# Recycled Water Basis of Design Reports

*January 2016 Workshop*

# Recycled Water Basis of Design Reports

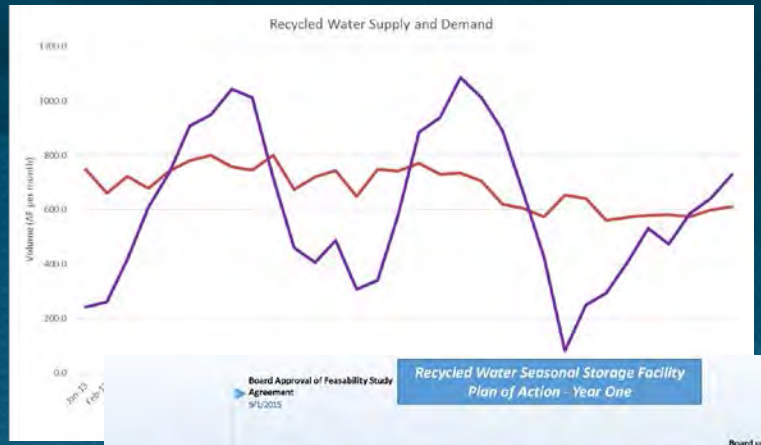
*…Scenario Details*

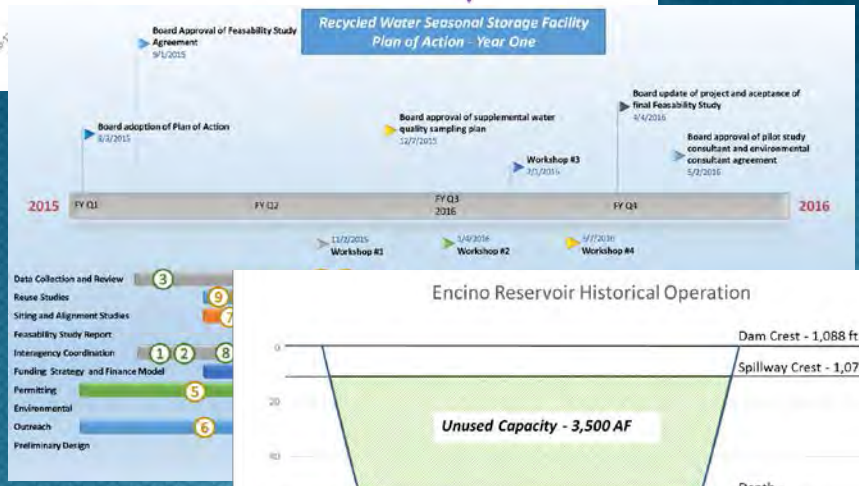
# January Workshop - Agenda

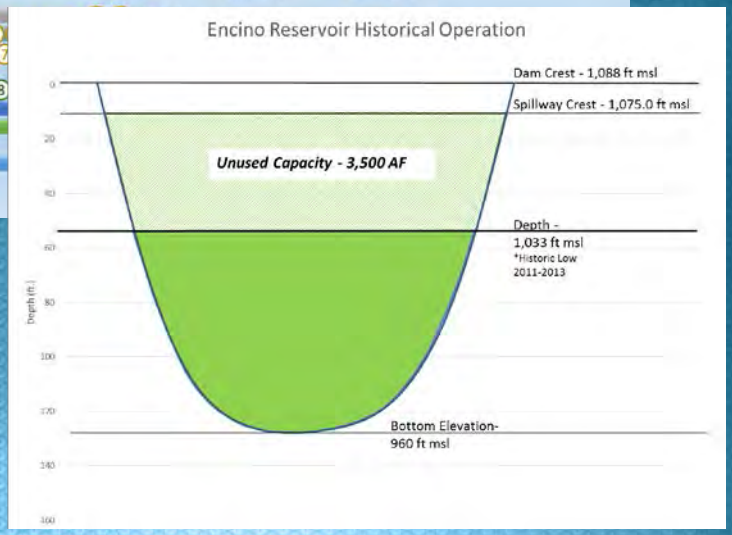
| Time | Item |
|---|---|
| 5:30 – 5:35 | Introduction to Workshop, by General Manager Dave Pedersen |
| 5:35 – 5:40 | Workshop Agenda, presented by Dr. Steve Weber |
| 5:40 – 5:50 | Recap of December Workshop and Discussion of Risks, presented by Steve Weber |
| 5:50 – 6:15 | Exercise #1 - Teamwork |
| 6:15 – 6:30 | Break/ Light dinner |
| 6:30 – 7:30 | Presentation on Scenario 4 and 5 Details, presented by Dr. Steve Weber, James Borchardt, and Oliver Slosser |
| 7:30 – 7:40 | Break |
| 7:40 – 8:10 | Exercise #2 - Criteria |
| 8:10 – 8:15 | Closing and Next Steps, presented by Dave Pedersen |

# December Workshop

- Project Timeline
- Scenario 4 and 5
  - Overview
  - Supply and Demand
  - Reservoir Operations
  - Water Quality
- PESTLE Exercise
  - Risks



# Risk Review

- 159 Risks Identified (PESTLE)
- Each Risk was Categorized and Given an Implementation Group
- Mitigation Strategies Identified for all
- Assigned an Owner

| PESTLE Category | Grand Total |
|---|---|
| Political | 35 |
| Economic | 30 |
| Social | 28 |
| Technical | 29 |
| Legal | 17 |
| Environmental | 20 |
| Grand Total | 159 |

# Risk Summary

| Category | Risks |
|---|---|
| NIMBY | 26 |
| AGENCY COORD | 17 |
| PROJECT COST | 12 |
| DEMAND | 11 |
| WATER QUALITY | 10 |
| DW STANDARDS | 8 |
| YUCK | 8 |
| BRINE | 7 |
| CEQA | 7 |
| POLITICS | 6 |
| ROW/LAND | 6 |
| WATER RIGHTS | 5 |
| LAND COST | 4 |
| OPERATIONS | 4 |
| POWER | 4 |
| TECHNOLOGY | 4 |
| DROUGHT | 3 |
| AWTP COST | 2 |
| EARTHQUAKE | 2 |
| ELECTIONS | 2 |
| HABITAT | 2 |
| IDLE FACILITIES | 2 |
| REGULATORY | 2 |
| CUSTOMER | 1 |
| LIABILITY | 1 |
| PARTNERS | 1 |
| SYSTEM COST | 1 |
| WASTE OF MONEY | 1 |
| **Grand Total** | **159** |

| Owner | Risks |
|---|---|
| FINANCE | 20 |
| GM/JPA BOARD | 14 |
| MWH | 58 |
| OUTREACH | 37 |
| FACILITY DIRECTOR | 30 |
| **GRAND TOTAL** | **159** |

