Water Management and Conservation Plans

Guidance for Oregon Municipal Water Suppliers

WMCP Workshop
Salem, Oregon, June 5, 2003

Today's Presenters:

- League of Oregon Cities – Willie Tiffany
- Oregon Water Resources Department – Doug Parrow
- City of Salem – Dave Prock and Libby Barg
- Economic and Engineering Services (EES) Inc.:
  - Wade Hathhorn, President
  - Andrew Graham, Project Manager
  - Tim Henkle, Staff Planner

Section I.
Overview of Guidebook

Section II. Requirements Under the Revised Division 86 Rules

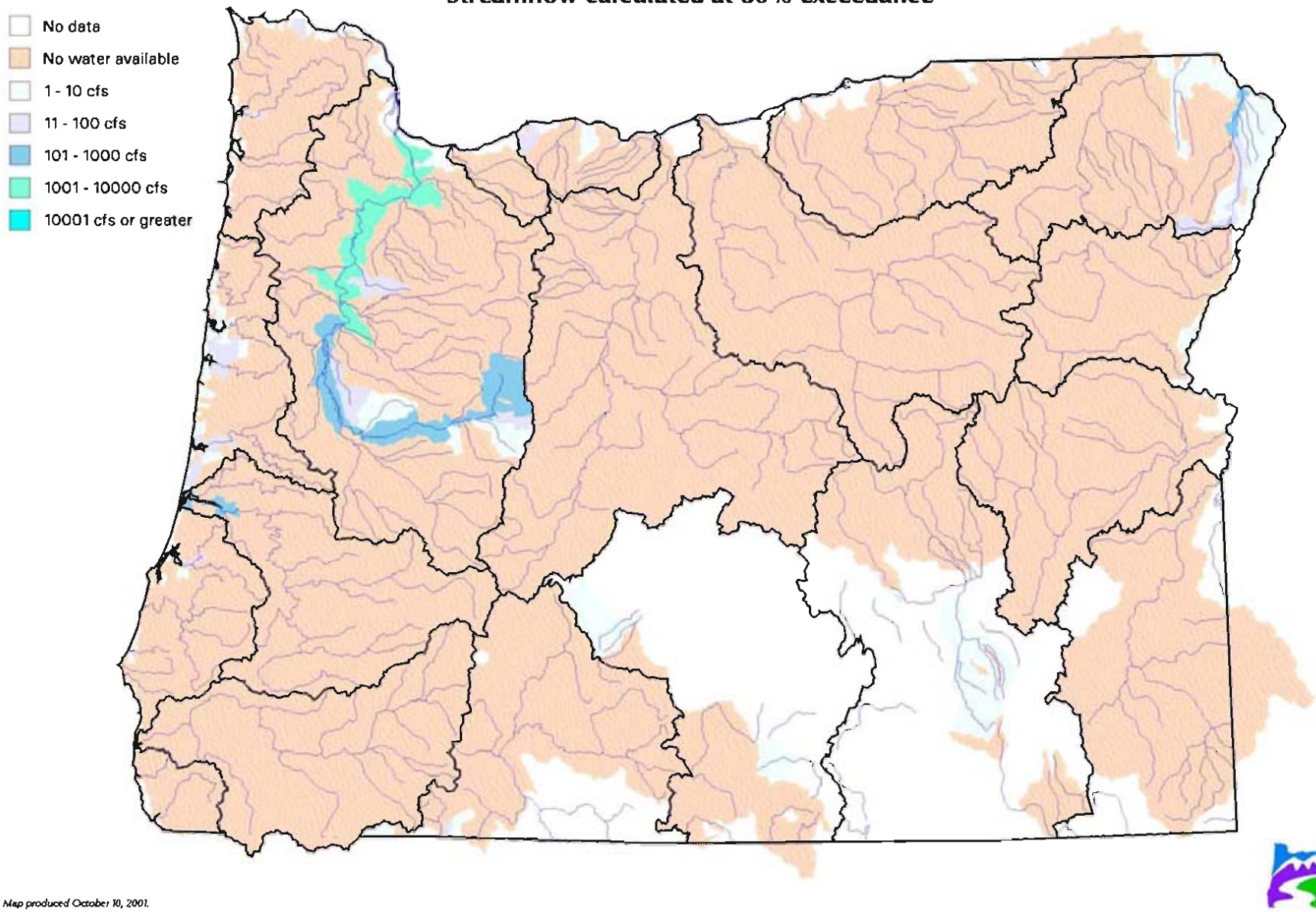
Presented by Doug Parrow,
Water Resources Department

Prior Appropriations Doctrine

- System for allocation of scarce resource
  - Evolved from mining law
  - First in time, first in right
- Most streams are fully allocated
  - Many by 1900
  - Little water is available
  - ≈ 8,000 regulatory actions per year
- Municipal supply plans
  - New rights not reliable sources
  - Alternatives needed

AUGUST AVAILABLE STREAMFLOW

Streamflow calculated at 80% exceedance



Map produced October 10, 2001.

