Appendix E. Summary of the Comprehensive List of Water Supply Options Considered in the Water Supply Evaluation

<table>
<thead>
<tr>
<th>Water Supply Option or Strategy</th>
<th>Availability(^{11})</th>
<th>Dry Year Yield(^{11})</th>
<th>Average Annual Yield(^{11})</th>
<th>Peak Day Capacity, mgd(^{11})</th>
<th>Estimated Timing: Supply is Available to Zone 7(^{11})</th>
<th>Total Costs (does not reflect funding source)</th>
<th>Included in Portfolio Analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>af mgd af mgd</td>
<td>af mgd af mgd</td>
<td>af mgd af mgd</td>
<td>af mgd af mgd</td>
<td>2020 - 2030</td>
<td>Capital Cost, $(f)</td>
<td>$/year(g)</td>
</tr>
<tr>
<td>Increased Yield from Existing Supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta Fix (\text{(increase long-term average yield of existing State Water Project contract from 60% to 75%)})</td>
<td>Depends on hydrologic conditions</td>
<td>no change</td>
<td>no change</td>
<td>12,100</td>
<td>10.8</td>
<td>12,100</td>
<td>10.8</td>
</tr>
<tr>
<td>Modified Operation of Lake Del Valle</td>
<td>Depends on hydrologic conditions</td>
<td>no change</td>
<td>no change</td>
<td>600</td>
<td>0.9</td>
<td>600</td>
<td>0.9</td>
</tr>
<tr>
<td>Confirm BBID Contract</td>
<td>Available during all hydrologic conditions</td>
<td>3,000</td>
<td>2.7</td>
<td>3,000</td>
<td>2.7</td>
<td>3,000</td>
<td>2.7</td>
</tr>
<tr>
<td>New or Additional Water Supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Additional Water from the State Water Project (\text{(increase contract above 80,619 af)})</td>
<td>Depends on hydrologic conditions</td>
<td>10% to 30% of Contract Amount</td>
<td>10% to 30% of Contract Amount</td>
<td>60% of Contract Amount</td>
<td>60% of Contract Amount</td>
<td>10% to 30% of Contract Amount</td>
<td>60% of Contract Amount</td>
</tr>
<tr>
<td>Long-term Non-State Water Project Lease or Transfer (\text{(not spot market water)})</td>
<td>Depends on hydrologic conditions</td>
<td>14,000</td>
<td>12.5</td>
<td>10,900</td>
<td>9.7</td>
<td>0</td>
<td>10,900</td>
</tr>
</tbody>
</table>
Appendix E. Summary of the Comprehensive List of Water Supply Options Considered in the Water Supply Evaluation

<table>
<thead>
<tr>
<th>Water Supply Option or Strategy</th>
<th>Availability(^{(d)})</th>
<th>Dry Year Yield(^{(d)})</th>
<th>Average Annual Yield(^{(d)})</th>
<th>Peak Day Capacity, mgd(^{(d)})</th>
<th>Estimated Timing: Supply is Available to Zone 7(^{(d)})</th>
<th>Total Costs (does not reflect funding source)</th>
<th>Included in Portfolio Analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Vaqueros Reservoir Expansion</td>
<td>Depends on hydrologic conditions</td>
<td>0 to 8,300</td>
<td>7.4</td>
<td>0 to 8,300</td>
<td>7.4</td>
<td>0</td>
<td>2015 - 2020</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Transfers via Purchase of Agricultural or M&amp;I Land</td>
<td>-- -- -- -- -- -- -- --</td>
<td>-- -- -- --</td>
<td>--</td>
<td>--</td>
<td>--</td>
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</tr>
</tbody>
</table>

**Stormwater Runoff and Rainfall Capture**

<table>
<thead>
<tr>
<th>Water Supply Option or Strategy</th>
<th>Availability(^{(d)})</th>
<th>Dry Year Yield(^{(d)})</th>
<th>Average Annual Yield(^{(d)})</th>
<th>Peak Day Capacity, mgd(^{(d)})</th>
<th>Estimated Timing: Supply is Available to Zone 7(^{(d)})</th>
<th>Total Costs (does not reflect funding source)</th>
<th>Included in Portfolio Analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of Arroyo Mocho Water Rights</td>
<td>Depends on hydrologic conditions</td>
<td>&lt; 200</td>
<td>&lt; 0.18</td>
<td>900 to 1,800</td>
<td>0.8 to 1.6</td>
<td>0</td>
<td>2020 - 2030</td>
</tr>
<tr>
<td>Acquisition of Arroyo Las Positas Water Rights</td>
<td>Depends on hydrologic conditions</td>
<td>&lt; 200</td>
<td>&lt; 0.18</td>
<td>800 to 1,500</td>
<td>0.7 to 1.3</td>
<td>0</td>
<td>2020 - 2030</td>
</tr>
<tr>
<td>Acquisition of Tassajara and San Ramon Valley Creeks Water Rights</td>
<td>-- -- -- -- -- -- -- --</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>End-User Local Rain Capture for Recharge (Low Impact Development)</td>
<td>-- -- -- -- -- -- -- --</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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</tr>
</tbody>
</table>
### Appendix E. Summary of the Comprehensive List of Water Supply Options Considered in the Water Supply Evaluation