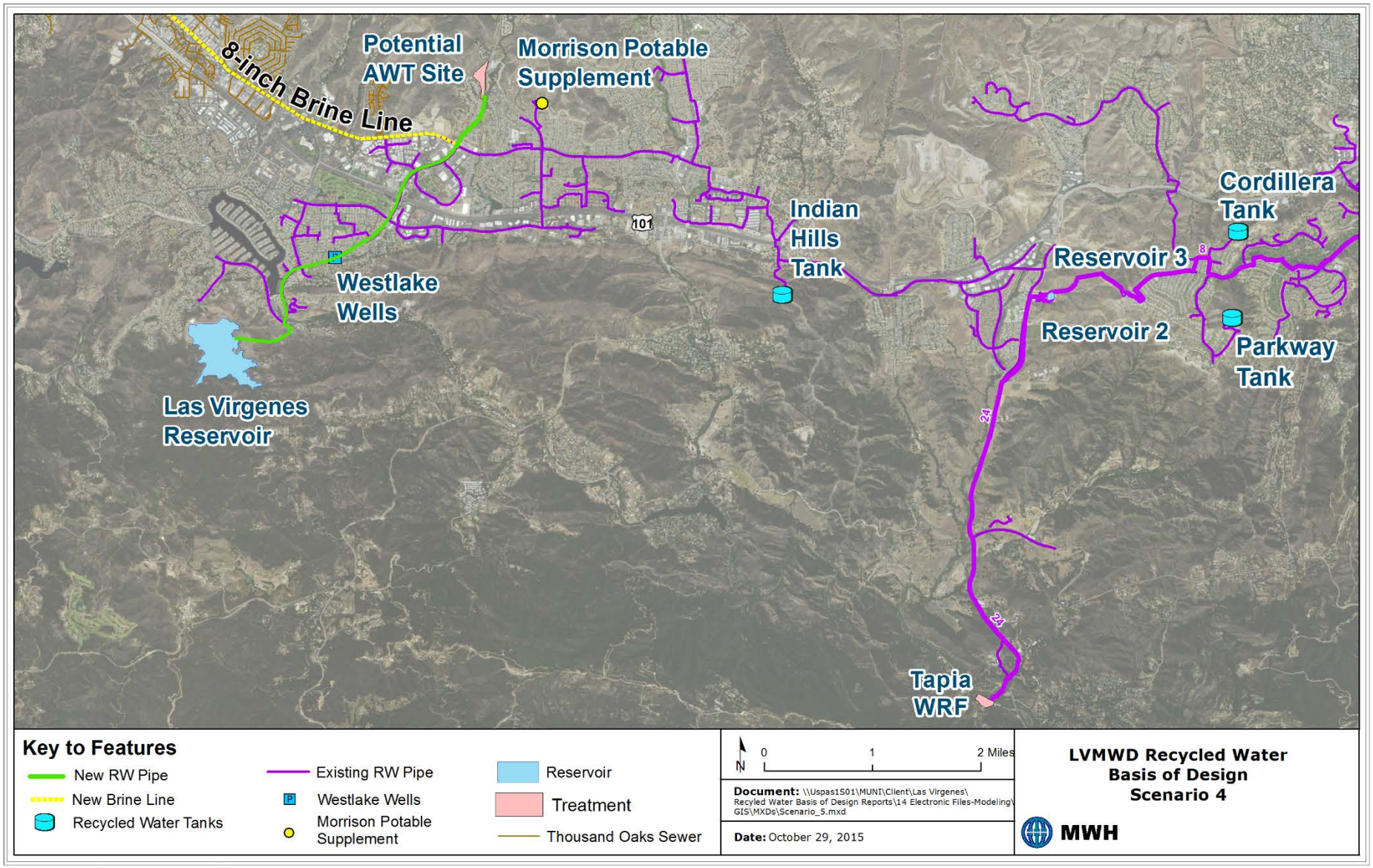
# EXERCISE #1

- Team 1 – 59
- Team 2 – 84
- Team 3 – 119
- Team 4 – 65
- Team 5 – DQ

# BREAK/ LIGHT DINNER

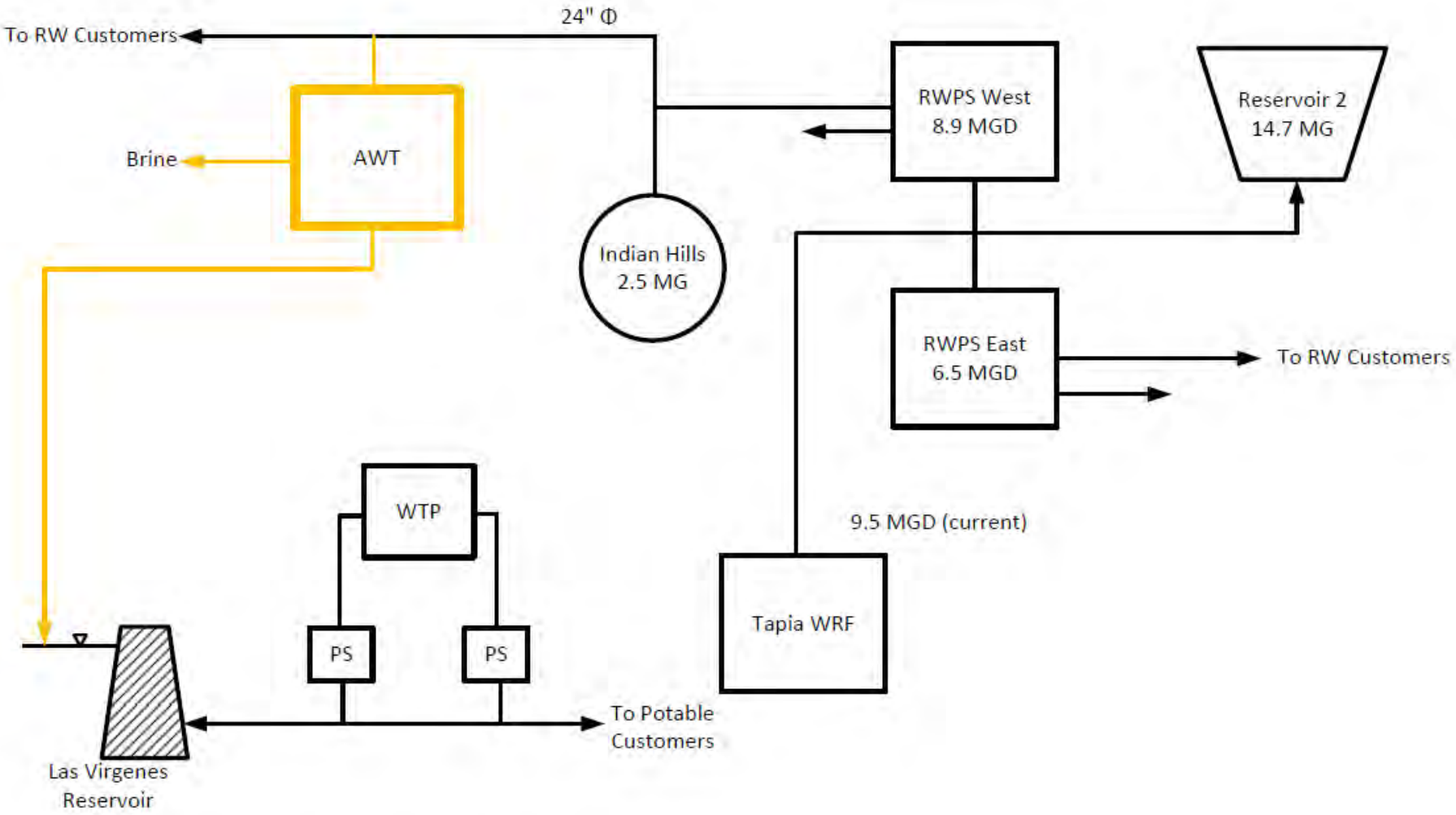
# SCENARIO 4 – INDIRECT POTABLE REUSE USING LAS VIRGENES RESERVOIR

# SCENARIO 4




This map has been designed to print size 11" by 17".

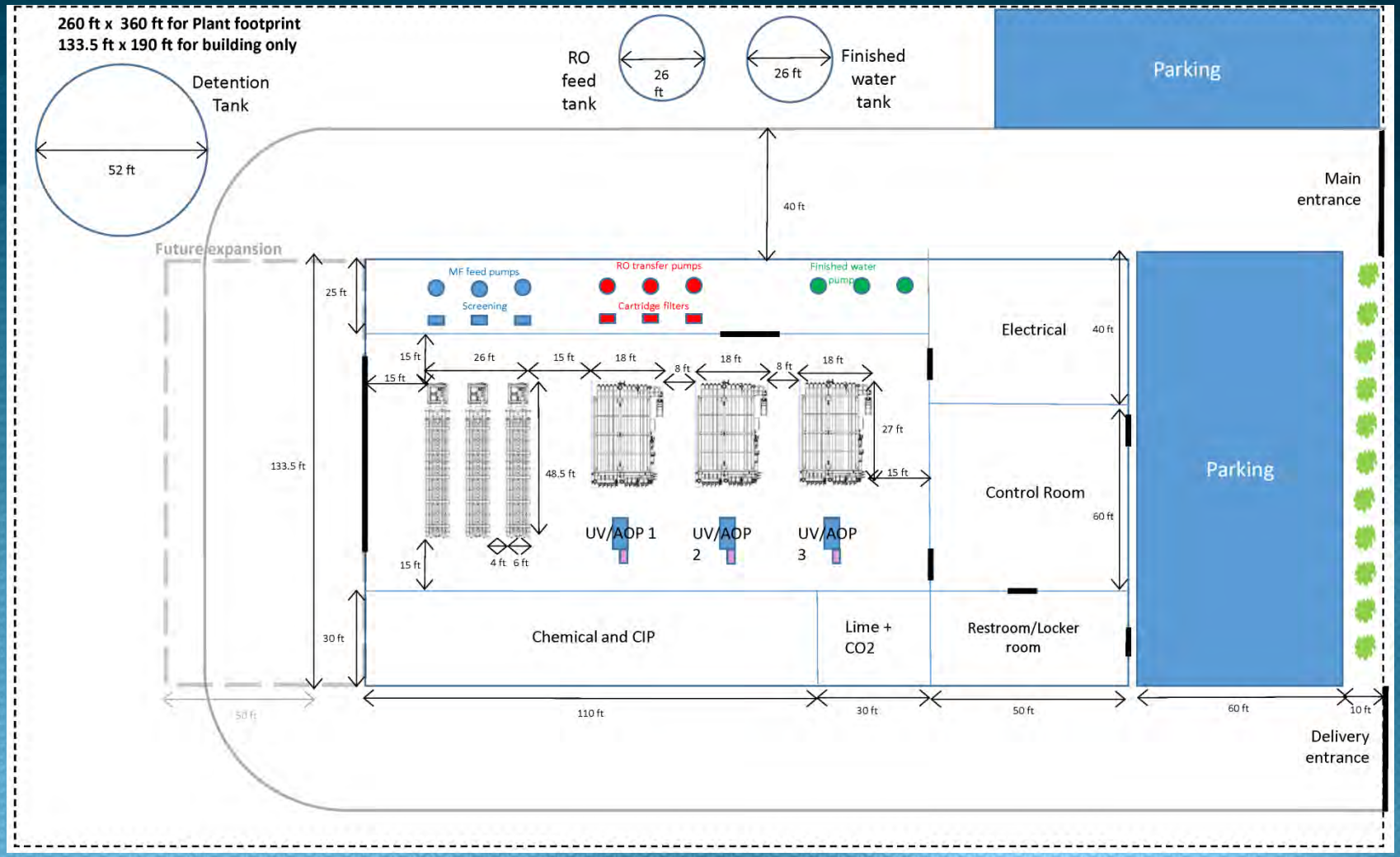
# SCENARIO 4 SCHEMATIC



# Site Layout


This map has been designed to print size 11'' by 17''.

