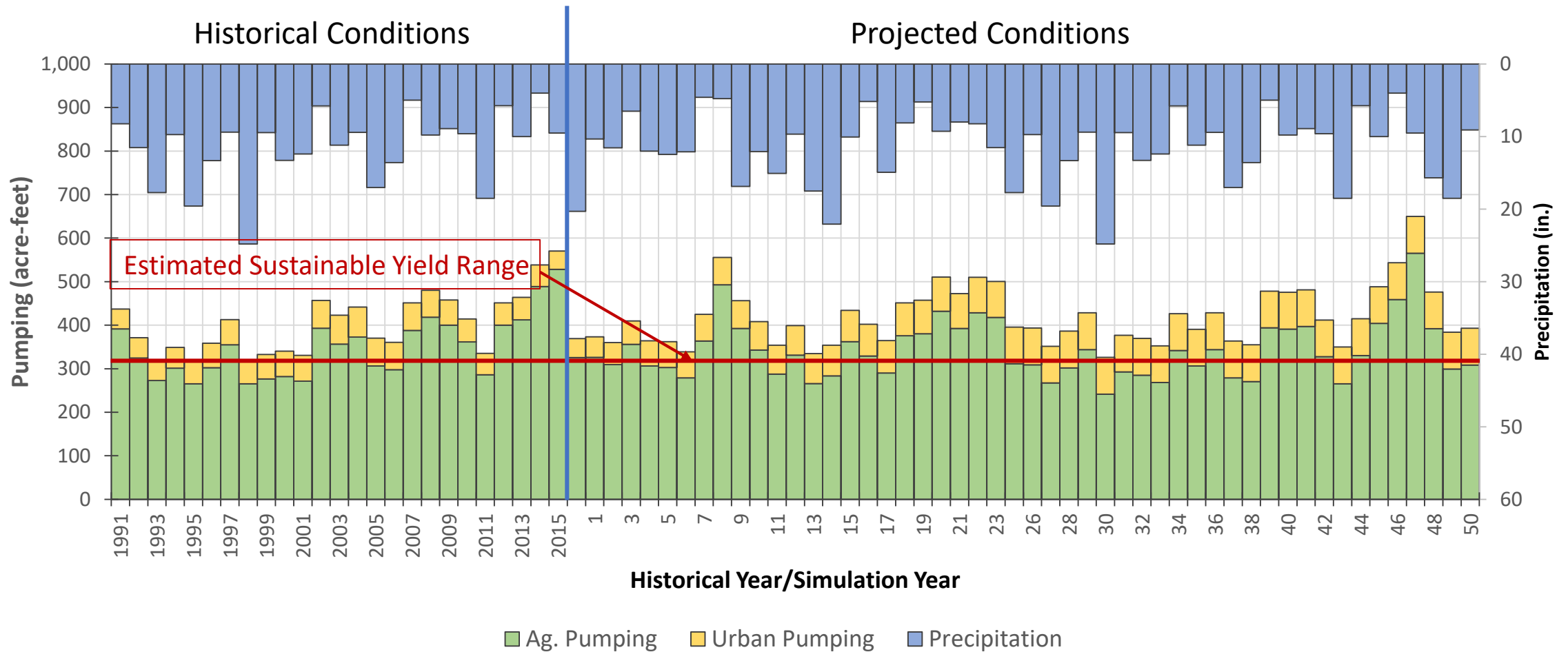


LAND
SUBSIDENCE



SURFACE
WATER
DEPLETIONS

GROUNDWATER PUMPING AND SUSTAINABLE YIELD



PMAs DEFINITIONS

- **Projects:**

Physically constructed
(structural) features

- **Management Actions:**

Non-structural programs or policies
designed to implement programs or
incentivize actions that result in
improvements in sustainability

Together, meant to:

- Make progress toward meeting sustainability goals & MOs
- Avoid violating of MTs and causing undesirable results

