Meeting objective

- Get stakeholder input on water supply projects and strategies
  - Are we including the right mix of projects?
  - Are there factors that we haven’t considered?
  - Are there additional strategies we should be considering?
Multiple topics for discussion

Water Supply Master Plan background

Water supply reliability outlook

Project evaluation

Water supply strategies

Next steps
Multiple topics for discussion

- Water Supply Master Plan background
- Water supply reliability outlook
- Project evaluation
- Water supply strategies
- Next steps
Relationship with other plans

**One Water** integrates State, regional and local policies into a countywide framework for managing water resources on a watershed scale. The framework includes goals and objectives for flood protection, stream stewardship, and water supply functions of the District.

**Master plans** prioritize strategies for achieving Board policies and the goals and objectives in the One Water framework. They provide level of service goals and inform program-level plans.

**Program-level plans (examples)** describe how the level of service goals in the master plans will be achieved.

**Programs and projects** implement the master plans and program-level plans.

**Financial plans** implement the master plans and program-level plans through projects and programs.
Water Supply Master Plan Purpose

- Establish level of service goal
  - E.g., meet 85% of demands in drought years
- Comprehensive evaluation of project and program costs, benefits, and risks
- Recommended investment strategy
  - Which projects when and at what cost
2012 Master Plan “Ensure Sustainability” Strategy

Level of service goal – Meet 90% of demands in droughts

- Secure existing system
  - Dam retrofits, asset management, pipeline repair, maintain imports

- Optimize existing system
  - New recharge, new pipelines

- Expand conservation and reuse
  - Graywater, potable reuse
Multiple topics for discussion

- Water Supply Master Plan background
- Water supply reliability outlook
- Project evaluation
- Water supply strategies
- Next steps
Assume existing system and operations continue with a few changes

- **Dam retrofits completed** by 2025
- **FAHCE Settlement Agreement** reservoir releases and flow requirements implemented early in the planning time frame
- **Delta-conveyed imported water** supplies decrease by about 40,000 AFY by 2035
- Retailer non-potable **recycled water use increases** by 10,000 AFY by 2040
- **Water conservation program savings increase** by 25,000 AFY by 2030
- **Countywide demands increase** by about 40,000 AFY by 2040, after accounting for conservation savings
Population increasing more quickly than demands

Historic Water Use
Projected Demand
Historic Population
Projected Population
Delta-conveyed deliveries expected to continue to decline
Analysis shows declining reliability

**Average Water Supply Conditions**

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2040</th>
</tr>
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<tbody>
<tr>
<td>Demands (AF)</td>
<td>360,000</td>
<td>402,000</td>
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<tr>
<td>Average Annual Supply (AF)</td>
<td>374,000</td>
<td>366,000</td>
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<td>Shortfall (AF)</td>
<td>0</td>
<td>36,000</td>
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**Drought Water Supply Conditions**

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2040</th>
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</thead>
<tbody>
<tr>
<td>Demands (AF)</td>
<td>360,000</td>
<td>402,000</td>
</tr>
<tr>
<td>Minimum Drought Supply (AF)</td>
<td>255,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Maximum Shortfall (AF)</td>
<td>105,000 (29%)</td>
<td>152,000 (38%)</td>
</tr>
</tbody>
</table>
Multiple topics for discussion

- Water Supply Master Plan background
- Water supply reliability outlook
- Project evaluation
- Water supply strategies
- Next steps
Evaluated about 40 projects for filling gaps

- Conservation and demand management
- Stormwater capture and reuse
- Onsite reuse
- Potable reuse
- Recycled water
- Groundwater recharge ponds

- Raw water pipelines
- Ag land fallowing
- Storage, inside and outside county
- Desalination
- Dry year options/transfers
- Water contract purchase
- California WaterFix
“No Regrets” package is cost-effective and broadly supported

- Advanced Metering Infrastructure
- Gray Water Program Expansion
- Leak Repair Incentive
- New Development Model Ordinance
- Stormwater Capture and Reuse
  - Ag Land Recharge
  - Rain Barrel Rebate
  - Rain Garden Rebate
  - San Jose Recharge
  - Saratoga Recharge

<table>
<thead>
<tr>
<th></th>
<th>Total District Cost</th>
<th>Additional Water Conservation Savings</th>
<th>Additional Water Supply Yield</th>
<th>Unit Cost</th>
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<tbody>
<tr>
<td></td>
<td>$100 million</td>
<td>10,000 AF</td>
<td>1,000 AF</td>
<td>$400/AF</td>
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</table>
Several projects analyzed in detail