# AWT Layout


260 ft x 360 ft for Plant footprint
133.5 ft x 190 ft for building only
Detention Tank
52 ft
RO feed tank
26 ft
26 ft
Finished water tank
Parking
40 ft
Main entrance
Future expansion
MF feed pumps
Screening
RO transfer pumps
Cartridge filters
Finished water pumps
25 ft
Electrical
40 ft
15 ft
15 ft
26 ft
15 ft
18 ft
8 ft
18 ft
8 ft
18 ft
27 ft
15 ft
133.5 ft
48.5 ft
Control Room
60 ft
Parking
UV/AOP 1
UV/AOP 2
UV/AOP 3
15 ft
4 ft
6 ft
30 ft
Chemical and CIP
Lime + CO2
Restroom/Locker room
50 ft
110 ft
30 ft
50 ft
60 ft
10 ft
Delivery entrance

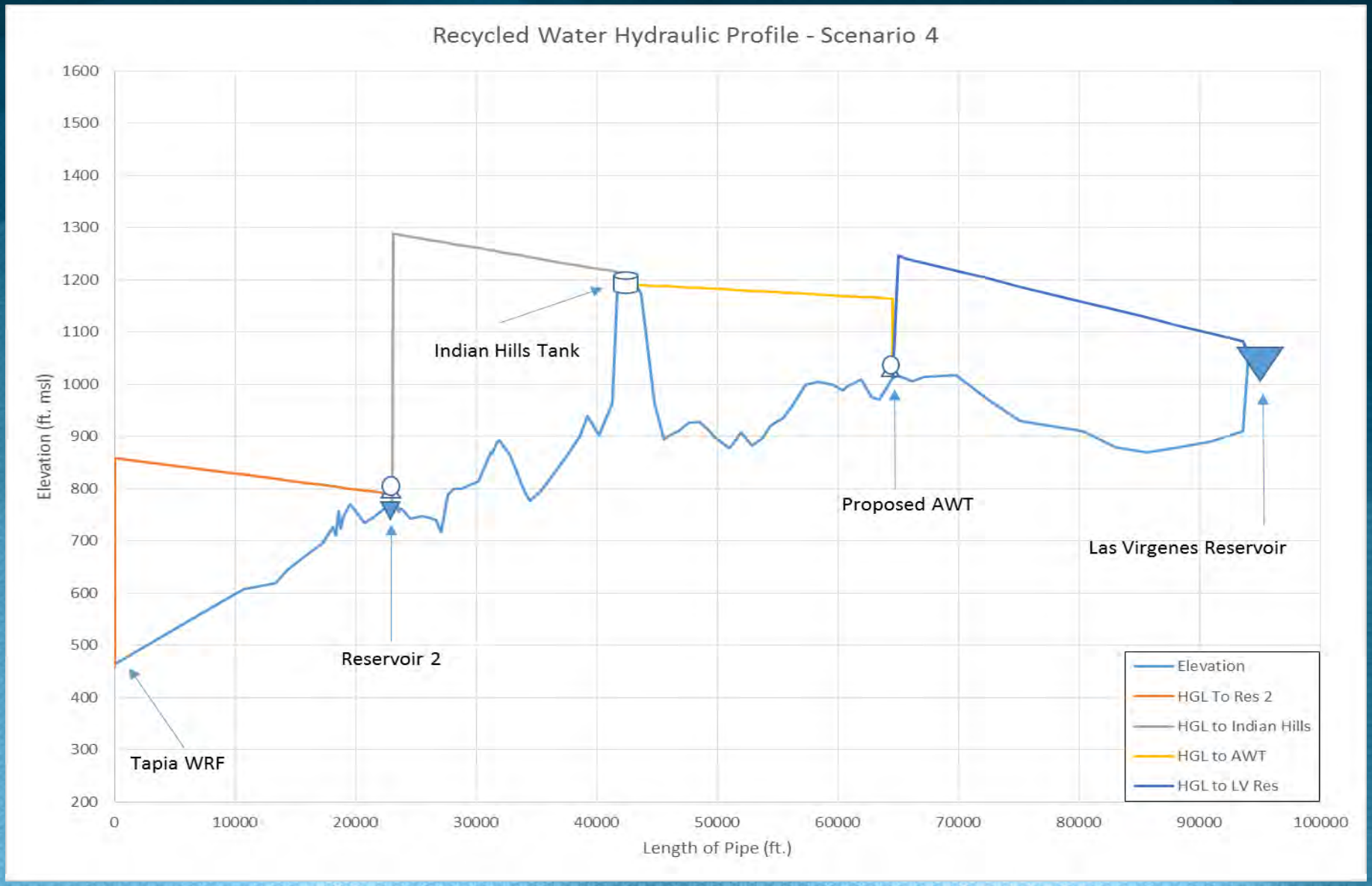
# AWT Considerations

- Spare units ensure continuous operation
- In unlikely event of process upset, AWT would be contained onsite until resolved
- AWT would be connected to sewer for recovery of residuals at Tapia WRF

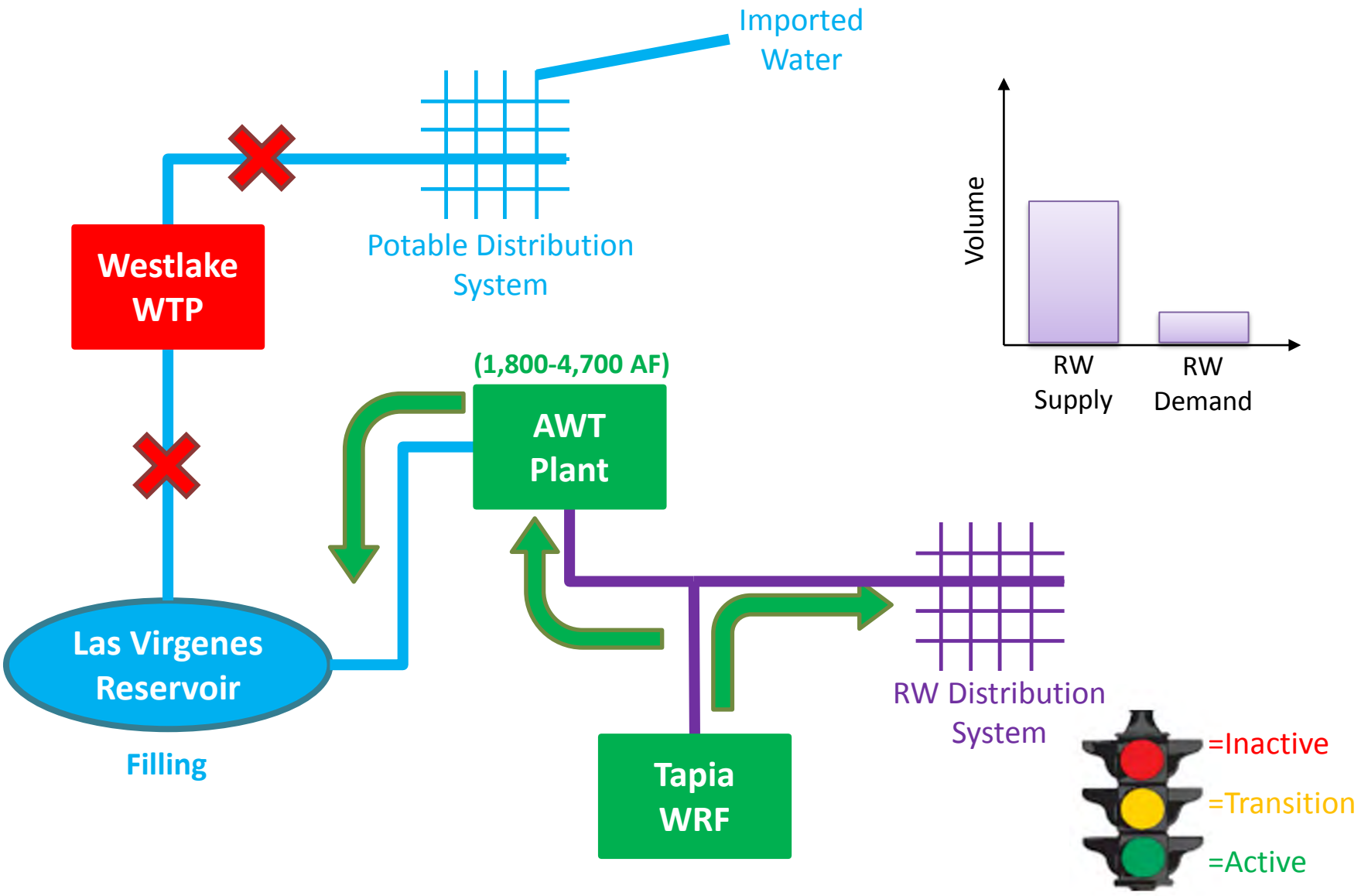
# Emergency Operations

- AWT Plant must shut down for 24 hours before serving water from LV Reservoir.
- Storage in potable system would supply customers until water can be drawn from LV Reservoir.
- AWT can be shut down for up to two days using Reservoir 2.
- For longer shutdowns, AWT may be connected to storm drain system so flows could be diverted.