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>End-User Local Rain Capture for Irrigation (residential, commercial, institutional roof top capture)</td>
<td>Available during all hydrologic conditions (storage is less than yield during driest year on record)</td>
<td>220 to 860</td>
<td>0.2 to 0.8</td>
<td>220 to 860</td>
<td>0.2 to 0.8</td>
<td>0</td>
<td>2015 - 2040</td>
<td>$94,000,000 to $395,000,000</td>
<td>$9,400,000 to $39,500,000</td>
</tr>
</tbody>
</table>

### Recycled Water for Livermore-Amador Valley (Water Demand Reduction for Zone 7 Water Agency)

| Recycled Water - Direct and Indirect Use | Available during all hydrologic conditions | 2,600-16,000 - 2,600-16,000 depends on demand (needs additional analysis) | 2,600-16,000 - 2,600-16,000 depends on demand (needs additional analysis) | 2.3 to 14.3 | 2.3 to 14.3 | 0 to 16.3 | Builds up over time pending location of demand (needs additional analysis) | Varies according to project | Varies according to project | $1,500 to $2,400 | YES - Backup Portfolio (In-Valley Portfolio) |

| Recycled Water - Direct and Indirect Use | Available during all hydrologic conditions | 2,600-16,000 - 2,600-16,000 depends on demand (needs additional analysis) | 2,600-16,000 - 2,600-16,000 depends on demand (needs additional analysis) | 2.3 to 14.3 | 2.3 to 14.3 | 0 to 16.3 | Builds up over time pending location of demand (needs additional analysis) | Varies according to project | Varies according to project | $1,500 to $2,400 | YES - Backup Portfolio (In-Valley Portfolio) |

| End-User Graywater Reuse for Residential Irrigation | Available during all hydrologic conditions | 1,200 to 5,400 | 1.1 to 4.8 | 1,200 to 5,400 | 1.1 to 4.8 | 2.2 to 10 | Builds up over time from 2015 to buildout | $20,000,000 to $163,000,000 | $3,000,000 to $24,000,000 | $3,700 to $6,600 | Not at this time due to potential "end-user" regulatory issues (cannot count on end-user to comply) and costs. |

| Groundwater Injection with Highly Treated Recycled Water  (recharge groundwater basin with recycled water treated with reverse osmosis technology) | Available during all hydrologic conditions | Additional Supply in Main Basin: 2,800 af/yr | Additional Supply in Main Basin: 2,800 af/yr | Additional Supply in Main Basin: 2,800 af/yr | Additional Supply in Main Basin: 2,800 af/yr | 0 | 2015 - 2020 | $34,000,000 to $40,000,000 | $1,400,000 | $1,500 to $1,600 | YES - however, direct recycled water was used first due to costs. |
Appendix E. Summary of the Comprehensive List of Water Supply Options Considered in the Water Supply Evaluation

<table>
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<tr>
<th>Water Supply Option or Strategy</th>
<th>Availability</th>
<th>Dry Year Yield[^a]</th>
<th>Average Annual Yield[^b]</th>
<th>Peak Day Capacity, mgd[^c]</th>
<th>Estimated Timing: Supply is Available to Zone 7[^d]</th>
<th>Total Costs (does not reflect funding source)</th>
<th>Included in Portfolio Analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Waste Stream Reuse</td>
<td>Available during all hydrologic conditions</td>
<td>&lt; 100</td>
<td>&lt; 0.1</td>
<td>&lt; 100</td>
<td>&lt; 0.1</td>
<td>&gt; 0.2</td>
<td>--</td>
</tr>
<tr>
<td>Commercial/Industrial Waste Stream Reuse</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Acquisition of Yara Yara Well</td>
<td>Available during all hydrologic conditions</td>
<td>280</td>
<td>0.25</td>
<td>280</td>
<td>0.25</td>
<td>0.75</td>
<td>2011 - 2015</td>
</tr>
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</table>