<table>
<thead>
<tr>
<th>Project</th>
<th>Average Annual Yield (AF)</th>
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<tbody>
<tr>
<td>California WaterFix</td>
<td>41,000</td>
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<tr>
<td>Dry Year Options/Transfers</td>
<td>2,000</td>
</tr>
<tr>
<td>Groundwater Banking</td>
<td>2,000</td>
</tr>
<tr>
<td>Groundwater Recharge</td>
<td>1,000 – 2,000</td>
</tr>
<tr>
<td>Lexington Pipeline</td>
<td>3,000</td>
</tr>
<tr>
<td>Los Vaqueros</td>
<td>3,000</td>
</tr>
<tr>
<td>Pacheco Reservoir</td>
<td>6,000</td>
</tr>
<tr>
<td>Potable Reuse - Ford Pond</td>
<td>3,000</td>
</tr>
<tr>
<td>Potable Reuse – Injection Wells</td>
<td>12,000</td>
</tr>
<tr>
<td>Potable Reuse - Los Gatos Ponds</td>
<td>19,000</td>
</tr>
<tr>
<td>Sites Reservoir</td>
<td>8,000</td>
</tr>
<tr>
<td>Water Contract Purchase</td>
<td>12,000</td>
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</table>
## Project costs vary

<table>
<thead>
<tr>
<th>Project</th>
<th>Average Annual Yield (AFY)</th>
<th>District Lifecycle Cost (present value, 2017)</th>
<th>Unit Cost</th>
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<tbody>
<tr>
<td>California WaterFix</td>
<td>41,000</td>
<td>$620 million</td>
<td>$600/AF</td>
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<td>Dry Year Options/Transfers</td>
<td>2,000</td>
<td>$100 million</td>
<td>$1,400/AF</td>
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<td>Groundwater Banking</td>
<td>2,000</td>
<td>$60 million</td>
<td>$1,300/AF</td>
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<td>Groundwater Recharge</td>
<td>1,000 – 2,000</td>
<td>$20 million - $50 million</td>
<td>$400/AF - $1,300/AF</td>
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<td>3,000</td>
<td>$90 million</td>
<td>$1,000/AF</td>
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<td>Los Vaqueros¹</td>
<td>3,000</td>
<td>$40 million</td>
<td>$400/AF</td>
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<td>Pacheco Reservoir¹</td>
<td>6,000</td>
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<td>$2,700/AF</td>
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<td>$1.18 billion</td>
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<td>Sites Reservoir¹</td>
<td>8,000</td>
<td>$170 million</td>
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<td>Water Contract Purchase</td>
<td>12,000</td>
<td>$360 million</td>
<td>$800/AF</td>
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1. Assumes Prop 1 Water Storage Investment Program funding. Costs would roughly double without funding.
Different projects meet different objectives

<table>
<thead>
<tr>
<th>Project</th>
<th>Secure Existing Supplies</th>
<th>Reduce Reliance on Delta</th>
<th>Water Use Efficiency</th>
<th>Groundwater Quality</th>
<th>Treated Water Quality</th>
<th>Minimize Costs</th>
<th>District Control</th>
<th>Minimize Implementation Complexity</th>
<th>Allows for Phasing</th>
<th>Adapts to Climate Change</th>
<th>Provide ecosystem benefits</th>
<th>Reduce GHG Emissions</th>
<th>Environmental Justice</th>
<th>Recreation</th>
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<td>Groundwater Banking</td>
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</tbody>
</table>
Different projects have different risk levels.
Different projects have different types of risk
Multiple topics for discussion

Water Supply Master Plan background

Water supply reliability outlook

Project evaluation

Water supply strategies

Next steps
Recent Board actions

- **9/19/17** – Approved “No Regrets” Package of water conservation and stormwater capture projects
- **10/17/17** – Conditionally approved California WaterFix participation
- **12/12/17** – Approved Los Gatos Potable Reuse Project
Board approved projects achieve reliability goal

<table>
<thead>
<tr>
<th>Variants</th>
<th>Demands</th>
<th>Average Supplies</th>
<th>Minimum Drought Supply</th>
<th>Maximum Drought Shortage</th>
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</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>402,000</td>
<td>366,000</td>
<td>250,000</td>
<td>152,000 (38%)</td>
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<tr>
<td>No Regrets</td>
<td>392,000</td>
<td>366,000</td>
<td>250,000</td>
<td>142,000 (36%)</td>
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<td>No Regrets &amp; Morgan Hill Recharge &amp; California WaterFix</td>
<td>392,000</td>
<td>393,000</td>
<td>291,000</td>
<td>101,000 (26%)</td>
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<td>No Regrets &amp; Morgan Hill Recharge &amp; California WaterFix &amp; Potable Reuse-Los Gatos Ponds</td>
<td>392,000</td>
<td>400,000</td>
<td>336,000</td>
<td>56,000 (14%)</td>
</tr>
</tbody>
</table>
Alternative Water Supply Strategies