Permit Extensions

- Permit extensions
  - Requests for more time to “prove up” on permits
  - Approved for “good cause shown”
- Review of extension process
  - Change from “5 years” to “time needed”
  - Consideration of additional factors for “good cause”
  - Recognition of unique character of municipal rights

Permit Extensions

- Revised extension rules
  - Assessment of need shifted to planning process
  - Authorized quantity of diversions frozen
  - WMCP required within 3 years
  - Exceptions for small communities, short extensions

Water Management and Conservation Plans

- Systematic evaluation of water supply options
  - Conservation must be considered
- Communities determine appropriate options
  - Except for required conservation measures
  - However, all measures allow flexibility in implementation

Water Management and Conservation Plans

- Justify increased diversions under extended permits
  - Based on 20-year water need
  - Approval of plan “unfreezes” quantity of diversions
  - New maximum diversion specified in approval
- Plan update schedule
  - ≈ 10 years, or sooner if more water needed

“Quick Summary” of Division 86 Rules

Presented by Tim Henkle, EES, Inc.

What is a WMCP?

- A description of the supplier's use, management, and conservation of water resources
- Documentation of past and current activities
- A plan for the future

Rules Governing WMCPs

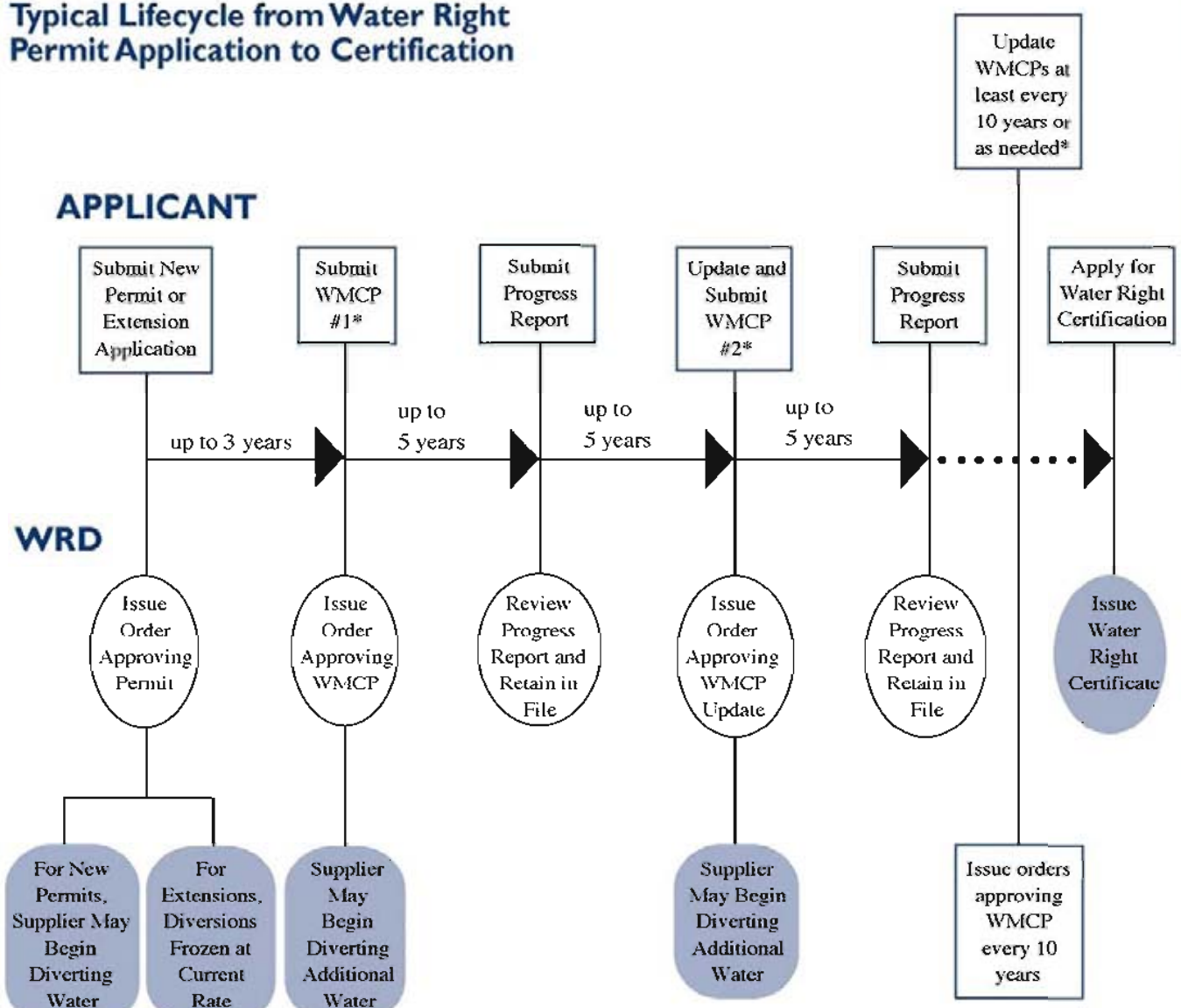
- Legal authority: WMCP guidelines are based on Oregon Administrative Rules (OAR) 690-315 and 690-086 (“Division 86”)
- OAR 690-315 gives WRD authority to require WMCPs
- OAR 690-086 details the requirements for WMCPs
- WRD has responsibility to require WMCPs and approve WMCPs based on OAR criteria