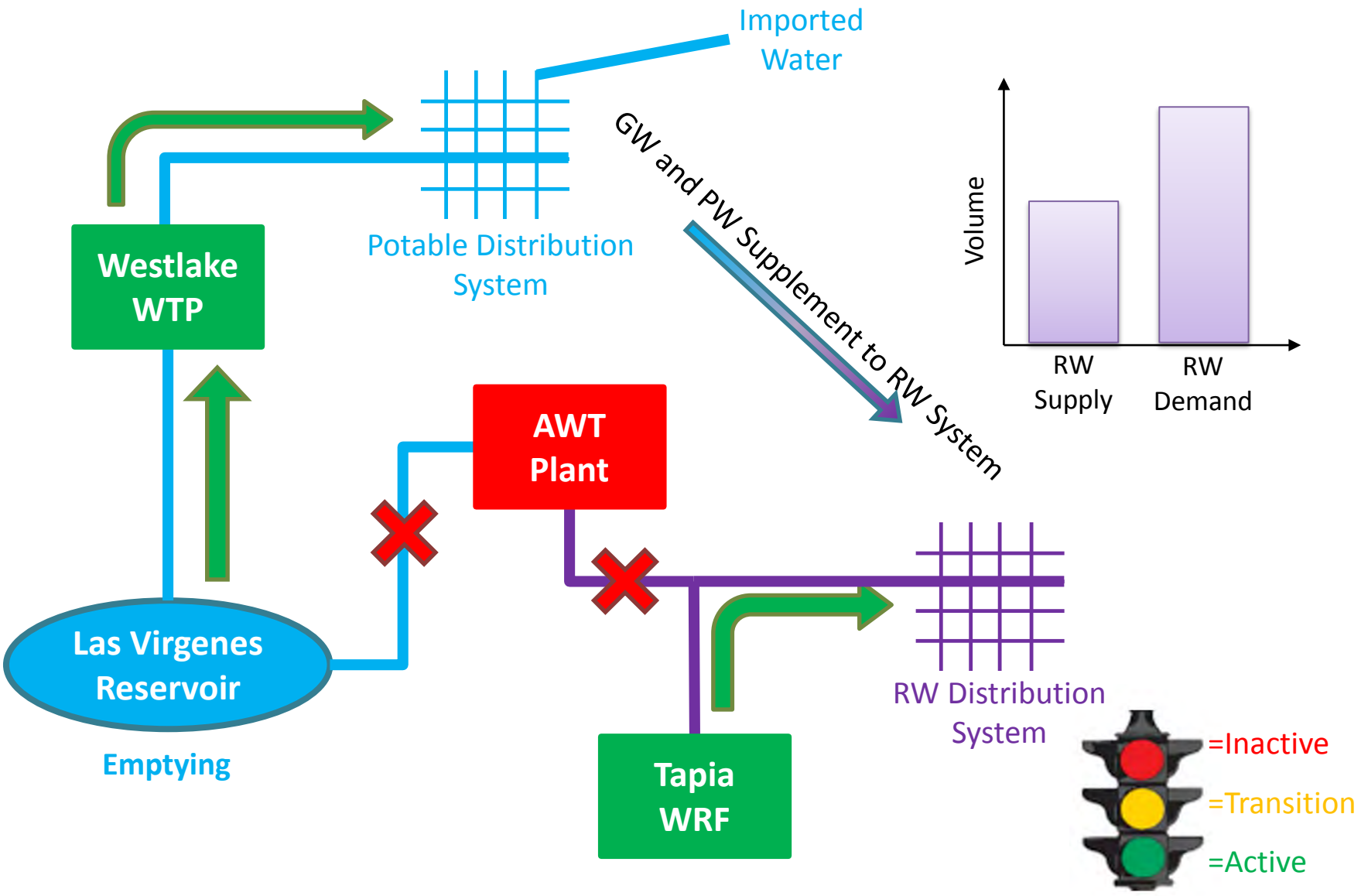
# Pump Stations and Tanks



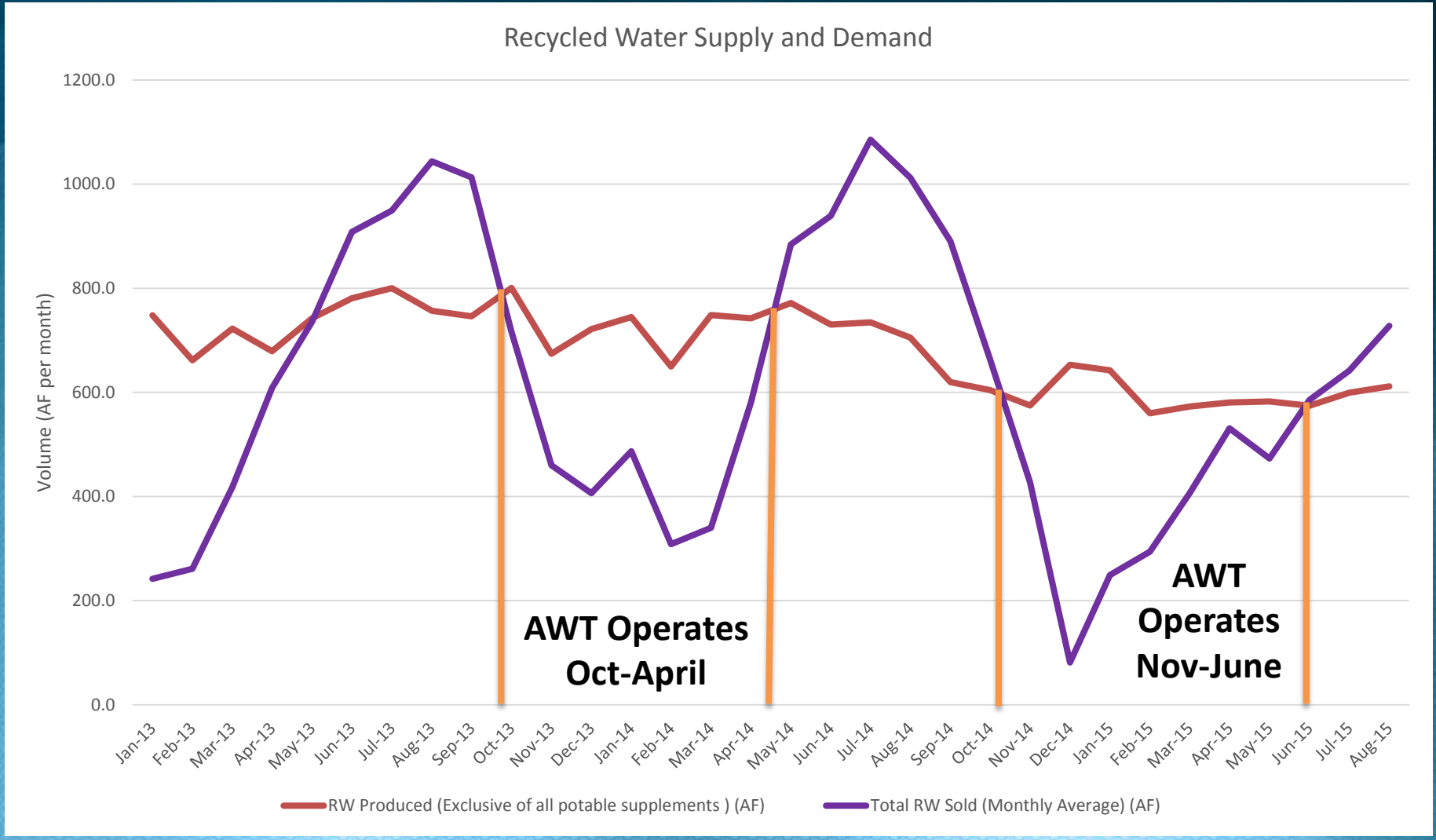
# Seasonal Operation Strategy - Winter



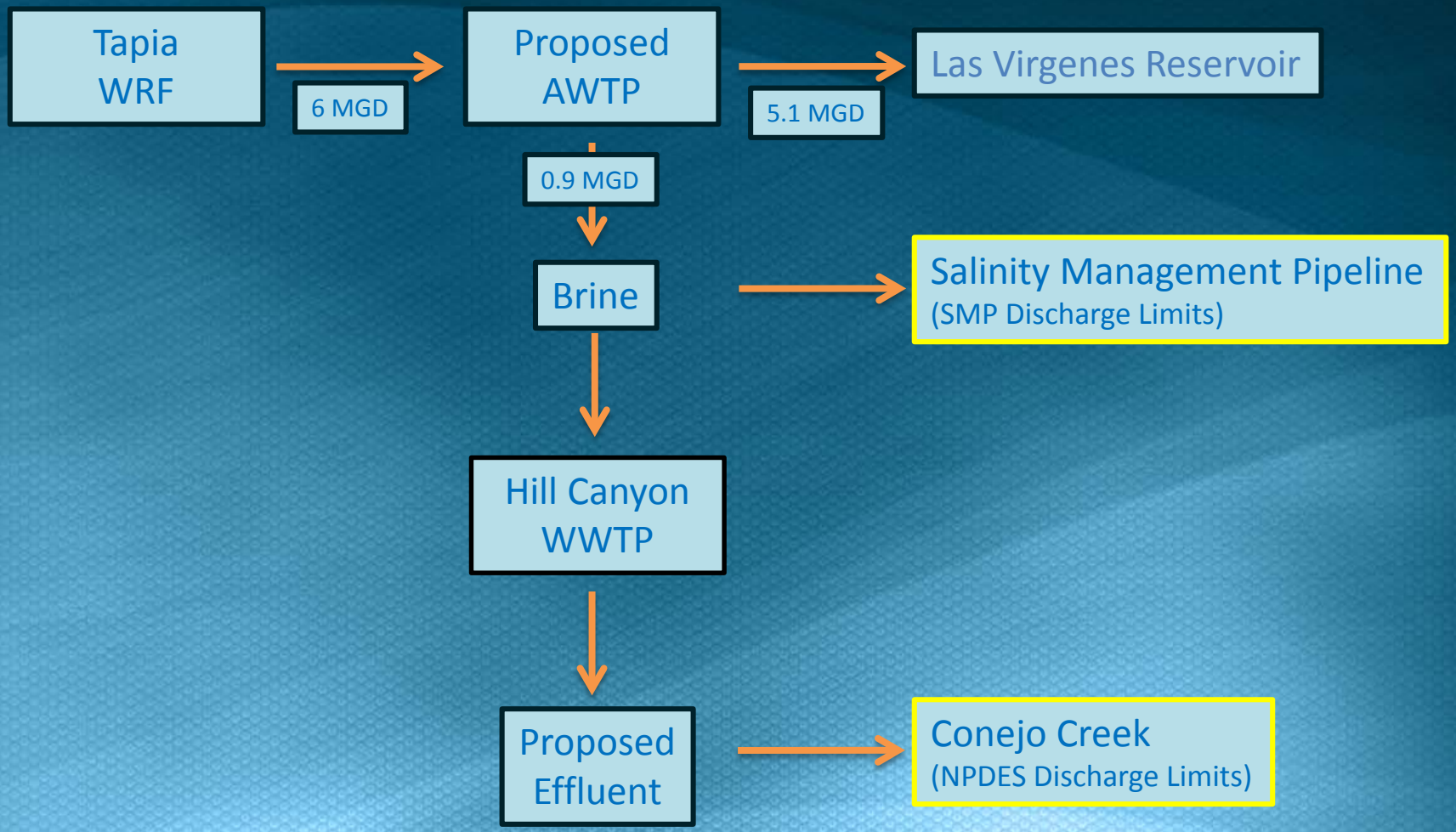
# Seasonal Operation Strategy - Summer



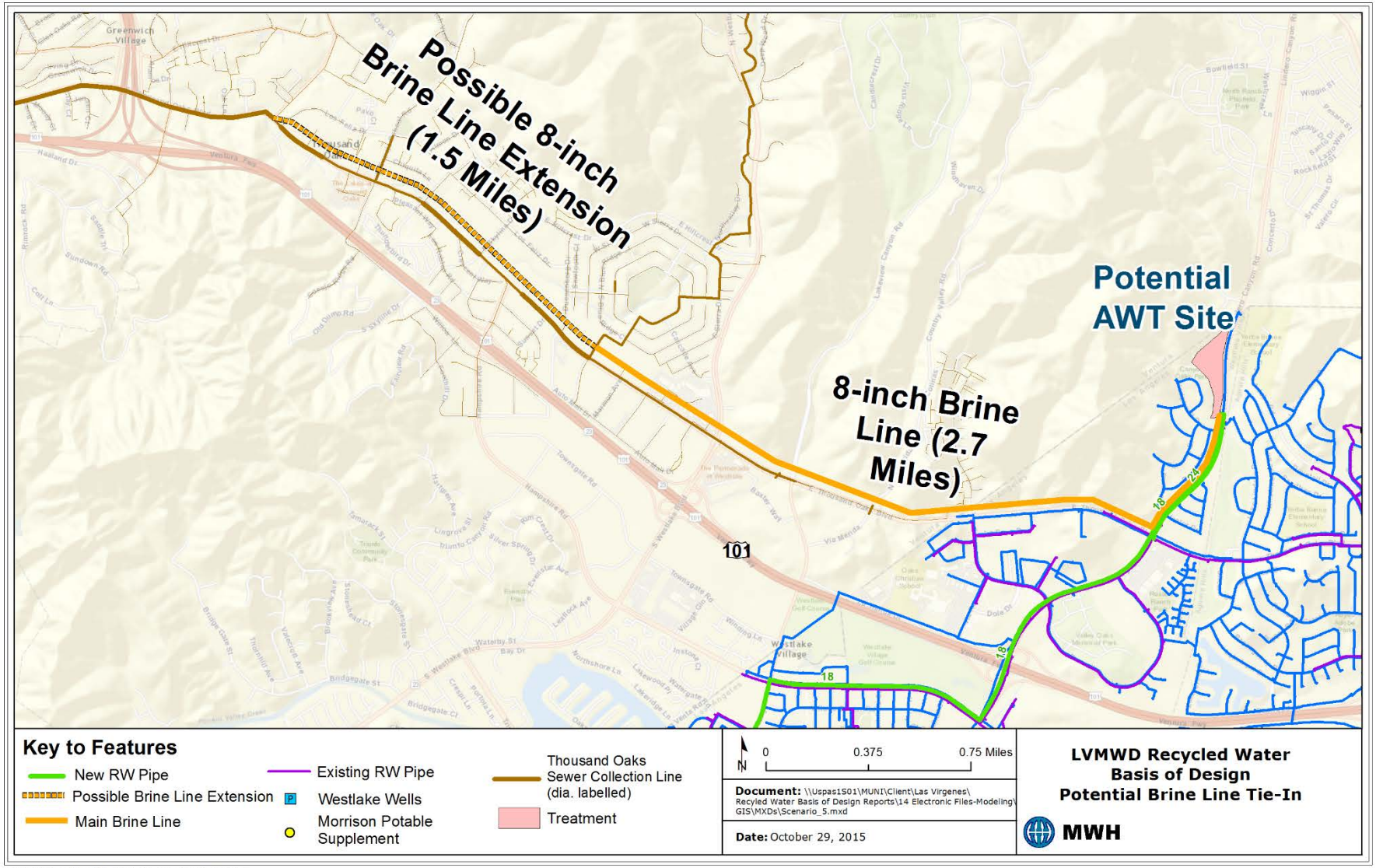
# RECYCLED WATER SUPPLY AND DEMAND



# Brine Flow Diagram



# Brine Line Location



# Brine Disposal Compliance

- AWTP Design Parameters
  - Plant Capacity: 6 MGD
  - RO Recovery: 85%
  - Brine Line Capacity: 0.9 MGD
- **Compliance**
  - SMP Discharge Limits:
    - Brine quality complies with all SMP Discharge limits
  - NPDES Discharge Limits:
    - Proposed Hill Canyon effluent complies with Conejo Creek NPDES Discharge Limits under historical conditions

# Estimated Capital Cost

| Item Number | Description | Estimated Total Cost (In Millions) |
|---|---|---|
| 1 | AWT Plant (6 MGD) | $38 |
| 2 | AWT Inlet Pipeline | $1.1 |