Desalination/Demineralization

<table>
<thead>
<tr>
<th>Water Supply Option or Strategy</th>
<th>Availability</th>
<th>Dry Year Yield[^a]</th>
<th>Average Annual Yield[^b]</th>
<th>Peak Day Capacity, mgd[^c]</th>
<th>Estimated Timing: Supply is Available to Zone 7[^d]</th>
<th>Total Costs (does not reflect funding source)</th>
<th>Included in Portfolio Analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay Area Regional Desalination Project</td>
<td>Available during all hydrologic conditions</td>
<td>1,500-5,600</td>
<td>1.3-5</td>
<td>5,600 to 9,300</td>
<td>5 to 8.3</td>
<td>0</td>
<td>2015 - 2020</td>
</tr>
<tr>
<td>ACWD Entitlement Exchange via Demineralization</td>
<td>Available during all hydrologic conditions</td>
<td>4,100</td>
<td>3.7</td>
<td>4,100</td>
<td>3.7</td>
<td>0 to 3.7</td>
<td>2020 - 2025</td>
</tr>
<tr>
<td>Fringe Basin Development (including Mocha Sub basin I)</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
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## Appendix E. Summary of the Comprehensive List of Water Supply Options Considered in the Water Supply Evaluation

<table>
<thead>
<tr>
<th>Water Supply Option or Strategy</th>
<th>Operational Improvements</th>
<th>Availability(^{(a)})</th>
<th>Dry Year Yield(^{(b)})</th>
<th>Average Annual Yield(^{(c)})</th>
<th>Peak Day Capacity, mgd(^{(d)})</th>
<th>Estimated Timing: Supply is Available to Zone 7(^{(e)})</th>
<th>Total Costs (does not reflect funding source)</th>
<th>Included in Portfolio Analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>af mgd</td>
<td>af mgd</td>
<td>mgd</td>
<td>mgd</td>
<td>2011 - 2015</td>
<td>Capital Cost, ($/year)</td>
<td>Annual Operation and Maintenance Cost ($/year)</td>
</tr>
<tr>
<td><strong>Operational Improvements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Loss Reduction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction of Mocho Demineralization Losses (20% to 15%)</td>
<td>Available during all hydrologic conditions</td>
<td>260</td>
<td>0.23</td>
<td>260</td>
<td>0.230</td>
<td>0</td>
<td>2011 - 2015</td>
<td>$100,000</td>
</tr>
<tr>
<td>Reduction of Unaccounted-for Water</td>
<td>Available during all hydrologic conditions</td>
<td>1,300</td>
<td>1.2</td>
<td>1,300</td>
<td>1.2</td>
<td>2.4</td>
<td>2011 - 2015</td>
<td>$500,000</td>
</tr>
<tr>
<td>Reduction of Well Startup Waste</td>
<td>Available during all hydrologic conditions</td>
<td>&lt; 100</td>
<td>&lt; 0.1</td>
<td>&lt; 100</td>
<td>&lt; 0.1</td>
<td>0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Reduction of Cawelo and Semitropic Losses</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

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Note: The table includes the following columns: Water Supply Option or Strategy, Operational Improvements, Availability, Dry Year Yield, Average Annual Yield, Peak Day Capacity, Estimated Timing, Total Costs, Included in Portfolio Analysis?

---

Location: /zones7/WaterSystem/2010 Master Plan/2010/Updated/Task/ImpactAppendixAppendices/Appendix E - Options Tasks/Appendices E - Options Table.xlsx

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### Appendix E. Summary of the Comprehensive List of Water Supply Options Considered in the Water Supply Evaluation