Who Must Submit a WMCP?

- Almost all water suppliers who request water right extensions and new water rights
- Exception in OAR: Suppliers which serve less than 1,000 population
- However, WRD has the discretion to require suppliers with less than 1,000 to submit WMCPs

Exhibit 2.1

Typical Lifecycle from Water Right Permit Application to Certification



Four Major Elements of a WMCP

1. Water Supplier Element
   - Description of the supplier and water system:
     - Source(s) of water
     - Service area
     - System schematic
     - Current and future population
     - Adequacy/reliability of supply
     - List of water rights
     - Demand quantified (ADD, MDD, annual average)
     - Customers served by customer class, if applicable
     - Interconnections
     - System leakage quantified

Four Major Elements of a WMCP

2. Water Conservation Element
   - Description of past, current, and future conservation measures
   - Some future measures required of all suppliers to be implemented
   - Some future measures required of some suppliers to be addressed
   - Benchmarks for each measure
   - Progress reports

Conservation Element

Measures Required of <u>All</u> Suppliers:

- ✓ Full metering
- ✓ Meter testing/maint.
- ✓ Annual water audit
- ✓ Rate structure based on metered quantity
- ✓ Public Education

"Additional" Measures

- Leak detection
- Rate structures that encourage consv'tn.
- Technical/financial assistance
- Retrofit/replacement
- Water reuse/recycling

Who Must Address Additional Conservation Measures?