PROJECTS

Groups 1 & 2

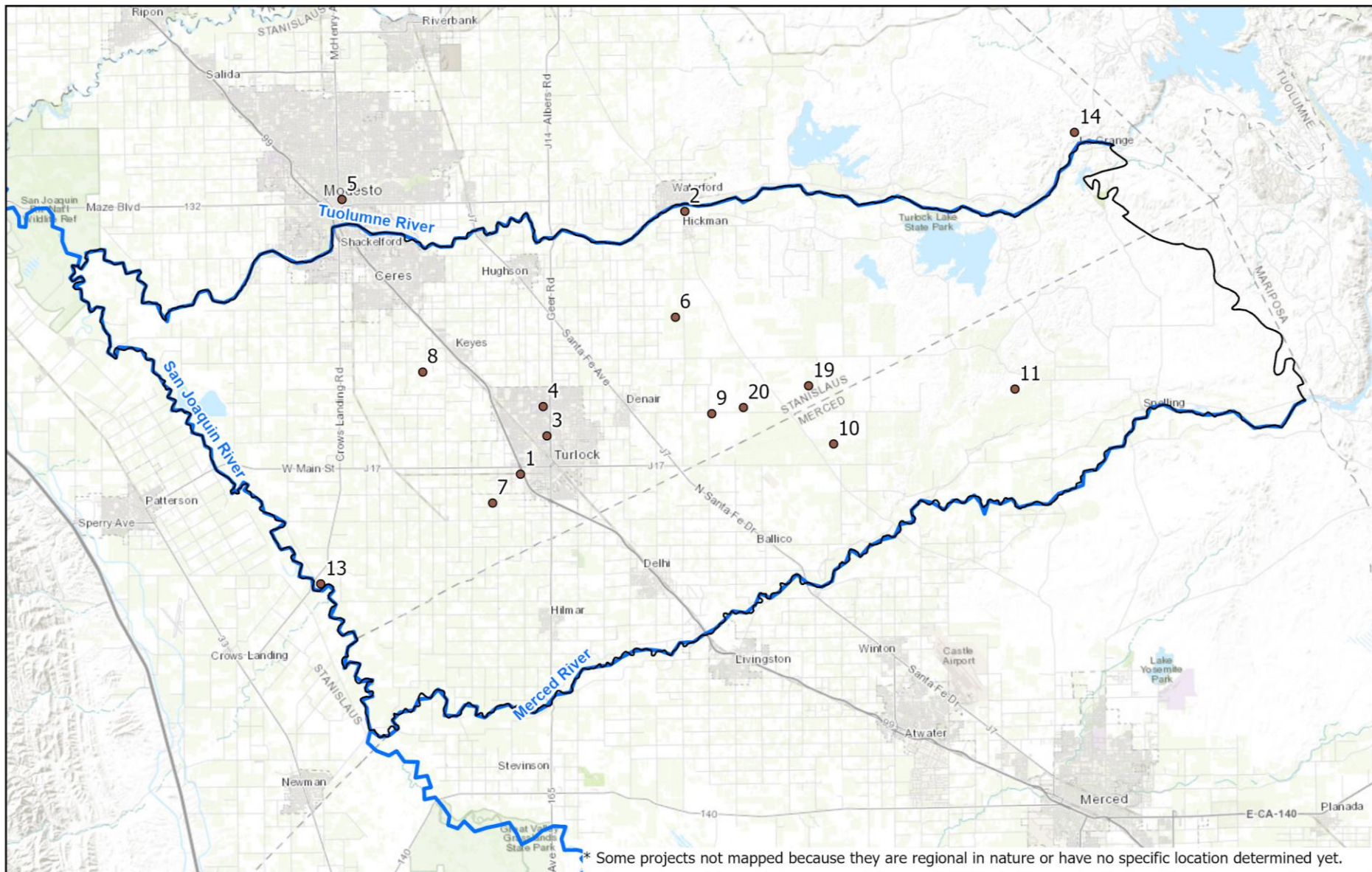
- Project in place and will continue OR currently planned and will be implemented;
- Details known; Benefits predictable
- Described and evaluated in greater detail