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<th>Availability(^{(a)})</th>
<th>Dry Year Yield(^{(b)}) af</th>
<th>Average Annual Yield(^{(b)}) af</th>
<th>Peak Day Capacity, mgd(^{(c)})</th>
<th>Estimated Total Costs (does not reflect funding source)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Estimated Timing: Supply is Available to Zone 7(^{(d)})</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Operation and Maintenance Cost, $/year(^{(e)})</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Amortized Cost, $/acre-foot(^{(f)})</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Included in Portfolio Analysis?</td>
</tr>
<tr>
<td><strong>Recharge Capacity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance Existing In-Lieu Recharge Program</td>
<td>Depends on hydrologic conditions</td>
<td>0</td>
<td>0</td>
<td>Additional Recharge in Main Basin: 500 to 830 af/yr</td>
<td>2011 - 2020 $200,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Additional Recharge in Main Basin: 0.4 to 0.7</td>
<td>$40,000 to $66,400</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$100 to $110 per acre-foot of additional storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YES - this is a &quot;no regret&quot; action included in all portfolios.</td>
</tr>
<tr>
<td>Aquifer Storage and Recovery in Main Basin</td>
<td>Depends on hydrologic conditions &amp; system capacity</td>
<td>0</td>
<td>0</td>
<td>Additional recharge in Main Basin: 3,000 af/yr</td>
<td>2015 - 2020 $2,800,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Additional Supply in Main Basin: 2.7</td>
<td>$600,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$260 per acre-foot of additional storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Not at this time due to like benefit already planned as part of the Chain of Lakes.</td>
</tr>
<tr>
<td>In Stream Infiltration via Swales</td>
<td>Depends on hydrologic conditions</td>
<td>0</td>
<td>0</td>
<td>Additional Supply in Main Basin: 830 af/yr</td>
<td>2015 - 2020 $7,800,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Additional Recharge in Main Basin: 0.7</td>
<td>$1,560,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$260 per acre-foot of additional storage</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Not at this time due to like benefit already planned as part of the Chain of Lakes.</td>
</tr>
<tr>
<td><strong>Water Conservation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potable Demand Reductions (Water Conservation Act of 2009)</td>
<td>Available during all hydrologic conditions</td>
<td>3,000 to 6,000</td>
<td>2.7 to 5.4</td>
<td>3,000 to 6,000</td>
<td>2015 - 2020 Depends on the methodology used by each water supply retailer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.7 to 5.4</td>
<td>Depends on the methodology used by each water supply retailer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.4 to 10.8</td>
<td>Depends on the methodology used by each water supply retailer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YES - it was assumed that Zone 7 would continue to work with the water supply retailers to achieve water conservation targets; all portfolios were evaluated assuming 6,000 AF of demand reduction associated with the Water Conservation Act of 2009.</td>
</tr>
</tbody>
</table>

\(^{(a)}\) Availability refers to the hydrologic conditions the water supply is available.

\(^{(b)}\) DRY YEAR YIELD: The supply available during single dry or multiple dry years.

\(^{(c)}\) AVERAGE YIELD: The long-term average supply available over various hydrologic conditions.

\(^{(d)}\) Capacity available to help meet maximum day demands during the summer months. Unless limited by facilities, based on a peaking factor of 2.0 times the average supply.

\(^{(e)}\) Potential timing is the projected years that the supply would become available to Zone 7, after planning, design, CEQA, and construction.

\(^{(f)}\) Capital costs include all of the additional one-time costs to obtain, convey, treat, and deliver the water supply.

\(^{(g)}\) Operation and Maintenance costs include all of the annual expenses necessary to maintain the supply (e.g., power and chemical costs).

\(^{(h)}\) For comparative purposes, all costs were amortized based on 6 percent interest over a 30 year term.
APPENDIX F: KEY SUPPORTING STORAGE AND FACILITY OUTAGE FIGURES
KEY SUPPORTING STORAGE FIGURES FROM THE RISK MODEL
Current Plan - Main Basin Storage: 85%
Current Plan - Semitropic: 85%

Storage, acre-feet

Year

- First Quartile  ● 1st Percentile  ■ Median  ◆ 99th Percentile  - Third Quartile
Current Plan - Cawelo: 85%
In-Valley - Main Basin Storage: 80%
In-Valley - Main Basin Storage: 85%

Storage, acre-feet

Year

- First Quartile
- Third Quartile
- 1st Percentile
- Median
- 99th Percentile
- Historic Low
- +/- 5% of Historic Low
In-Valley - Main Basin Storage: 99%
Intertie - Main Basin Storage: 95%
Intertie - Semitropic: 85%

- First Quartile
- 1st Percentile
- Median
- 99th Percentile
- Third Quartile
KEY SUPPORTING FACILITY OUTAGE FIGURES
Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.
Current Plan & Intertie: South Bay Aqueduct Out of Service

- Shortage
- Well Production Capacity Per Well Master Plan
- Well Peak Production Capacity/Normal Operations
- Limited DVWTP Capacity without SBA Pumps

Year

Current Plan & Intertie: South Bay Aqueduct Out of Service

- Shortage
- Well Production Capacity Per Well Master Plan
- Well Peak Production Capacity/Normal Operations
- Limited DVWTP Capacity without SBA Pumps

