# Marin Municipal Water District
# Meeting the Challenge:
# Water Supply & Demand

January, 2009

# Presentation Outline

- The Challenge
  - Water Supply and Demand
  - Marin's Drought of Record
  - Coming Up Short
- Meeting the Challenge
  - Opportunities for Reducing Demand and Increasing Supply
  - Discussion and Input

# The Challenge

# MMWD's Water Supply

Recycled Water

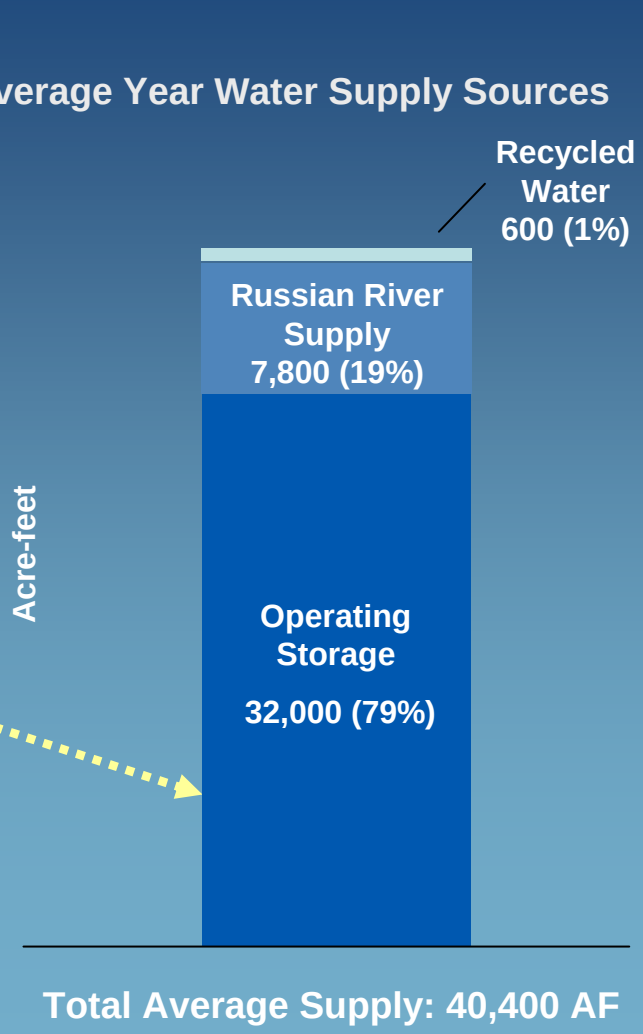
Russian River Pipeline

Operating Storage

Next Year Reserve

Unusable Storage

Reservoir Storage

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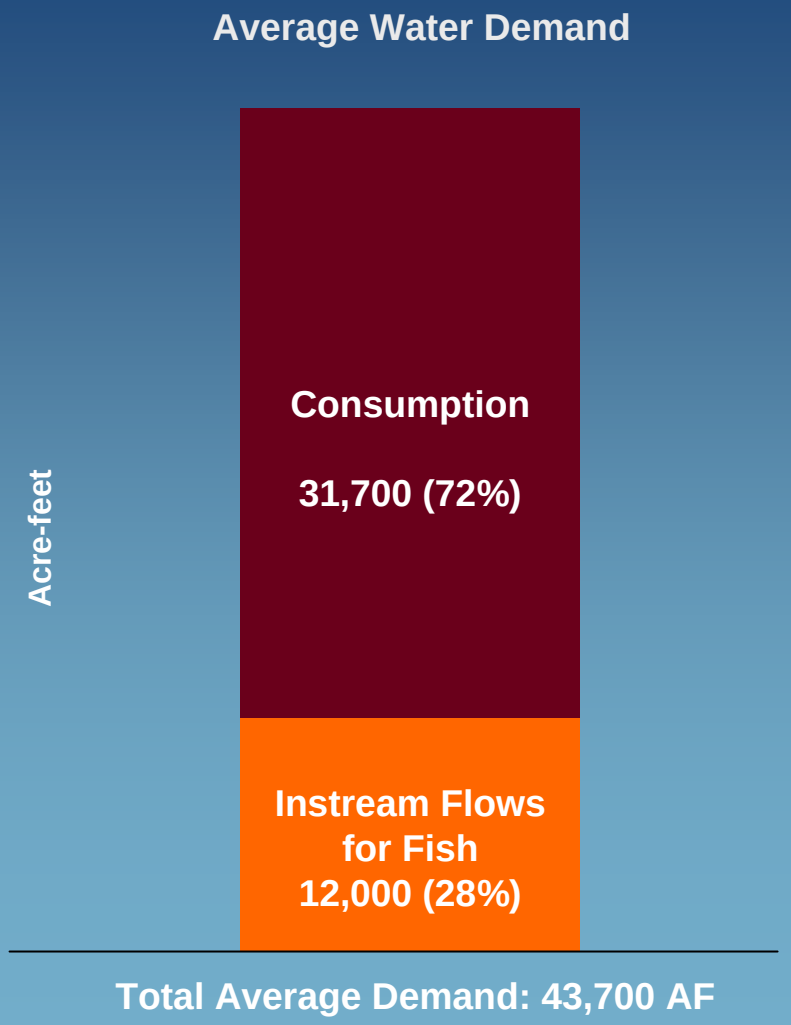
# MMWD's Water Demand