#	Project Name
1	Regional Surface Water Supply Project
2	Waterford/Hickman Surface Water Pump Station and Storage Tank
3	Dianne Storm Basin
4	Stanislaus State Stormwater Recharge
5	Advanced Metering Infrastructure Project (AMI)
6	TID On-Farm Recharge Project (in WTSGSA)
7	Recycled Water from City of Turlock
8	TID Ceres Main Regulating Reservoir
9	Agricultural Recharge Project (in ETSGSA)
10	Mustang Creek Flood Control Recharge Project
11	Upland/Waterford Pipeline

Group 3


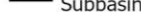

- Project identified which may occur
- Will provide benefit but not quantified
- Not evaluated in detail; described at general level

#	Project Name
1	San Joaquin River Flood Diversions
2	La Grange Recharge Project (Within TID Irrigation Service Area)
3	TID Lateral 5.5 Regulating Reservoir
4	Additional TID Regulating Reservoirs
5	Recharge from TID Conveyance System
6	Intertie Projects
7	Rouse Lake Pipeline and Recharge Project
8	Sand Creek Basin Runoff Recharge Project
9	La Grange Recharge Project
10	Merced ID Expansion Project
11	Development of Use of Diffused Water Through Existing and New Connections for Direct Recharge, FloodMAR, and In-Lieu Recharge
12	Dry Creek Development of Recharge Opportunities



Projects by Number

Legend

-  Streams
-  Turlock Subbasin
-  Projects*

- # Name
- 1 Regional Surface Water Supply Project
 - 2 Waterford/Hickman Surface Water Pump Station and Storage Tank
 - 3 Dianne Storm Basin
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 - 5 Advanced Metering Infrastructure Project (AMI)
 - 6 TID On-Farm Recharge Project (in WTSGSA)
 - 7 Recycled Water from City of Turlock
 - 8 TID Ceres Main Regulating Reservoir
 - 9 Agricultural Recharge Project (in ETSGSA)
 - 10 Mustang Creek Flood Control Recharge Project
 - 11 Upland/Waterford Pipeline
 - 12 Demand Management

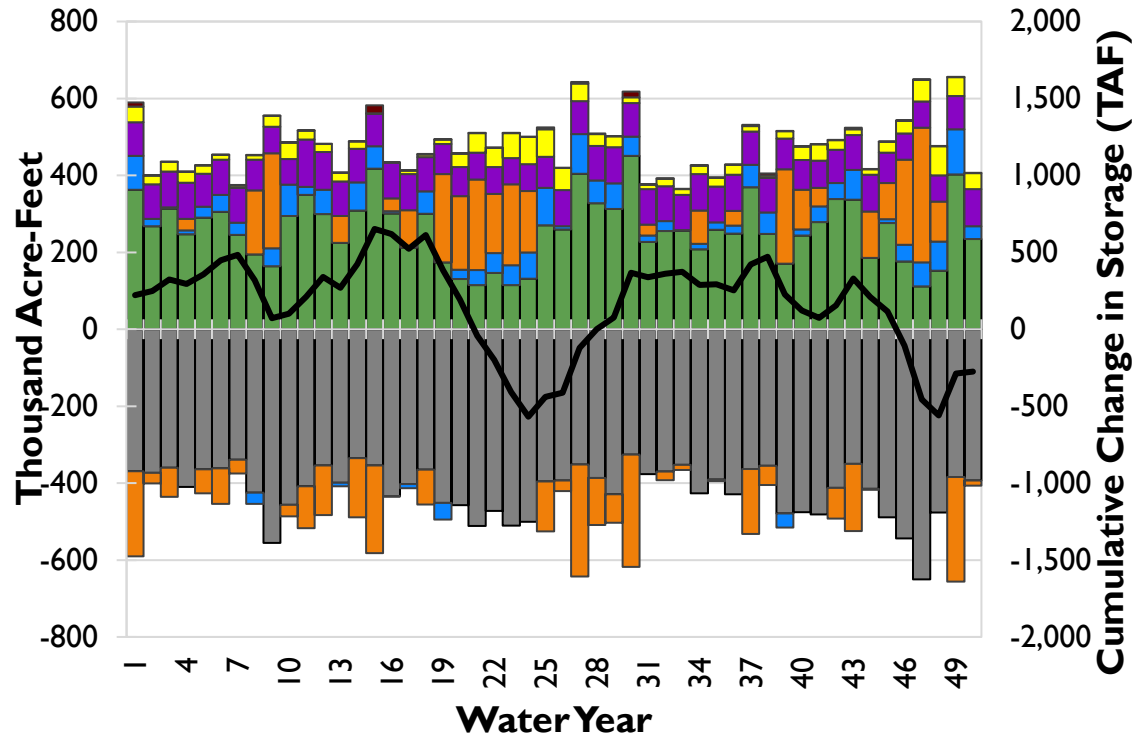
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- 13 San Joaquin River Flood Diversions
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 - 16 Additional TID Regulating Reservoirs
 - 17 Recharge from TID Conveyance System
 - 18 Intertie Projects
 - 19 Rouse Lake Pipeline Recharge Project
 - 20 Sand Creek Basin Runoff Recharge Project
 - 21 La Grange Recharge Project
 - 22 Merced ID Expansion Project
 - 23 Development of Use of Diffused Water Through Existing and New Connections for Direct Recharge, FloodMAR, and In-Lieu Recharge
 - 24 Dry Creek Development of Recharge Opportunities