| 3 | AWT Outlet Pipeline | $6.3 |
| 4 | Brine Line | $4.0 |
| 5 | Mixing System | $0.5 |
| | | |
| | **Subtotal** | $50 |
| | **Contingency (25%)** | $13 |
| | **Engineering and Admin (15%)** | $7.5 |
| | **Est. Total Construction Cost** | $71 |

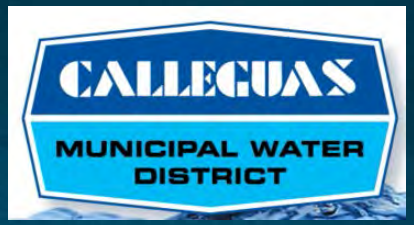
# Estimated O&M Cost
## (Based on 2014 Flows)

| Item Number | Description | Quantity (AF) | Unit Price ($/AF) | Estimated Total Cost (In Thousands) |
|---|---|---|---|---|
| 1 | RWPS West Pump Station | 2,000 | $25 | $50 |
| 2 | AWT | 1,700 | $900 | $1,500 |
| 3 | Mixing System | 9,500 | $25 | $250 |
| 4 | Westlake WTP | 200 | $150 | $30 |
| 5 | Brine Discharge Fee* | 300 | $1,500 | $450 |
| | | | | |
| | **Subtotal** | | | $2,300 |
| | **Contingency (10%)** | | | $230 |
| | **Est. Total O&M Cost** | | $1,500 | $2,500 |
| | | | | |
| | **Imported Water Savings** | 1,700 | $900 | ($1,500) |
| | **Est. Net O&M Cost** | | | $1,000 |