- Two types of water demand in the district
  - Consumption
  - Fish Releases

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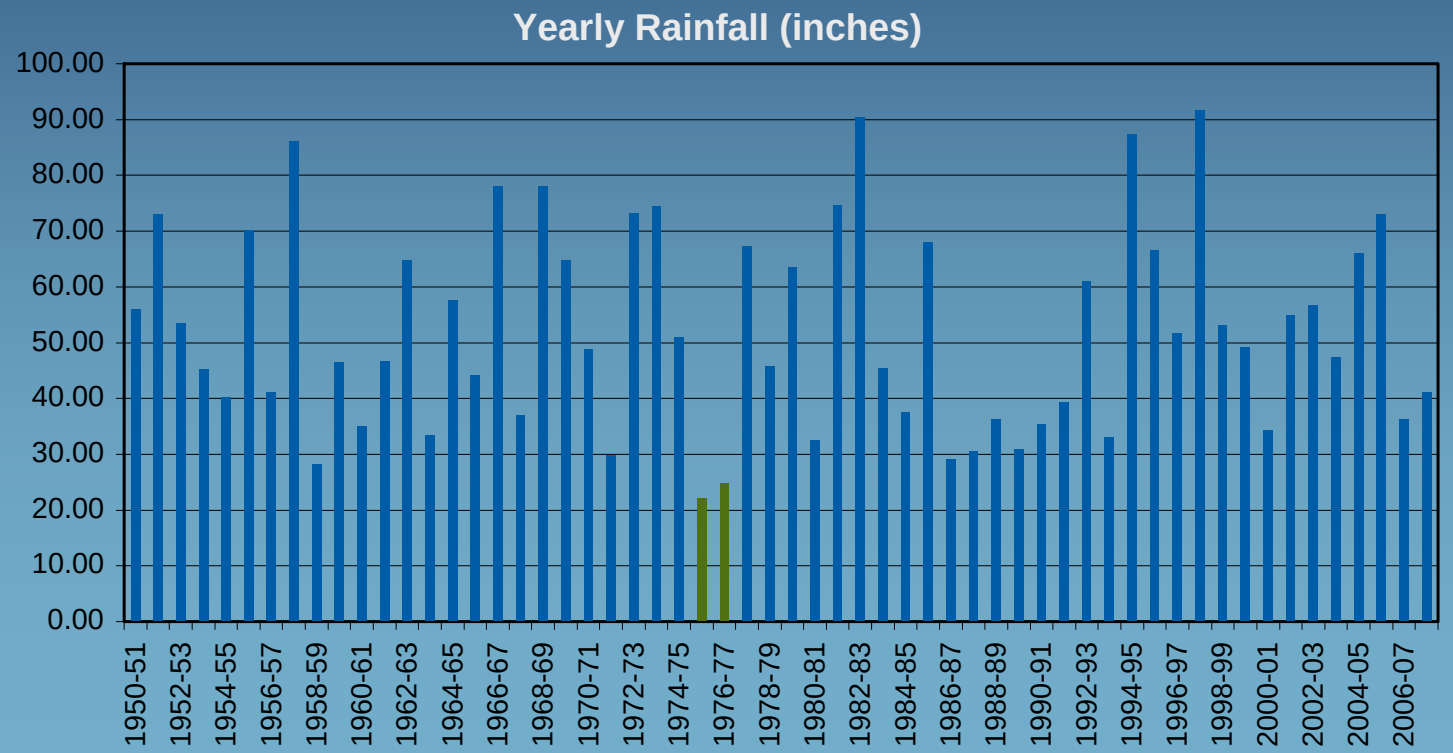
# The Challenge