Location: \\zone7-file\working_files\WSE\Planning\Water System Master Plan\2010 Update\Tasks\Task 3\D\C\LUC\Less than 1% Chance\100\Facilities Model\100 LUC_D-C.xlsx
In-Valley - Patterson Pass WTP Out of Service: 75%
Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.
In-Valley - South Bay Aqueduct Out of Service: 75%

- **Shortage**
- **Well Production Capacity Per Well Master Plan**
- **Well Peak Production Capacity/Normal Operations**
- **Limited DVWTP Capacity without SBA Pumps**

Location: `\zone7-file\working_files\WSE\Planning\Water System Master Plan\2010 Update\Tasks\Task 3\ND\C\IV\75%\Facilities Model\75 IV_ND-C.xlsx`
In-Valley - Patterson Pass WTP Out of Service: 80%

Well Production Capacity Per Well Master Plan
Well Peak Production Capacity/Normal Operations
DVWTP Peak Capacity
75% of Max Day Demand

Location: \\zone7-file\working_files\WSE\Planning\Water System Master Plan\2010 Update\Tasks\Task 3\ND\C\IV\80%\Facilities Model\80 IV_ND-C.xlsx
In-Valley - Del Valle WTP Out of Service: 80%

Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.
In-Valley - Largest Well Field Out of Service: 85%

Year

- Well Production Capacity Per Well Master Plan
- Limited Well Peak Production Capacity for Normal Operations
- PPWTP UF
- PPWTP CV
- DVWTP
- Max Day

Location: \zone7\file\working_files\WSE\Planning\Water System Master Plan\2010 Update\Tasks\Task 3\ND\C\IV\85\Facilities Model\85 IV ND-C.xlsx
In-Valley - Patterson Pass WTP Out of Service: 85%

Well Production Capacity Per Well Master Plan
Well Peak Production Capacity/Normal Operations
DVWTP Peak Capacity
75% of Max Day Demand
In-Valley - Del Valle WTP Out of Service: 85%

Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.

[Diagram showing water demand and capacity over time with key notes provided.]
In-Valley - Largest Well Field Out of Service: 90%
Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.
Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.
In-Valley - Del Valle WTP Out of Service: 99%

Notes:
- Analysis includes existing facilities and planned future well capacity.
- Maximum Day Demand is estimated using peaking factor of 2.0 times the annual average demand.
- Assumes water conservation.
APPENDIX G. RECYCLED WATER SUPPLY ESTIMATES

This appendix provides a brief summary of the analysis used to estimate the amount of recycled water supply available in the Livermore-Amador Valley (Valley), beyond those supplies already allocated to existing programs, to help reduce potable water demands. The following sections describe the analysis:

- Potential Sources of Recycled Water Supply
- Summary of Recycled Water Supply Already Allocated to Existing Programs
- Estimated Recycled Water Available in the Valley

Potential Sources of Recycled Water Supply

The City of Livermore (Livermore) and Dublin San Ramon Services District (DSRSD) currently collect all of the wastewater produced within the city limits of Pleasanton, Dublin, and Livermore, and portions of San Ramon. Wastewater transport out of the area is handled through the Livermore-Amador Valley Water Management Agency (LAVWMA), a joint powers authority (JPA) composed of DSRSD, Livermore, and Pleasanton. Since 1979, LAVWMA has owned the conveyance facilities that ship treated wastewater from the treatment plants west over the Dublin grade, and eventually to the East Bay Discharge Authority, which dechlorinates the effluent and discharges it through a deep water pipeline into San Francisco Bay.

Livermore Water Recycling Plant

The original plant located along Jack London Boulevard was constructed in 1958 with a capacity of 2.5 million gallons per day (MGD).1 Livermore added tertiary treatment capacity in 1974, and after several upgrades, the plant can currently treat 9.5 MGD of wastewater.2 Based on conversations with Livermore staff, the plant may be expanded to 10.5 MGD in the future.3 The plant is also rated to produce 6.0 MGD of tertiary-treated water for use as a recycled water supply; based on conversations with Livermore staff, the plant may be re-rated to 6.5 MGD.4 For the analysis in this WSE, Zone 7 staff limited the analysis to future capacity and therefore, used secondary and tertiary capacities to 10.5 and 6.0 MGD, respectively.