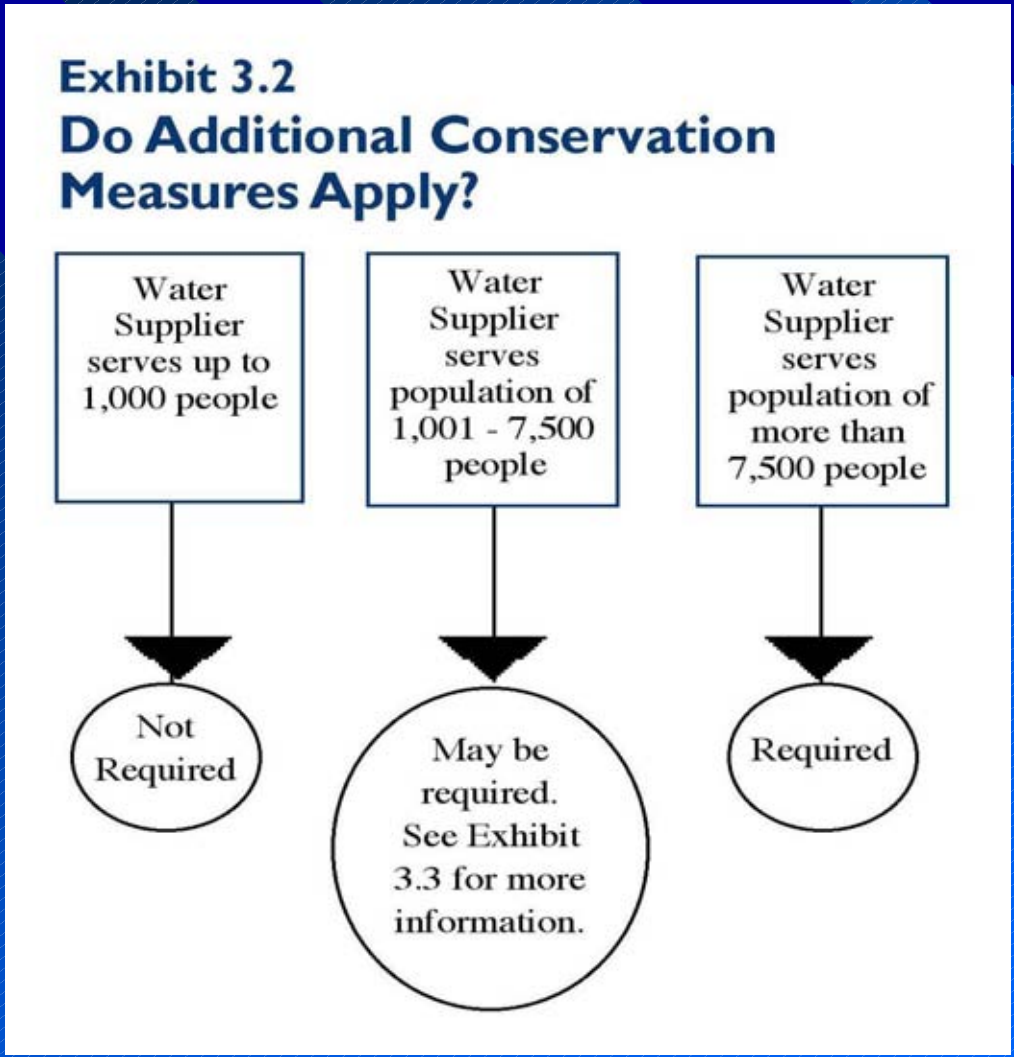
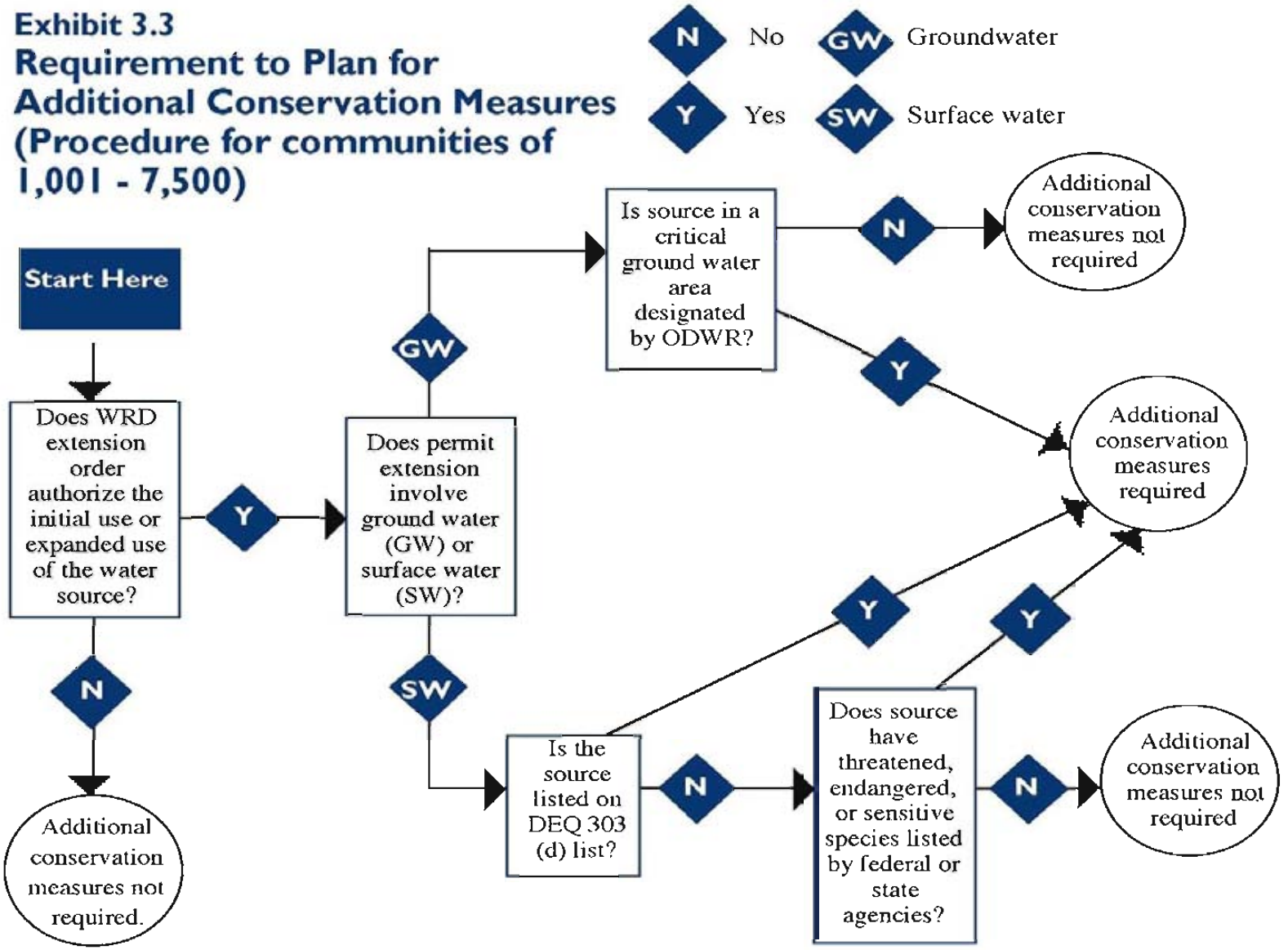