Given the current water supplies and level of water demand, MMWD would not have adequate water supply to meet the needs of people and the environment during a sustained drought similar to the one experienced in the late 1970s.

# The Drought of Historic Record

- During the 1976-77 drought, Marin's rainfall was at historically low levels

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# Water Supply and Demand Improvements Since 1977

- Soulajule Reservoir (1979)
- Russian River supply contracts (1988 and 1996)
- Expanded Kent Reservoir (1982)
- Reduced per capita water consumption
- Established a rationing policy for droughts


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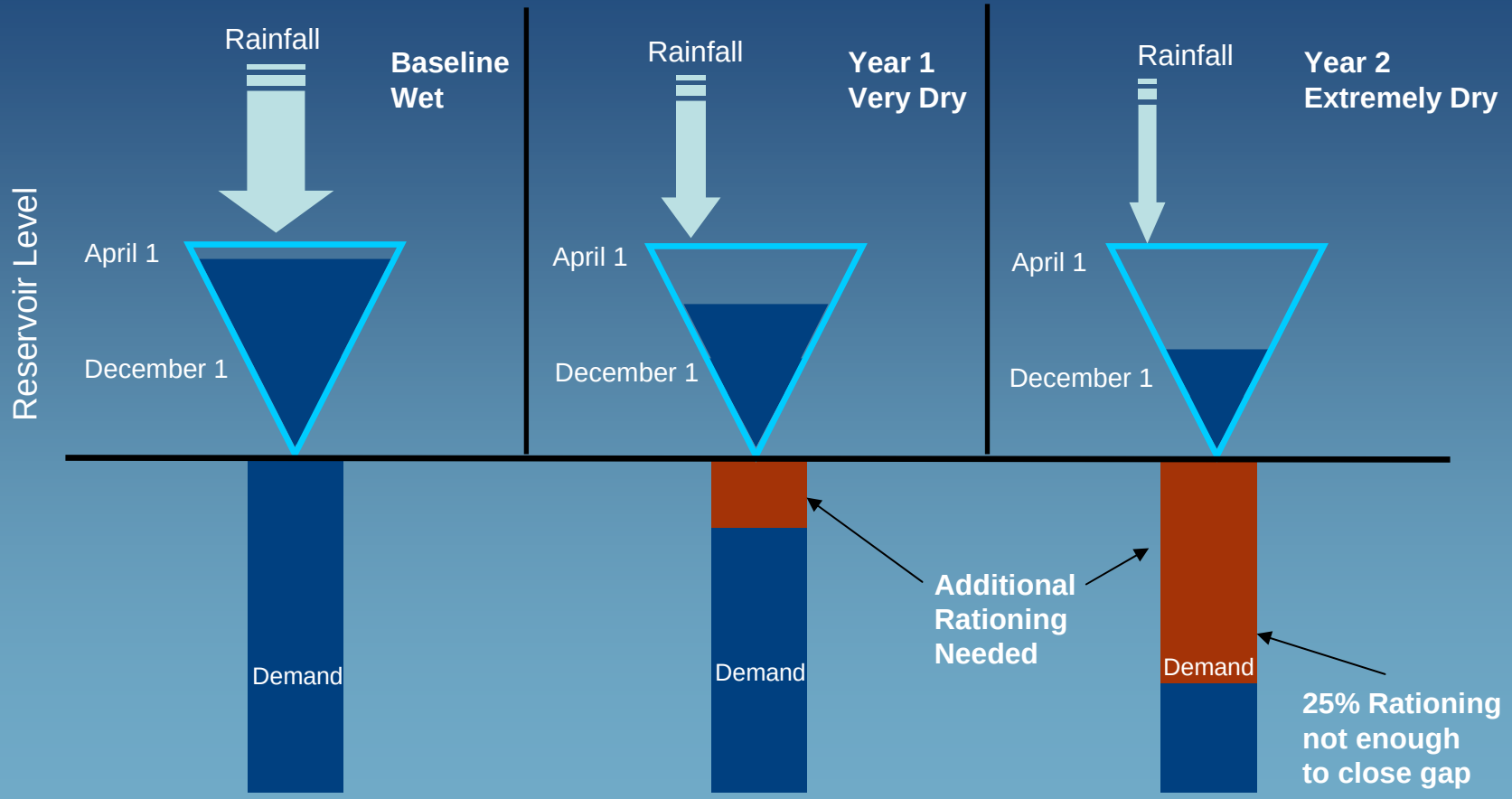
# Rationing Plan