*Based on typical WWTP O&M Costs, to be negotiated with City of Thousand Oaks

# Potential Partners

- Scenario 4
  - City of Thousand Oaks
  - Calleguas Water District
  - Camrosa Water District
  - City of Westlake Village
  - Metropolitan Water District of Southern California
  - State of California

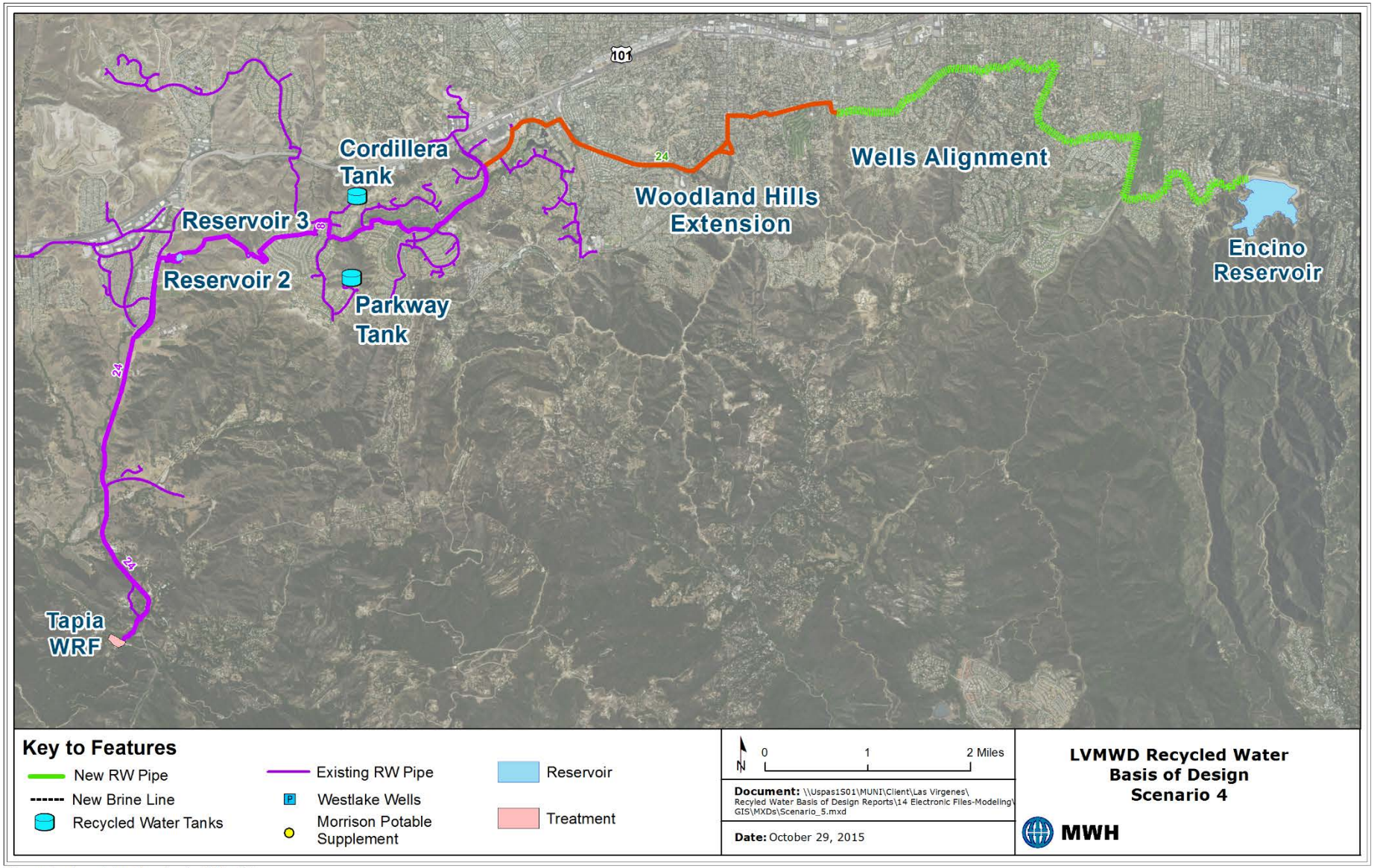







# SCENARIO 5 – RECYCLED WATER STORAGE USING ENCINO RESERVOIR

# SCENARIO 5

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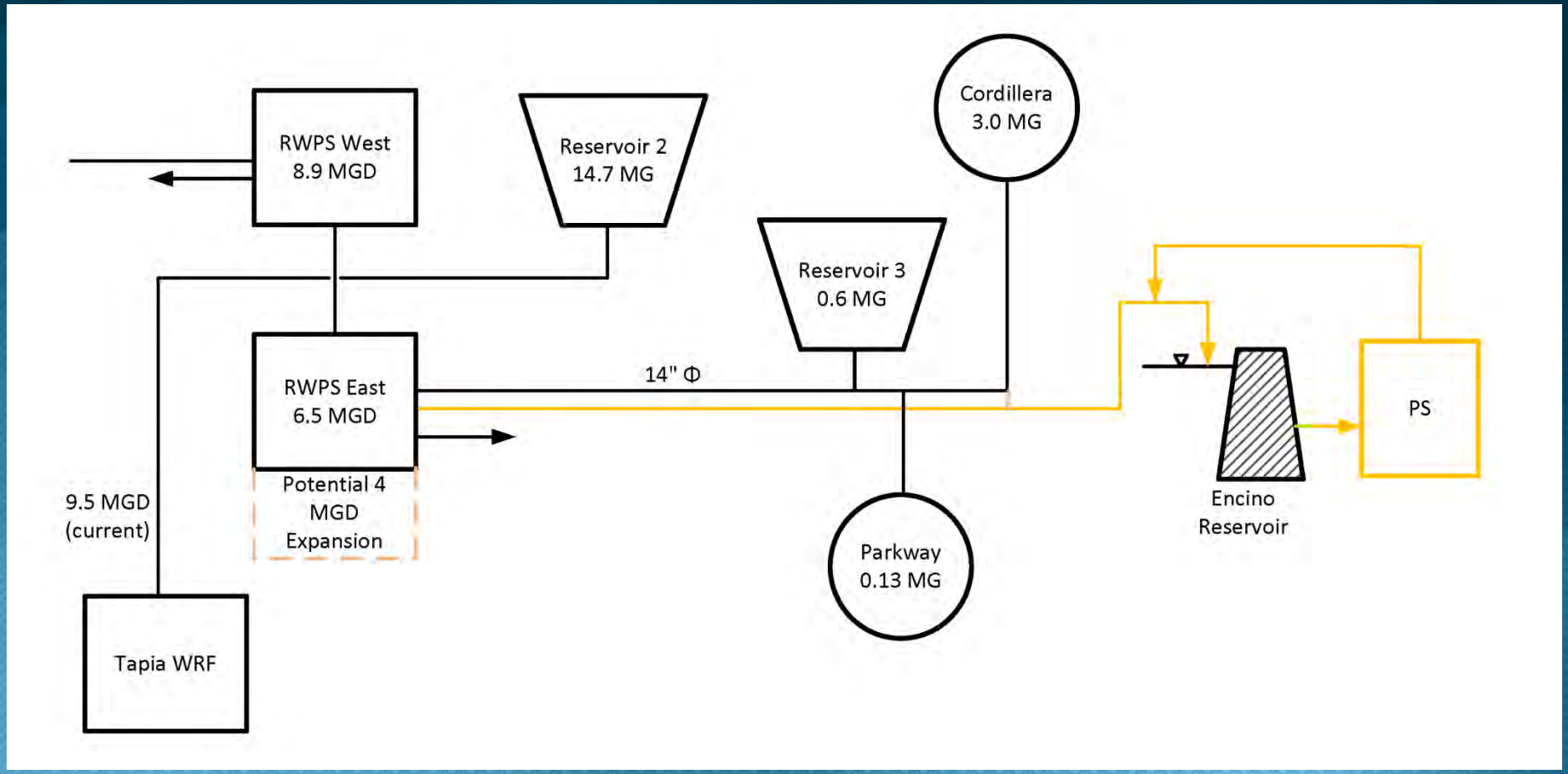
# SCENARIO 5 SCHEMATIC