Exhibit 3.3
Requirement to Plan for Additional Conservation Measures (Procedure for communities of 1,001 - 7,500)



Four Major Elements of a WMCP

3. Water Curtailment Element
   - Assesses the ability of the supplier to maintain delivery during a long-term shortage
   - Description of water curtailment activities in the event of a water supply shortage
   - Curtailment plan may contain conservation measures, but is not a replacement for a conservation plan

Four Major Elements of a WMCP

4. Water Supply Element
   - Provides rationale for future water supply needs
   - Compares supply needs to available supply (existing or future) less any savings from conservation measures

Section III.
Guidance for Developing a Water Management and Conservation Plan

Organizing and Assembling Information

Presented by Wade Hathhorn, EES, Inc.

Getting Organized

- Establish Plan Objectives
  - Meet State requirements
  - Reduce exposure
  - Manage resource
- Early Discussion with WRD staff
  - Identify key issues
  - Establish potential needs

Getting Organized (cont'd)

- Assembling Information
  - Refer to Exhibit 3.1
  - Link with Master Plan
- Develop Plan Outline
  - Refer to Appendix E

Tools and Resources

- **State and National:**
  - Water Resources Department
    - **www.wrd.state.or.us**
    - **Online plan**
  - AWWA
    - **www.awwa.org**
    - **Water Wiser**
    - **Conservation Tips**
  - WEF
    - **www.wef.org**
    - **Reuse options**
- **Local Assistance**
  - PNWS-AWWA
    - **www.pnws-awwa.org**
    - **Outreach assistance**
    - **Publications**
    - **Conservation Committee**
  - Local Council of Governments
  - PNPCA
    - **www.pnpca.org**
    - **Reuse committee**