- Rationing plan
  - 10% voluntary use reduction in the first year of a severe drought
  - Mandatory rationing to achieve 25% savings in water use in the second year
- Even with the additional supplies developed and this mandatory rationing:
  - MMWD reservoirs would run out of water in the second year of a severe drought

# Repeat of the 1976-1977 Drought

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# The Bottom Line

- MMWD does not have adequate water supply to meet regulated fish requirements and customer needs during a sustained drought
- By the year 2025 the supply-demand deficit will more than double to 6,700 acre-feet per year
- To address this deficit, Marin must increase water supply and reduce water demand

# Meeting the Challenge

# The First Step: Water Conservation

- MMWD Board has already committed to an aggressive conservation program
- Investing $44 million in staffing, rebates, incentives, and education

- Expecting a matching $96 million in customer investment
- Current conservation program will cut long-term deficit in half

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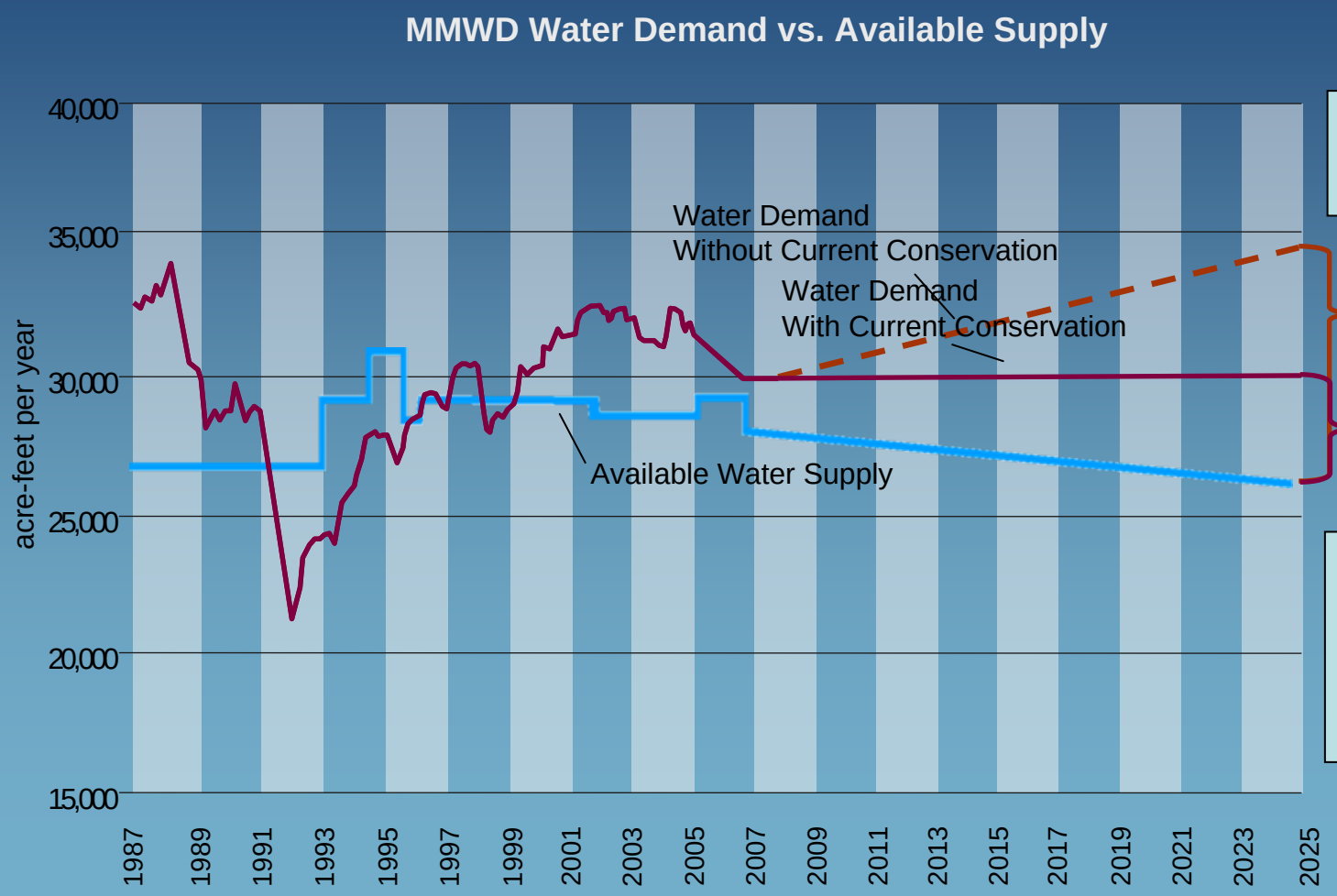
# The Long-Term Deficit