Local Flexibility
All Potable Reuse, Lexington Pipeline, Saratoga Recharge

Local Storage
California WaterFix, Pacheco Reservoir, Groundwater Banking

Regional Storage
California WaterFix, Los Vaqueros Reservoir, Groundwater Banking

Statewide Storage
California WaterFix, Sites Reservoir
### Alternative Water Supply Strategies

Board approved projects have unit cost of $1,800/AF

<table>
<thead>
<tr>
<th>Strategy*</th>
<th>Unit Cost</th>
<th>Average Supplies (AFY)</th>
<th>Minimum Drought Supply (AFY)</th>
<th>Maximum Drought Shortage (AFY)</th>
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<tbody>
<tr>
<td>Local Flexibility</td>
<td>$3,600/AF</td>
<td>395,000</td>
<td>334,000</td>
<td>54,000 (15%)</td>
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<tr>
<td>Local Storage**</td>
<td>$1,200/AF</td>
<td>400,000</td>
<td>336,000</td>
<td>56,000 (14%)</td>
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<tr>
<td>Regional Storage**</td>
<td>$900/AF</td>
<td>394,000</td>
<td>336,000</td>
<td>56,000 (14%)</td>
</tr>
<tr>
<td>Statewide Storage**</td>
<td>$900/AF</td>
<td>398,000</td>
<td>336,000</td>
<td>56,000 (14%)</td>
</tr>
</tbody>
</table>

*All strategies have annual demands of 392,000 AF and include No Regrets and Morgan Hill Recharge

**Assumes Prop 1 funding
Different strategies achieve different objectives

<table>
<thead>
<tr>
<th>Local Flexibility</th>
<th>Local Storage</th>
<th>Regional Storage</th>
<th>Statewide Storage</th>
</tr>
</thead>
</table>
| • Secure existing supplies  
  • Reduce reliance on Delta  
  • Protect groundwater quality  
  • Maximize District influence  
  • Allow for phased implementation  
  • Adapt to climate change | • Secure existing supplies  
  • Meet drinking water regulations  
  • Maximize District influence  
  • Adapt to climate change  
  • Provide ecosystem benefits  
  • Provide flood protection | • Secure existing supplies  
  • Meet drinking water regulations  
  • Minimize costs  
  • Allow for phased implementation  
  • Adapt to climate change  
  • Provide ecosystem benefits | • Secure existing supplies  
  • Minimize costs  
  • Adapt to climate change  
  • Provide ecosystem benefits |
Different strategies have different risks

*Assumes Prop 1 funding
Uncertainty Analysis Approach

- High Demands, Low Imports
- High Demands, High Imports
- Lower Demands, Low Imports
- Lower Demands, High Imports
Uncertainty Analysis Results

- All strategies perform well under a variety of supply and demand scenarios.
- Water shortage contingency plan implementation important.
- Banking capacity valuable, up to a certain capacity.
- Potable Reuse needs optimization.
Local supplies seem fairly secure

Reduction in imported supplies is greater than local supplies due to sea level rise

Variability a challenge
Multiple topics for discussion

Water Supply Master Plan background

Water supply reliability outlook

Project evaluation

Water supply strategies

Next steps
Level of Service Goal Considerations

- Balance costs and level of service
- Avoid triggering mandatory restrictions by retailers
- Stakeholder support
- Short-term responses (e.g., transfers) can help fill gaps
- Most strategies cost more than associated cost of shortage
Multiple decision points, including:

- Prop 1 storage funding – June 2018 or sooner
- California WaterFix permits – Winter 2018
- Select P3 entity for potable reuse - 2019
- Annual supply and demand review – Summer
- Annual CIP, budget, and water charge process begins - Fall
Example implementation process

Existing Board-approved projects

California WaterFix permitted at 6,000 cfs

Change Strategy?

Yes

Increase potable reuse capacity?

No

Board maintains existing strategy

No

Evaluate other project alternatives

Monitor supplies and demands
Next steps for Water Supply Master Plan

- **September 2017**: Board input on water supply projects and strategies
- **January 2018**: External engagement on water supply projects and strategies
- **March 2018**: Proposed Water Supply Master Plan implementation approach, including triggers for adding or removing projects