October 2021

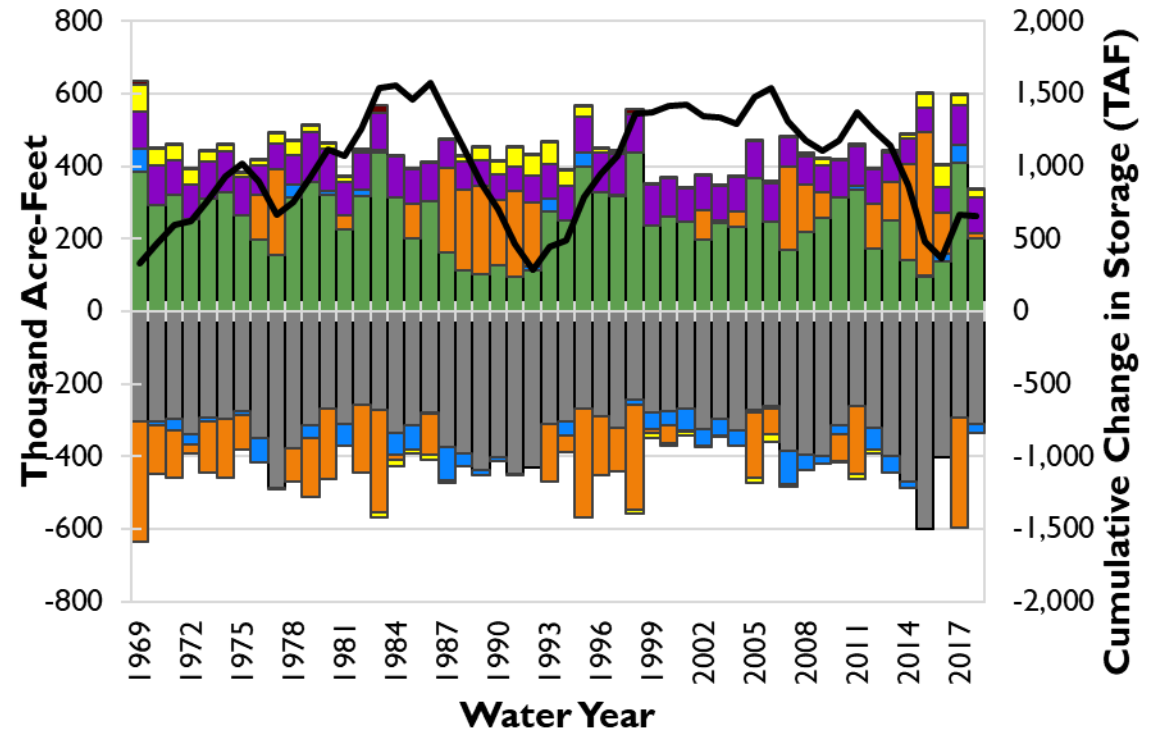
GROUNDWATER BUDGET

Baseline



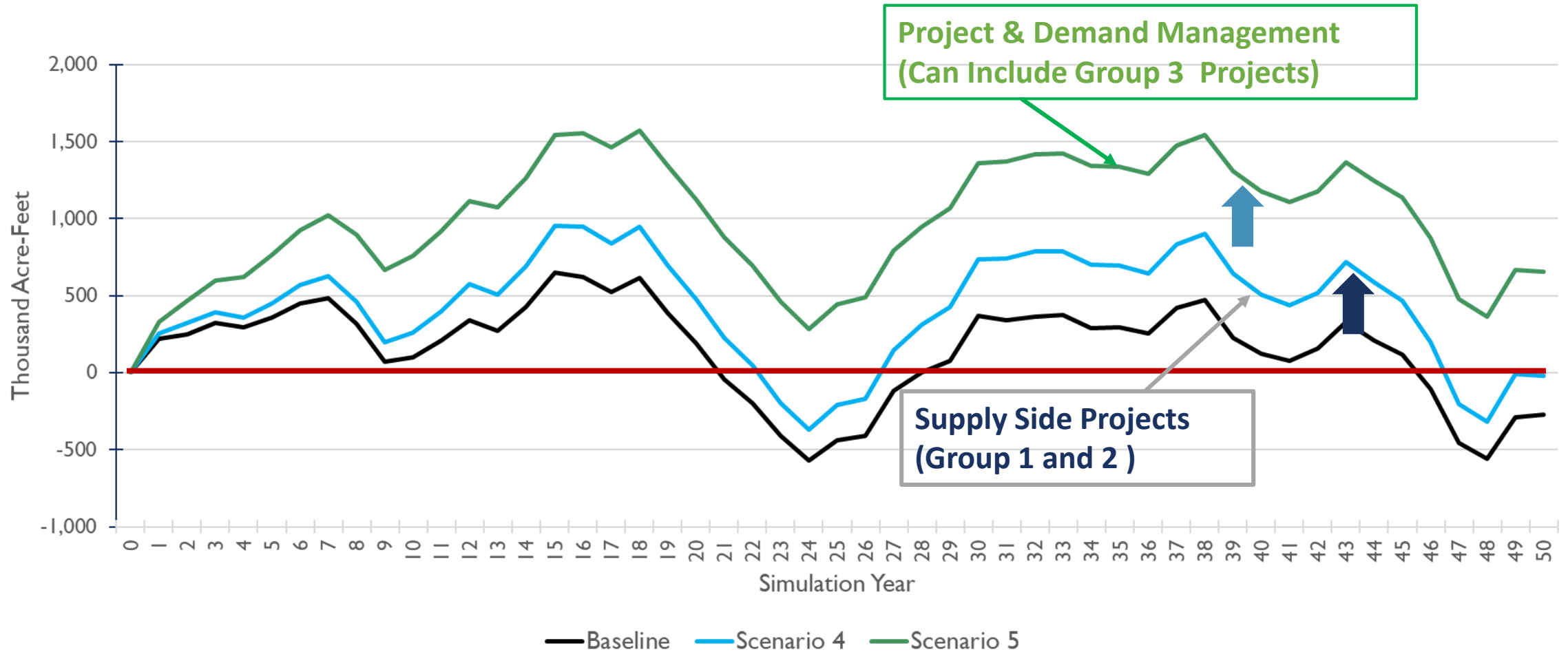
- Groundwater Pumping
- Deep Percolation
- Stream/Aquifer Interaction
- Change in GW Storage
- Canal and Reservoir Recharge
- Subsurface Flow from Adjacent Areas
- Inflow from Foothills
- Cumulative Change in Storage