Shortage without current conservation plan: **6,700** Acre-feet per year

Demand reduction with current conservation plan: **3,400** Acre-feet per year

Remaining shortage: **3,300** Acre-feet per year

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# Closing the Gap

## Opportunities Being Investigated

| Increase Supply | Reduce Demand |
| --- | --- |
| • Desalination<br>• Increase Russian River Supply<br>• Modify Reservoir Operations | • Further Increase Water Conservation<br>• Increase Recycled Water |

# Desalination

- 5 million gallon-per-day (MGD) facility
  - Site near Richmond Bridge, with an intake on the Marin Rod & Gun Club pier
  - Brine disposal through the existing wastewater treatment plant water discharge pipeline
  - Supplies MMWD distribution system
- 1 MGD facility
  - Supplies San Quentin and adjacent neighborhood


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# Desalination

- Benefits
  - Reliable source of water
  - District-owned and operated
- Considerations
  - More expensive than other options
  - Energy requirements


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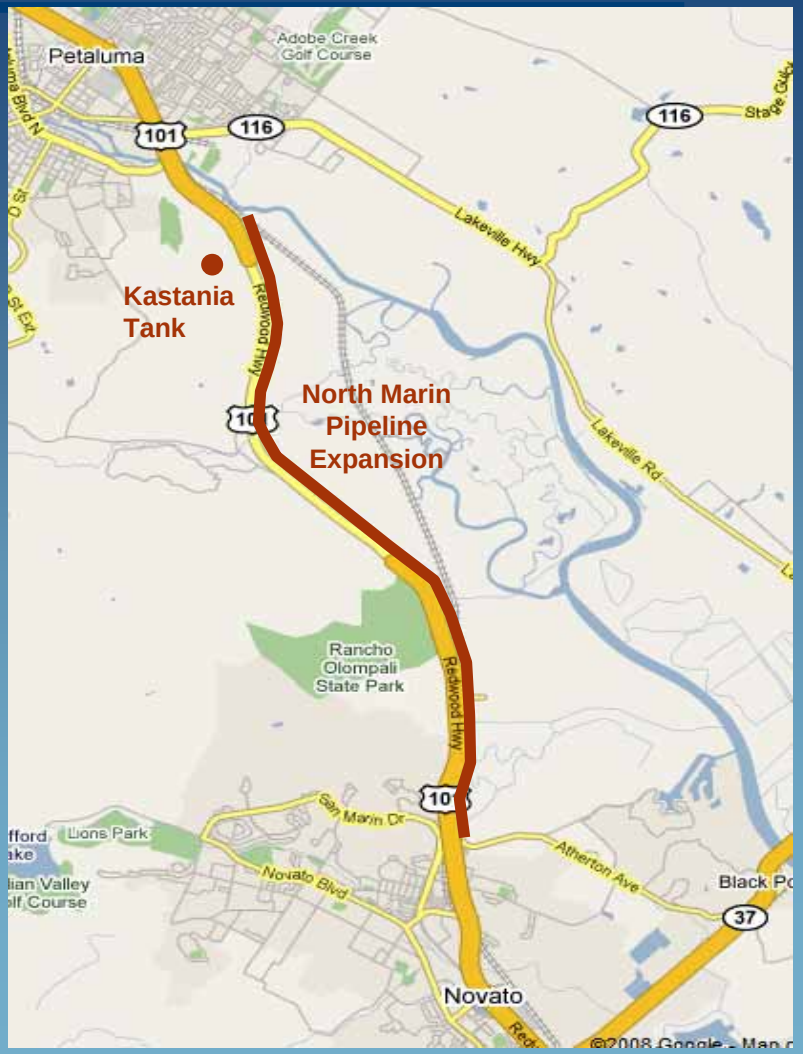
# Russian River Supply Increase