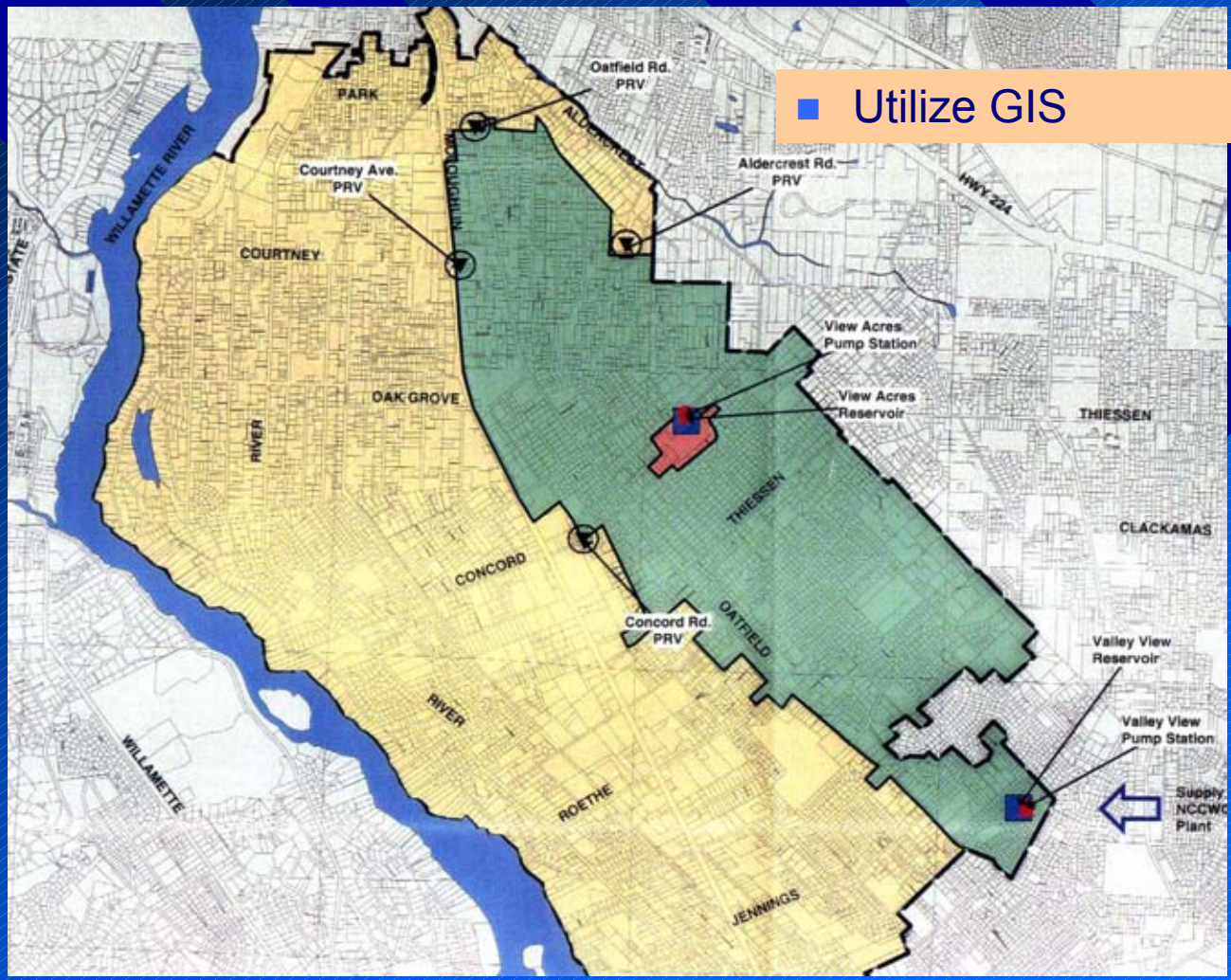
Water Supplier Description

- Delineation of current service area
- Description of sources
- Summarize water rights held
- Assess adequacy of existing supplies
- Describe customers served and use
  - Quantify present and historic use

Water Supplier Description (cont'd)

- Quantify system leakage
- Identify interconnections
- System schematic
  - Existing and planned service area
  - Treatment facilities
  - Storage reservoirs and tanks
  - Major transmission and pumping facilities

Water Supplier Description (cont'd)