Scenario 5- Sustainable Scenario



- Groundwater Pumping
- Deep Percolation
- Stream/Aquifer Interaction
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IMPROVEMENTS IN GROUNDWATER STORAGE



ADAPTIVE MANAGEMENT

- Implement Initial Projects in Group 1 and 2
- Implement Monitoring Program; Collect more data and information
- Recognize uncertainties; Update understanding
- Perform analysis to re-evaluate performance and benefits of projects
- Assess Group 3 Projects and initiate planning and implementation
- Implement Management Actions as needed: Re-assess nature, extent and timing of demand reduction
- Prepare Annual State of the Basin Reports and Five-Year GSP Updates

MANAGEMENT ACTIONS

Category	Number	Management Action
Demand Reduction Strategies	1	Voluntary Conservation and/or Land Fallowing
	2	Conservation Practices
Pumping Management Framework	3	Groundwater Extraction Reporting Program
	4	Groundwater Allocation and Pumping Management Program
	5	Groundwater Extraction Fee
	6	Groundwater Pumping Credit Market and Trading Program
Domestic Well Mitigation	7	Domestic Well Mitigation Program

PUMPING MANAGEMENT FRAMEWORK

- Four Management Actions implemented in an adaptive manner; not all may be needed or implemented by each GSA

Groundwater Extraction Reporting Program

Groundwater Extraction
Fee Program

Groundwater Allocation and Pumping Management Program

Groundwater Pumping
Credit Market and
Trading Program

DOMESTIC WELL MITIGATION PROGRAM

Anticipated steps:

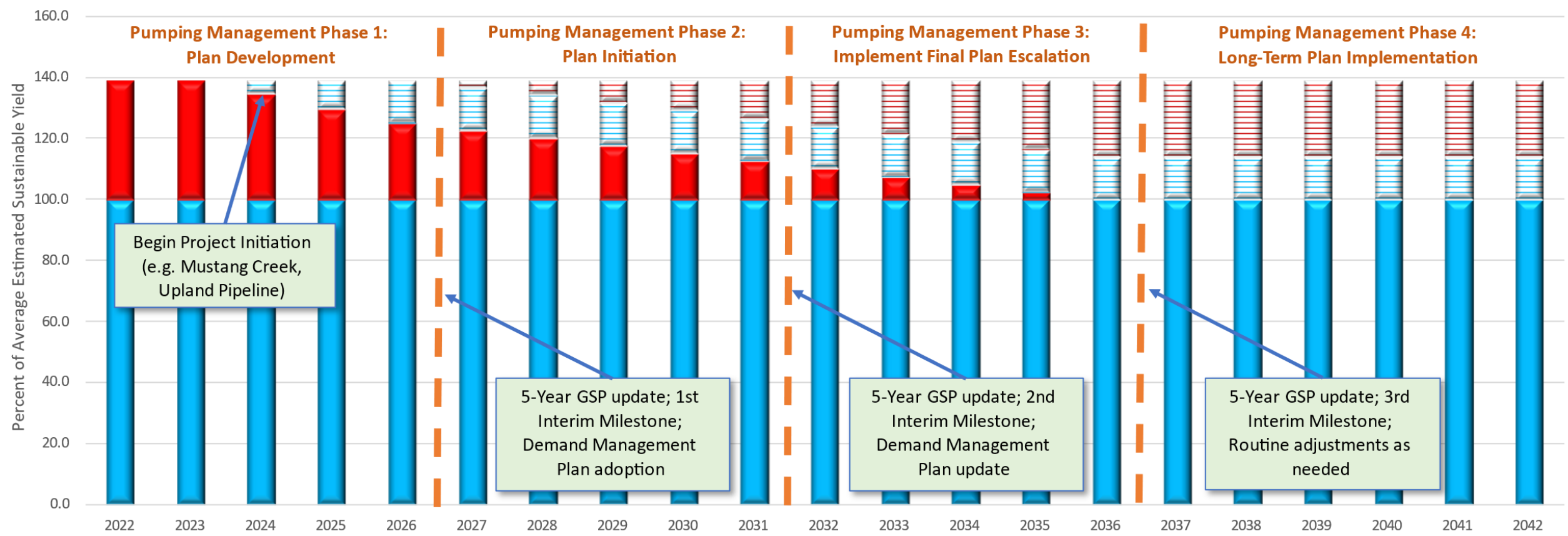
- Coordinate with existing programs
- Assess the need for a Well Registration Program for domestic wells
- Share information between local drinking water programs and well drillers on anticipated water levels
- Monitor areas of domestic well information gaps
- Target GSP projects in areas of potentially vulnerable wells
- Develop a 3-tiered Corrective Action Plan for potential domestic well mitigation