DSRSD Water Recycling Plant

DSRSD’s plant is located south of I-580, near the intersection of I-580 and I-680. The plant can treat 17 MGD to secondary levels, and will eventually have the capacity to treat 20.7 MGD. The plant is currently rated to produce 9.7 MGD of tertiary water for use as a recycled water supply, and will eventually be expanded to 16.5 MGD. For the analysis in this WSE, Zone 7 staff limited the analysis to future capacity and therefore, used secondary and tertiary capacities to 20.7 and 16.5 MGD, respectively.

Monthly Secondary Effluent Ratios

Zone 7 staff reviewed historical data from 2006 to 2009 to generate monthly ratios for projecting future secondary effluent available. The data is provided to Zone 7 by both Livermore and DSRSD.

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1 City of Livermore Website: http://www.cityoflivermore.net/citygov/pw/wrd/wastewater/lwrp.asp
3 Meeting with the City of Livermore on February 23, 2010.
4 Meeting with the City of Livermore on February 23, 2010.
Summary of Recycled Water Supply Already Allocated to Existing Programs

In Livermore, tertiary-treated water (mono-filtration followed by ultraviolet [UV] disinfection) is used to irrigate Livermore’s Municipal Golf Course, Las Positas College, business parks along the north side of I-580 and the west side of Highway 84, and Highway 84 corridor landscapes. Livermore has been irrigating its golf course with recycled water since the 1960s. In Livermore, recycled water use was 988 AF in 2009. Livermore’s facilities can produce up to 5,600 acre-feet annually (AFA)\(^5\) should the demand increase.

In 1995, DSRSD and East Bay Municipal Utility District (EBMUD), formed a JPA called the “DSRSD-EBMUD Recycled Water Authority” (DERWA). This entity operates the San Ramon Valley Recycled Water Program (SRVRWP), which supplies recycled water to portions of DSRSD’s and EBMUD’s service areas. Through the SRVRWP, DSRSD began supplying tertiary-treated water (sand filtration or microfiltration followed by UV disinfection) in 2006 for landscape irrigation. As of August 2007, SRVRWP was providing recycled water to over 170 customer sites. Its facilities are sized to provide up to 3,700 AF of recycled water annually to DSRSD and an additional 2,700 AF to EBMUD\(^6\). In 2009, DSRSD supplied 2,100 AF of recycled water.

A summary of the wastewater quantities already allocated to existing programs is provided in Table G-1. As shown in Table G-1, Livermore and DSRSD – collectively – plan to produce approximately 5,900 AF.

<table>
<thead>
<tr>
<th>Type</th>
<th>Secondary and Tertiary Already Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livermore(^{[a]})</td>
<td>2,200</td>
</tr>
<tr>
<td>DSRSD(^{[b]})</td>
<td>3,700</td>
</tr>
<tr>
<td><strong>Total within the Valley</strong></td>
<td><strong>5,900</strong></td>
</tr>
<tr>
<td>EBMUD(^{[b]})</td>
<td>2,700</td>
</tr>
<tr>
<td><strong>Total Already Allocated</strong></td>
<td><strong>8,600</strong></td>
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</table>

\(^{[a]}\) Per discussions with Livermore staff on 2/23/2010.
\(^{[b]}\) Per discussions with DSRSD staff on 4/14/2010.

Assumed Monthly Recycled Water Use

Based on historical data from 2006 to 2009, Zone 7 staff then developed ratios for allocating secondary effluent and planned recycled water use on a monthly basis. Zone 7 staff then used the capacity limits of existing tertiary facilities and monthly demand ratios estimated using historical data from 2006 to 2009 to determine the amount of secondary effluent available – beyond those supplies already allocated to existing plans – to provide potable water demand offsets. This analysis also allowed Zone 7 staff to estimate the amount recycled water supply that required storage.

Table G-2 presents a summary of available recycled water supply. Figure G-1 presents the monthly demand ratios used to allocate supply on a monthly basis to determine storage requirements, while Figure G-2 presents a graphical summary of the available secondary effluent.

\(^6\) http://www.derwa.org/pdf/DERWA_quick_facts.pdf
## Table G-2. Summary of Available Recycled Water Supply