- Utilize GIS

Projecting Demand, Assessing Supply and Bringing It All Together

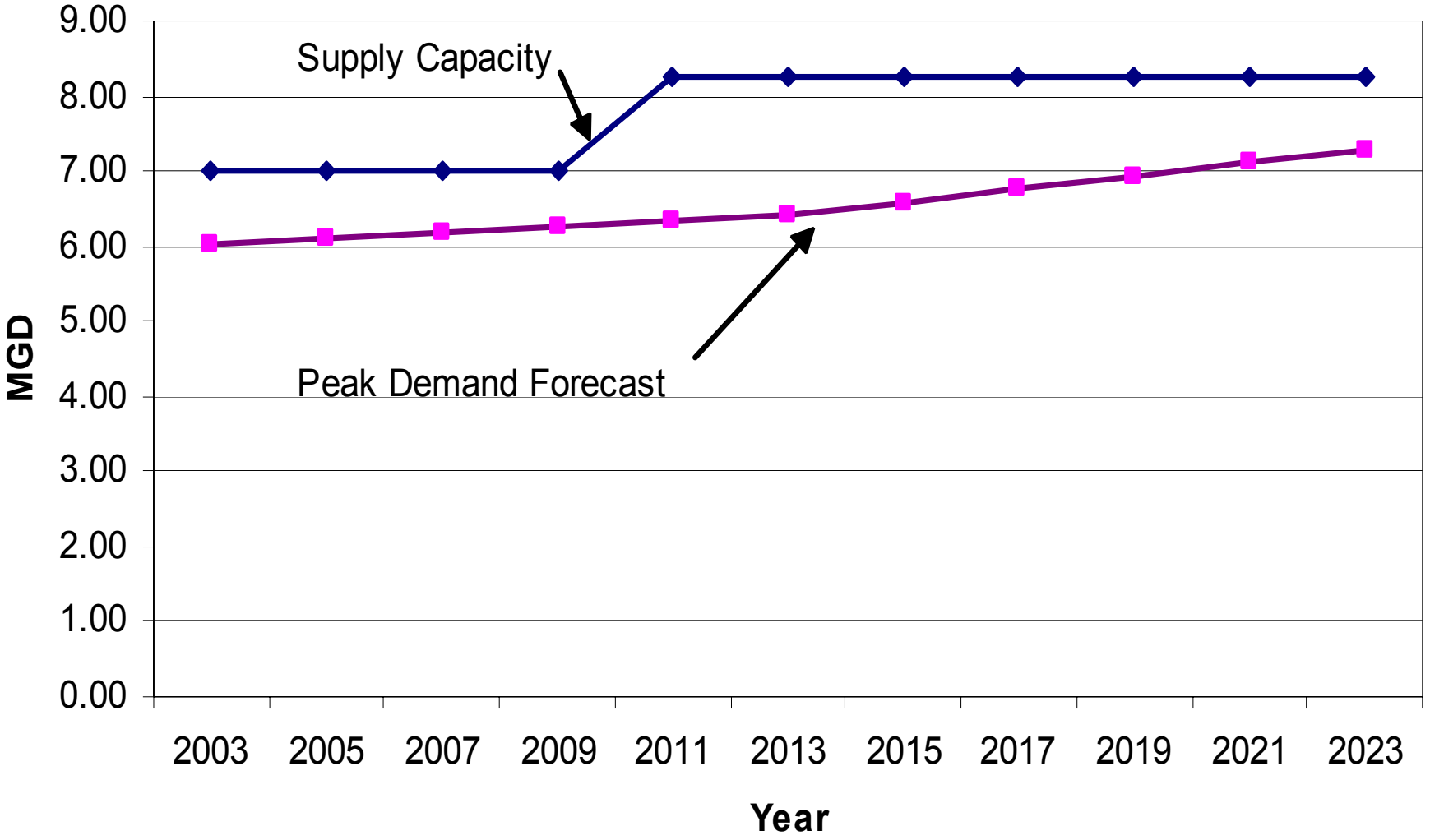
Water Supply Plan

- Delineate current and future service areas
  - Consistent with “land use laws”
  - Relationship to other boundaries
- Assess population projections
  - Municipal planning
  - County planning
  - PSU projections

Water Supply Plan (cont'd)

- Prepare demand forecast
  - Per capita estimate
  - Disaggregated forecast
  - Advanced modeling
  - Projections at 10 and 20 years (or longer)

Comparison of Supply and Demand to 2023
"Cedar City" Sample Plan



Water Supply Plan (cont'd)