- North Marin Pipeline
  - Enlarge pipeline along Marin-Sonoma Narrows
  - Coordination with North Marin Water District and Caltrans
- Sonoma County Water Agency
  - Pipeline and system improvements within SCWA
  - Coordination with SCWA

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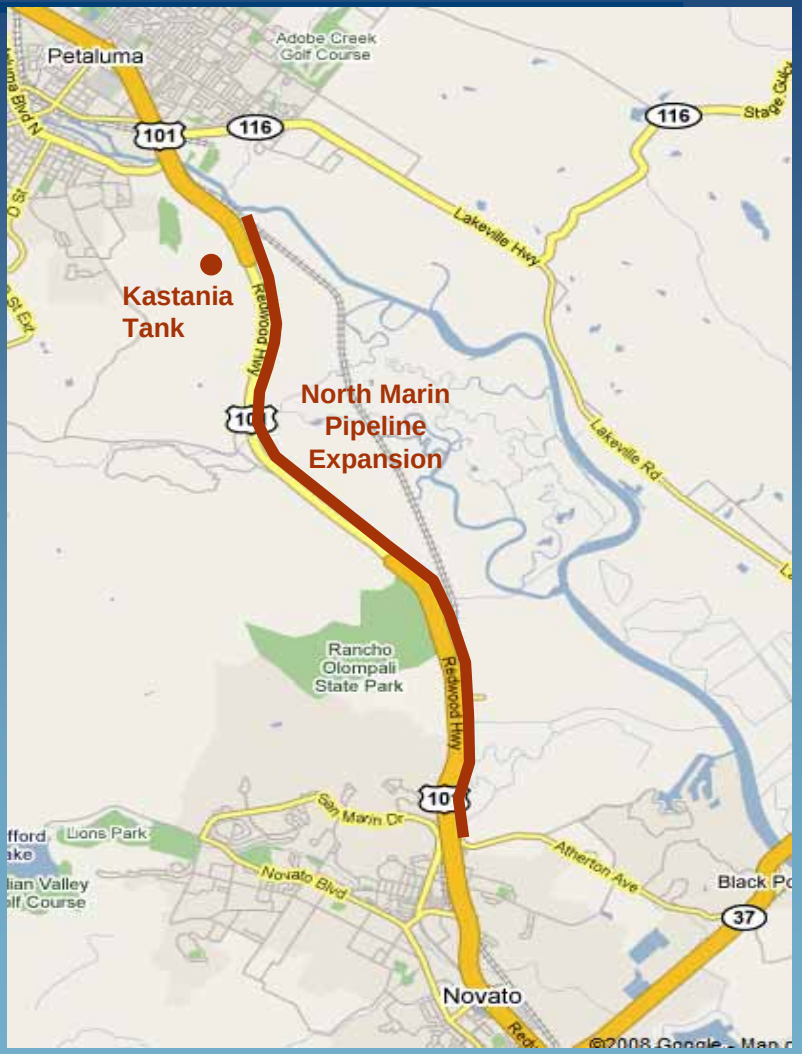
# Russian River Supply Increase

- Benefits
  - Least expensive option
  - Water contract already in place
- Considerations
  - Pipeline relies on actions by other water districts
  - Pipeline supply may be unreliable in drought years
  - Supply depends on others completing environmental approvals for diverting water from Russian River

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# Increased Water Conservation

- Benefits
  - Least environmental impact
  - Some program components could be less expensive than other options
- Considerations
  - Demand reduction beyond projections of existing program is uncertain – requires more analysis
  - Relies on ongoing actions and behavior change by thousands of customers
  - Some program elements could be costly