MORE ON ADAPTIVE MANAGEMENT

- Uncertainty will always be present; use monitoring of groundwater conditions to determine additional actions needed; combination of:
 - Group 3 Projects
 - Pumping Management Framework
 - Demand Reduction Strategies
- Adaptive Management Strategy Concepts on Next Slides

ADAPTIVE MANAGEMENT W/GROUP 1&2 PROJECTS

Adaptive Management with Implementation of Group 1 and 2 Projects

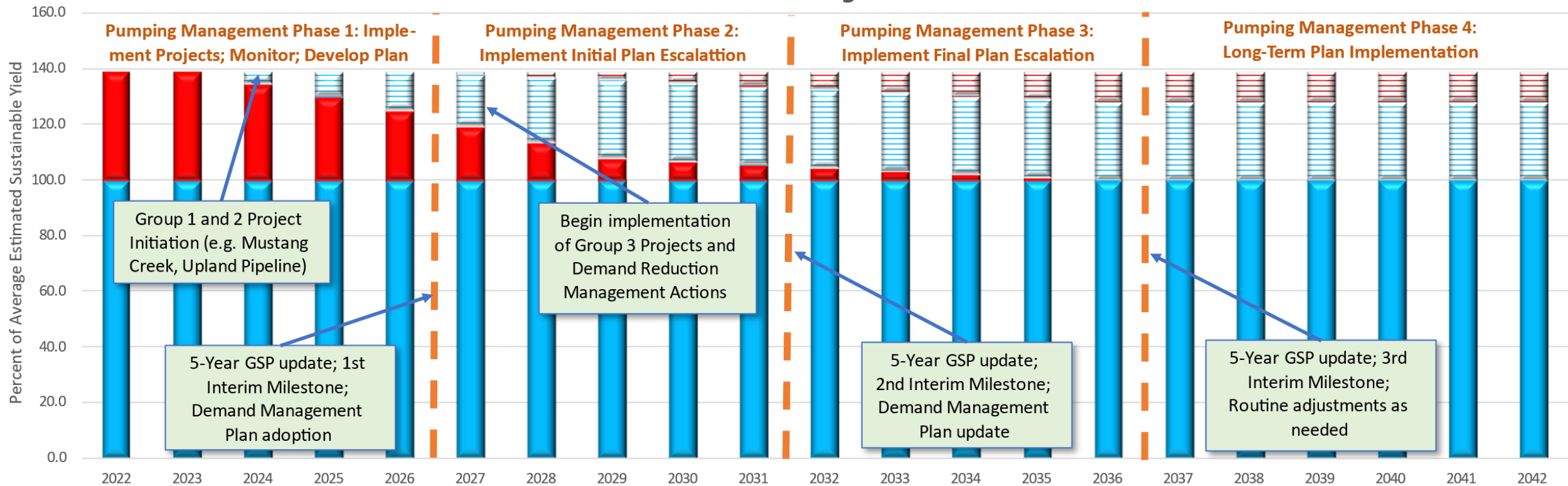


PRELIMINARY DRAFT; SUBJECT TO REVISION

■ Sustainable Pumping
 ■ Unsustainable Pumping
 ■ Project Yield
 ■ Demand Reduction