<table>
<thead>
<tr>
<th>Retailer</th>
<th>Component</th>
<th>Direct</th>
<th></th>
<th>Storage&lt;sup&gt;(a)&lt;/sup&gt;</th>
<th></th>
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<tr>
<td></td>
<td></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
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<tr>
<td>Pleasanton</td>
<td>Supply, af</td>
<td>2,600</td>
<td>2,600</td>
<td>3,600</td>
<td>3,600</td>
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<tr>
<td></td>
<td>Supply, mgd</td>
<td>2.3</td>
<td>2.3</td>
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<tr>
<td></td>
<td>Additional Capacity Required, mgd&lt;sup&gt;(b)&lt;/sup&gt;</td>
<td>6.7</td>
<td>6.7</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>DSRSD</td>
<td>Supply, af</td>
<td>0</td>
<td>--</td>
<td>6,600</td>
<td>6,600</td>
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<tr>
<td></td>
<td>Supply, mgd</td>
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<td>5.9</td>
<td>5.9</td>
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<tr>
<td></td>
<td>Additional Capacity Required, mgd&lt;sup&gt;(b)&lt;/sup&gt;</td>
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<td>--</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Livermore</td>
<td>Supply, af</td>
<td>0</td>
<td>3,700</td>
<td>5,700</td>
<td>5,860</td>
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<tr>
<td></td>
<td>Supply, mgd</td>
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<td>3.3</td>
<td>5.1</td>
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<td></td>
<td>Additional Capacity Required, mgd&lt;sup&gt;(b)&lt;/sup&gt;</td>
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<td>9.6</td>
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<tr>
<td>Total</td>
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<td>2,600</td>
<td>6,300</td>
<td>15,900</td>
<td>16,060</td>
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<td>5.6</td>
<td>14.2</td>
<td>14.3</td>
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<tr>
<td></td>
<td>Additional Capacity Required, mgd&lt;sup&gt;(b)&lt;/sup&gt;</td>
<td>6.7</td>
<td>16.3</td>
<td>0.0</td>
<td>0.4</td>
</tr>
</tbody>
</table>

<sup>(a)</sup> Assumes all supply is treated before storage, and is based on availability from Oct to May.

<sup>(b)</sup> Direct capacity is based on a peaking factor of 2.9 times the annual average supply. Storage capacity is based on operating the plant from Oct to May unless existing capacity is enough to treat supplies available from Oct to May.

## Figure G-1. Monthly Ratios Used to Estimate Recycled Water Storage Requirements

**Notes:**
- Monthly ratios based on historical data between 2006 and 2009.
Figure G-2. Average Monthly Recycled Water Supply and Demand at Buildout

Notes:
- DERWA Supply from Pleasanton: up to 2,800 af (2.5 mgd averaged over a 1-year period), assumes DERWA uses Pleasanton supply first for planning purposes
- Livermore Demand: ~2,200 af at Buildout
- Monthly secondary effluent and demands based on historical monthly ratios between 2006 and 2009.
APPENDIX H: CEQA EXEMPTION
FORM 4. ENVIRONMENTAL DECLARATION

(Calif. Fish and Game Code Sec. 711.4)

NAME AND ADDRESS OF APPLICANT OR LEAD AGENCY:

Zone 7 Alameda County Flood Control and Water Conservation District
100 North Canyons Parkway
Livermore, CA 94551

Attn: Mary Lim

CLASSIFICATION OF ENVIRONMENTAL DOCUMENT:

1. NOTICE OF EXEMPTION/STATEMENT OF EXEMPTION
   a. ☑ A—STATUTORILY OR CATEGORICALLY EXEMPT
      $50.00 (Fifty Dollars) — CLERK'S FEE
   □ B—DE MINIMUS IMPACT — CERTIFICATE OF FEE EXEMPTION REQUIRED
      $50.00 (Fifty Dollars) — CLERK'S FEE

2. NOTICE OF DETERMINATION — FEE REQUIRED
   □ A—NEGATIVE DECLARATION
      $2,044.00 (Two Thousand and Forty Four Dollars) — STATE FILING FEE
      $50.00 (Fifty Dollars) — CLERK'S FEE
   □ B—ENVIRONMENTAL IMPACT REPORT
      $2,839.25 (Twenty Eight Hundred and Thirty Nine Dollars and Twenty Five Cents) — STATE FILING FEE
      $50.00 (Fifty Dollars) — CLERK'S FEE

3. □ OTHER (Specify)
   Notice of Finding of No Significant Impact
   $50.00 (Fifty Dollars) — CLERK'S FEE

* THIS FORM MUST BE COMPLETED AND SUBMITTED WITH ALL ENVIRONMENTAL DOCUMENTS FILED WITH THE ALAMEDA COUNTY CLERK'S OFFICE.

FIVE COPIES OF ALL NECESSARY DOCUMENTATION ARE REQUIRED FOR FILING PURPOSES.

APPLICABLE FEES MUST BE PAID AT THE TIME OF FILING AN ENVIRONMENTAL DOCUMENT WITH THE ALAMEDA COUNTY CLERK'S OFFICE.