# Recycled Water & Operations

- Expand Recycled Water System
  - Add Peacock Gap golf course and residential customers
- Modify Reservoir Facilities
  - Change intakes, pipes, and pumps
  - Access unused reservoir storage in critically dry years


# Recycled Water & Operations

- Benefits
  - Relatively simple to implement
  - Improve system operations
- Considerations
  - Do not fully close the gap
  - Environmental review and permitting to be completed


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# Opportunities Comparison Criteria

- **Quantity**
  - Amount of Supply or Demand Reduction
- **Cost**
  - Cost per Acre-foot, Rate Impact, Debt Load
- **Timing**
  - When water becomes available or demand is reduced
- **Feasibility**
  - Performance Certainty – Likelihood of providing the expected supply-demand
  - Complexity – Number of partners and permits
  - Flexibility – Response to changes in planning assumptions (climate, population, etc.)
- **Environmental Impacts**
  - Number of significant and unavoidable adverse environmental impacts

# Comparison of Opportunities

| Opportunity | Supply/(Demand) Acre feet/year | Effective Date (Year) | Cost ($/AF) |
|---|---|---|---|
| **Russian River – North Marin Pipeline** | **1,000** | **2011** | **$1,600** |
| **Russian River – SCWA Improvements** | **3,300** | **2015** | **$1,200** |
| **Desalination – 5 MGD** | **3,300** | **2014** | **$3,500** |
| **Desalination – 1 MGD** | **1,000** | **2013** | **$3,600** |
| **Reservoir Operations** | **1,000** | **2011** | **$400** |
| **Conservation – 1300** | **(1,300)** | **2025** | **$1,000/$2,650** |
| **Conservation – 3300** | **(3,300)** | **2025** | **$770/$2,100** |
| **Peacock Gap Recycled Water** | **(300)** | **2011** | **$2,300** |
| **Recycled Water – 21 Phases** | **(1,000)** | **2020** | **$6,200** |

# Portfolios Supply/Savings

| | Maximum Diversity | Marin Pipeline | Marin & Sonoma Pipeline | All Conservation | Local Desalination |
|---|---|---|---|---|---|
| Additional Conservation | | 1,300 AF/Yr | | 3,300 AF/Yr | |
| Desalination | 1,000 AF/Yr | | | | 3,300 AF/Yr |
| Russian River | 1,000 AF/Yr | 1,000 AF/Yr | 2,300 AF/Yr | | |
| Reservoir Operations | 1,000 AF/Yr | 1,000 AF/Yr | 1,000 AF/Yr | | |
| Additional Water Recycling | 300 AF/Yr | | | | |

All provide 3,300 AF/Yr to Balance Supply and Demand

# Financial Comparisons

| | Maximum Diversity | Marin Pipeline | Marin & Sonoma Pipeline | All Conservation | Local Desalination |
|---|---|---|---|---|---|
| Total Costs / AF | $1,600 | $870/ $1,500 | $880 | $770/ $2,100 | $3,000 |
| Debt Service for 30 Years | $5.3 M / Yr | $2.1 M / Yr | $2.0 M / Yr | $0.6 M / Yr | $7.8 M / Yr |
| T1 Rate in 2014 | $4.07 | $3.97 | $3.93 | $3.94 | $4.15 |
| Rate Incr. Above Inf. % | 4.63 | 2.06 | 1.03 | 1.29 | 6.68 |

# What Do You Think?

We need to determine the best approach for Marin now, because some of these options take at least 3 to 5 years to implement

- What considerations are most important to you?
  - Cost, timing, reliability, flexibility, environmental, etc.
- What approach would you take, and why?

# Process Steps

- December 19 – Release Final EIR
- January, 2009
  - Water supply/demand public workshop
  - Economic impacts of drought symposium
  - Discussions with Marin organizations
- February, 2009
  - Certify the Final EIR (February 4)
  - Decision on early actions (February 11)
  - Continuing evaluation of next steps in conservation

# Contact Us

Please let us know your comments and preferences about the opportunities

- Fill out a comment card
- Stay tuned for additional opportunities to participate

For more information

- Website: www.marinwater.org\watersupply
- E-mail: publicinformation@marinwater.org
- Phone: Libby Pischel, 415-945-1421

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