ADAPTIVE MANAGEMENT w/GROUP 1, 2, & 3 PROJECTS

Adaptive Management with Implementation of Group 1, 2 and 3 Projects and Demand Reduction Management Actions

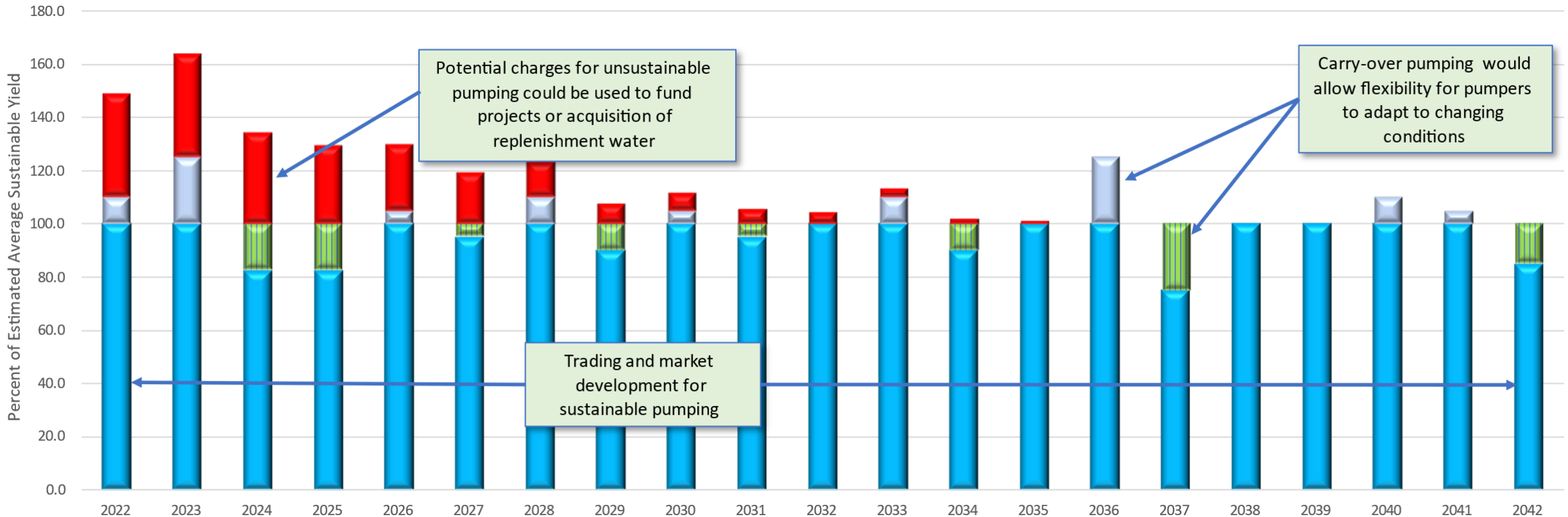


PRELIMINARY DRAFT; SUBJECT TO REVISION

■ Sustainable Pumping
 ■ Unsustainable Pumping
 ▨ Project Yield
 ▨ Demand Reduction

ADAPTIVE MANAGEMENT w/CARRY-OVER PUMPING, ALLOCATION TRADING, MARKETS AND FEES

Carry-Over Pumping; Allocation Trading, Markets and Fees



IMPLEMENTATION SUPPORT ACTIVITIES (ISA)

- Activities and actions in support of implementing GSP between 2022-2042, focusing on first 5 years

#	Implementation Support Activity
1	Monitoring, Reporting, and Outreach
2	Addressing Identified Data Gaps Including Updating and Improving the Existing Monitoring Network
3	Accounting Mechanism for Water Supplies within the Subbasin
4	Implement Project and Management Actions including an Adaptive Management Approach
5	Develop Action Plan for Exceedance of Minimum Thresholds Which May Result in Undesirable Results
6	Refine Groundwater Model Incorporating New Data and Studies
7	Further Develop Data Management System
8	Improve Coordination and Planning Integration
9	Well Registration and Management
10	Develop Financing Strategies, Including Seeking Grant Funding