NOTE TO COUNTY CLERK: PURSUANT TO SECTION 21152 OF THE PUBLIC RESOURCES CODE, THE COUNTY CLERK SHALL POST NOTICES WITHIN 24 HOURS OF RECEIPT IN THE OFFICE OF THE COUNTY CLERK. A NOTICE SHALL REMAIN POSTED FOR A PERIOD OF 30 DAYS. UPON EXPIRATION OF THIS PERIOD, THE CLERK SHALL RETURN THE NOTICE TO THE LEAD AGENCY'S CONTACT PERSON WITH A NOTATION CERTIFYING THE NOTICE WAS POSTED FOR THE PRESCRIBED PERIOD BY LAW.

MAKE CHECK PAYABLE TO: ALAMEDA COUNTY CLERK

Effective January 1, 2011
Notice of Exemption

To: ☑ Office of Planning and Research
   For U.S. Mail:
   P.O. Box 3044
   Sacramento, CA 95812-3044
   Street Address:
   1400 Tenth Street, Room 121
   Sacramento, CA 94514

From: ZONE 7 WATER AGENCY
       100 North Canyons Parkway
       Livermore, CA 94551
       925-454-5000

Date: May 6, 2011

Project Title: 2011 Water Supply Evaluation

Project Number (Zone 7): N/A

Project Location – Specific: Livermore

Project Location – City: Dublin, Livermore, Pleasanton

Project Location – County: Alameda County

Description of Nature, Purpose, and Beneficiaries of Project:

Over the past few decades, Zone 7 Water Agency (Zone 7) has developed a robust water supply system that allowed Zone 7 to store excess water in the wet years and draw on these reserves during dry years to create a reliable and sustainable water supply for the Livermore-Amador Valley (Valley). However, approximately 80% of Zone 7’s water supply is Table A water purchased through the State Water Project (SWP) from the Department of Water Resources – the reliability of the SWP is subject to a very uncertain future due to legal and environmental constraints in the Sacramento-San Joaquin Delta (Delta) and climate change.

In response to this challenge, Zone 7 staff completed a preliminary evaluation of the existing water supply system. This Water Supply Evaluation (WSE) will help Zone 7:

- Develop a diverse set of water supply options and corresponding portfolios that will help identify supplemental studies that might be necessary to assist Zone 7 in refining associated supply yields and limits;
- Evaluate the ability for various water supply portfolios to meet future reliability targets; and
- Identify low-cost, zero-impact actions that will minimize near-term risks of water supply shortages, while maximizing flexibility until more certainty surrounds potential fixes for the SWP.

Name of Public Agency Approving Project: Zone 7 Water Agency

Name of Person or Agency Carrying Out Project: Zone 7 Water Agency
Exempt Status: (check one)

☐ Ministerial (Sec. 21080(b)(1); 15268);
☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
☐ Categorical Exemption. State type and section number:
☐ Statutory Exemptions. State code number:
☒ Not Subject to CEQA under the General Rule of CEQA. See section 15061(b)(3).

Reasons Why Project is Exempt:

The project is not subject to CEQA under the general rule of CEQA that states that CEQA applies only to projects that have a potential for causing a significant effect on the environment. Public Resources Code section 21068 defines “significant effect on the environment” to mean a “substantial, or potentially substantial, adverse change in the environment.” The Water Supply Evaluation recommends conducting various studies to confirm key assumptions, determine limitations, and further evaluate the feasibility of various water supply options. The recommended studies and evaluations will not result in a direct or indirect physical change in the environment because these studies will only provide Zone 7 with additional information.

Lead Agency Contact Person: Brad Ledesma  Area Code/Telephone/Ext: 925-454-5038

<table>
<thead>
<tr>
<th>Signature:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Project Engineer/Manager: Associate Civil Engineer</td>
</tr>
<tr>
<td>Environmental Services:</td>
<td>Zone 7 Water Agency</td>
</tr>
</tbody>
</table>

Date received for filing at County Clerk:  
Date received for filing at OPR:  

CLERK’S CERTIFICATE OF POSTING. Pub. Res. 21152: I certify that a copy of this document was posted at the Recorder’s Office, Oakland, CA, for the period prescribed by law.

Executed at  
Oakland, CA  
Date 06/30/2011  
By  
Deputy
2011 WATER SUPPLY EVALUATION

A Risk-Based Approach To Evaluating
Zone 7 Water Agency’s Water Supply System

July 2011

Zone 7 Water Agency
Livermore, CA