# Site Physical

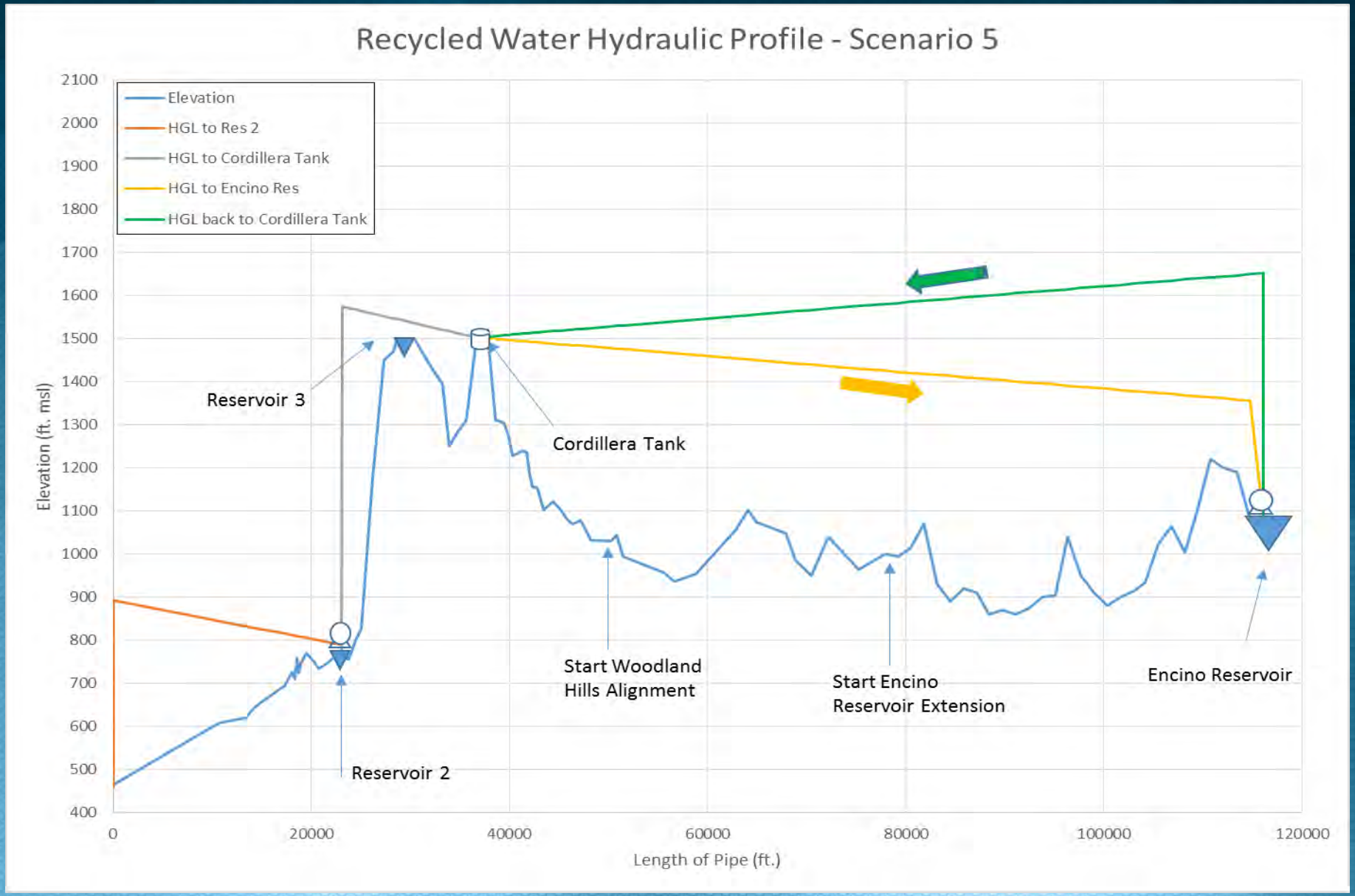
# Encino Reservoir Considerations

- Seismic Study of Dam
- Pump Station Construction (Proximity to Neighborhood)
- Vector Control
- Mixing & Aeration

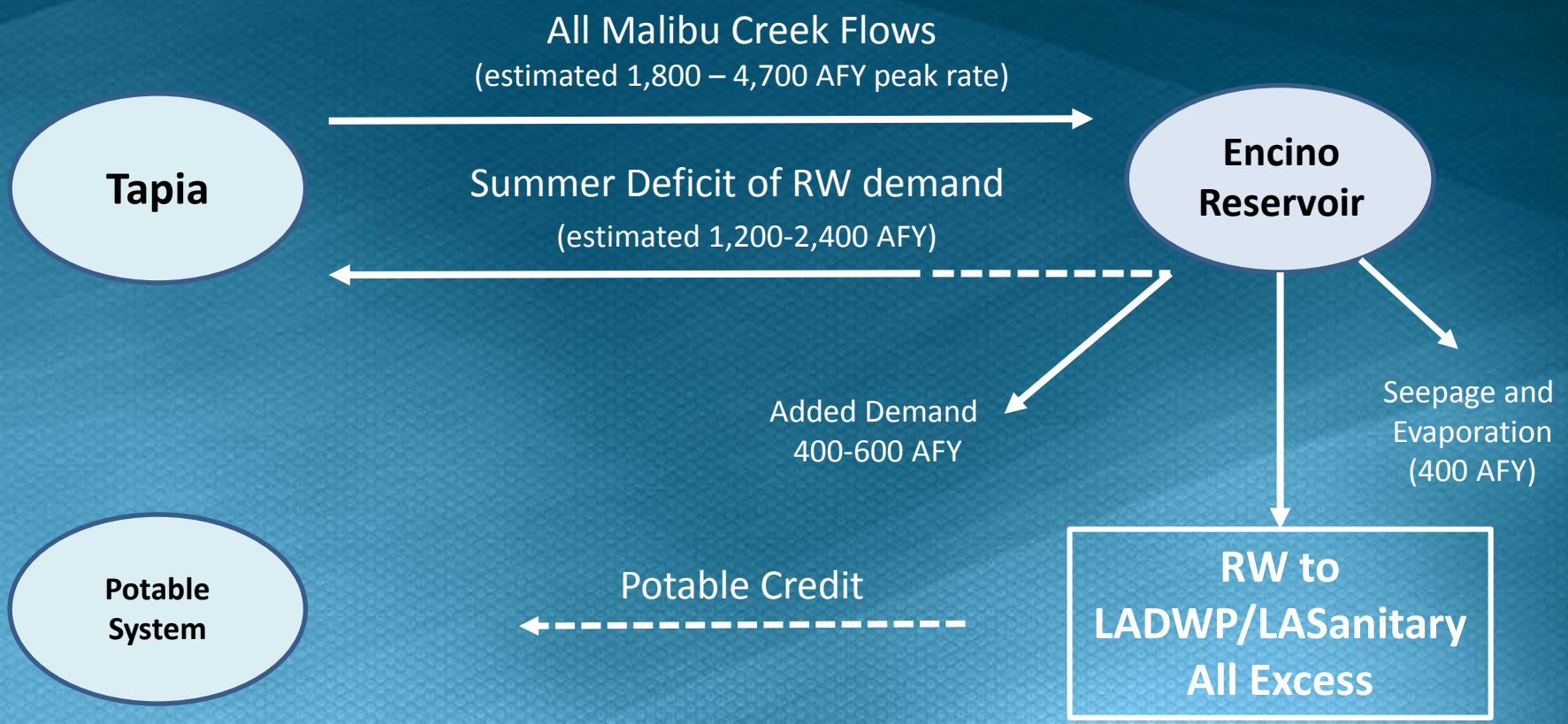
# Emergency Operations

- Emergency Storage
- Reservoir Drain to LA River
- Interim connection to LASanitary Sewers in case of pipe break

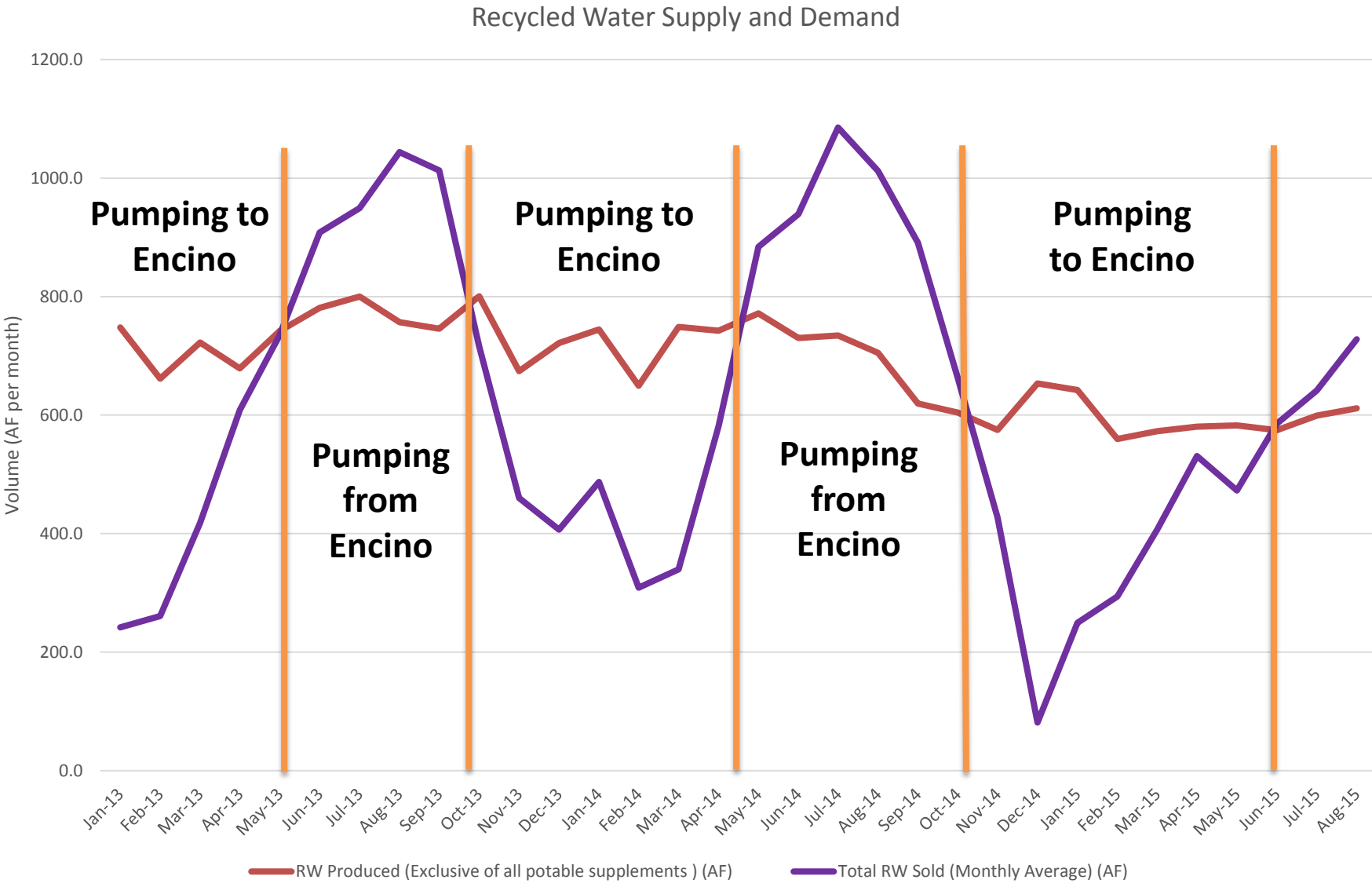
# Pump Stations and Tanks



# Operation Strategy



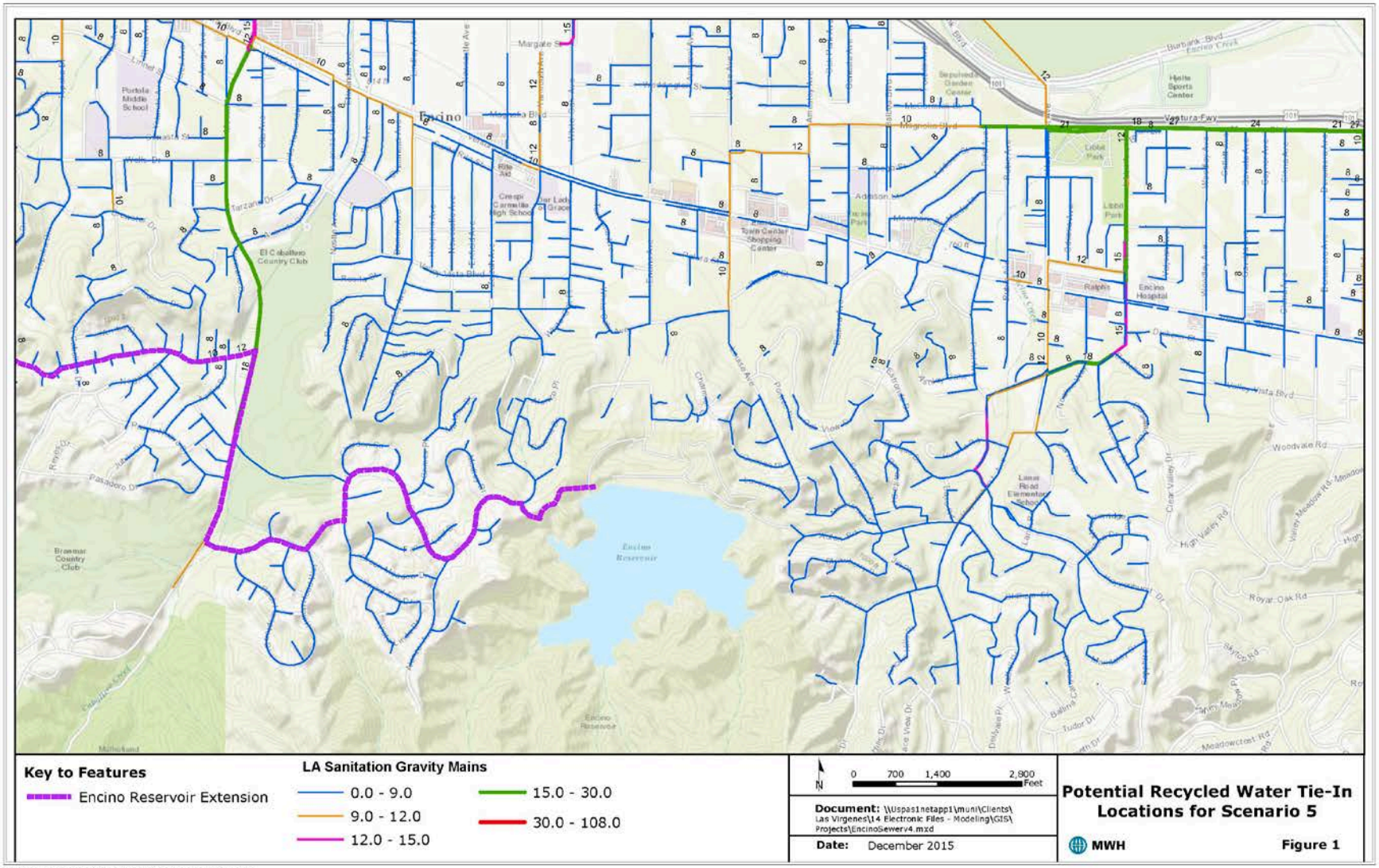
# SEASONAL OPERATION STRATEGY



# Distribution Options

- LASanitation Sewer Connection in Encino
  - Would allow for discharge of RW to Tillman WWTP for retreatment
- LADWP Recycled Water Tie-in
  - Would allow for JPA to send recycled water directly to LADWP distribution system
- Additional RW Customers
  - Country Clubs and golf courses along new alignment that could be served by JPA

# Connection to LASanitation Sewers



# Estimated Capital Cost

| Item Number | Description | Estimated Total Cost (In Millions) |
|---|---|---|
| 1 | RWPS East Pump Station Upgrade | $4.0 |
| 2 | Pipeline | $36 |
| 3 | Pump Station at Encino Reservoir | $10 |
| 4 | Strainers and Chlorination System | $0.5 |
| 5 | Mixing System | $0.5 |
| | | |
| | **Subtotal** | $51 |
| | **Contingency (25%)** | $13 |
| | **Engineering and Admin (15%)** | $7.6 |
| | **Est. Total Construction Cost** | $72 |

# Estimated O&M Cost
## (Based on 2014 Flows)

| Item Number | Description | Quantity (AF) | Unit Price ($/AF) | Estimated Total Cost (In Thousands) |
|---|---|---|---|---|
| 1 | RWPS East Pump Station | 2,000 | $105 | $210 |
| 2 | Treatment | 1,600 | $60 | $100 |
| 3 | Mixing System | 6,000 | $25 | $150 |
| 4 | Encino Pump Station | 1,600 | $70 | $110 |
| | | | | |
| | **Subtotal** | | | $570 |
| | **Contingency (10%)** | | | $57 |
| | **Est. Total O&M Cost** | | | $630 |

# Potential Partners

- Scenario 5
  - LADWP
  - LASanitation
  - Metropolitan Water District of Southern California
  - State of California

Los Angeles LA DWP Department of Water & Power

environment LASANITATION CITY OF LOS ANGELES

THE METROPOLITAN WATER DISTRICT of SOUTHERN CALIFORNIA

THE GREAT SEAL OF THE STATE OF CALIFORNIA

# EXERCISE: EVALUATION CRITERIA

# EVALUATION CRITIERA

1. Lifecycle Cost
2. Environmental Impact
3. Public Acceptance/ Community Impact
4. Water Supply Benefits
5. Regional Partnerships
6. Water Quality
7. System Flexibility
8. Funding Opportunities
9. Regulatory Compliance
10. Emergency Supply
11. Susceptibility to Climate Change
12. Project Schedule
13. Level of Uncertainty
14. Rate Impact


**Low Importance** **High Importance**

# EVALUATION CRITIERA

1. Lifecycle Cost

# EVALUATION CRITIERA

## 2. Environmental Impact

# EVALUATION CRITIERA

## 3. Public Acceptance

# EVALUATION CRITIERA

## 4. Water Supply Benefits

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## 5. Regional Partnerships

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## 6. Water Quality

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## 7. System Flexibility

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## 8. Funding Opportunities

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## 9. Regulatory Compliance

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## 10. Emergency Supply

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## 11. Susceptibility to Climate Change

# EVALUATION CRITIERA

## 12. Project Schedule

# EVALUATION CRITIERA

## 13. Level of Uncertainty

# EVALUATION CRITIERA

## 14. Rate Impact

# NEXT STEPS

# Questions / Comments / Adjourn