Figure 5-1
40-Year Population Forecast

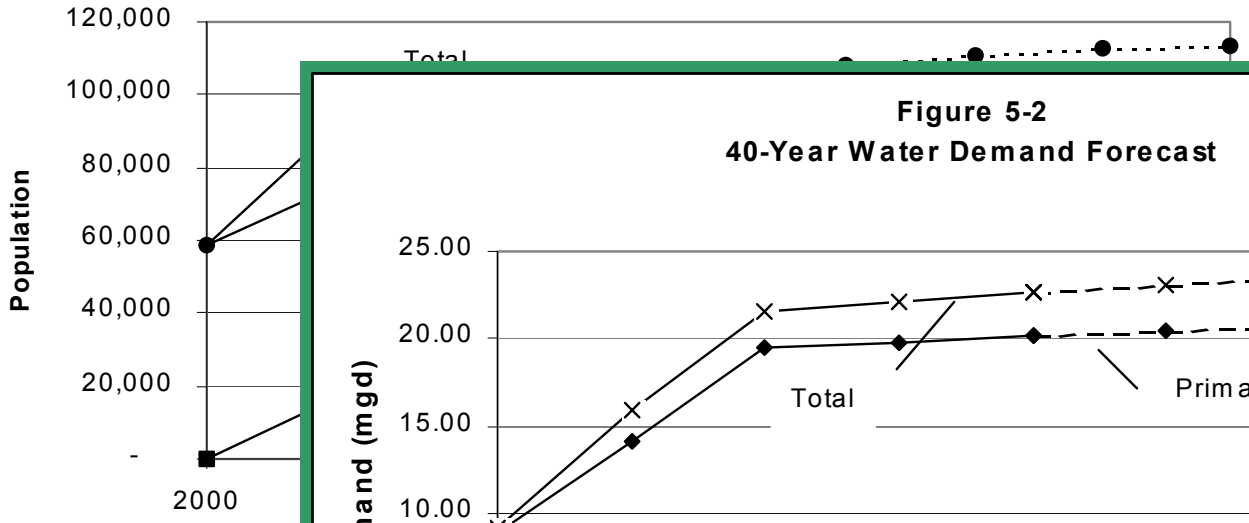
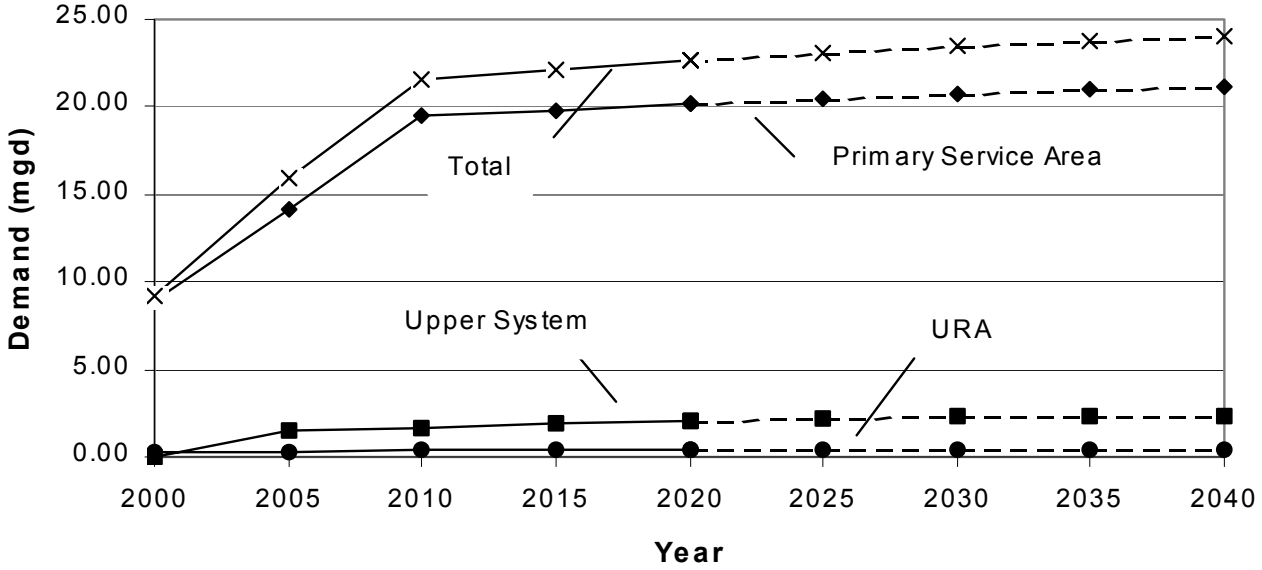


Figure 5-2
40-Year Water Demand Forecast

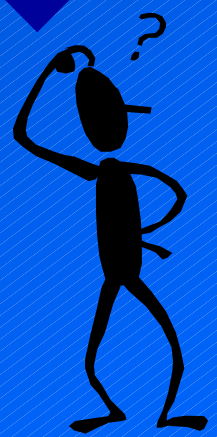


Water Supply Plan (cont'd)

- Assess needs
  - Compare sources (capacities) and demand
  - Outline deficiencies
  - Analyze alternative sources
    - If expansion or initial diversion of water allocated under existing permits is necessary or if new rights will be required within the next 20 years:
      - Address availability, reliability, and feasibility of proposed sources
      - Address likely environmental impacts

Water Supply Plan (cont'd)

- Must also consider:
  - Conservation measures under OAR 690-086-150
  - Interconnections with other agencies
  - Any conservation measure that would provide water at a comparable cost



Water Supply Plan (cont'd)

- Prepare schedule to fully exercise permits
  - Consistent with extension requests
  - Advantage to certify as soon as practical

Table 5-7
City of Gales Rock
Water Rights Perfection Schedule

Permit No.	Priority Date	Certificate	Rate (cfs)	Use	Perfection Schedule	Notes
G-1001	8/19/1923	C-1234	1.33	Municipal	Complete	Wells 1 and 2
G-1020	4/26/1956	-	0.55	Municipal	Summer 2010	Well 3
G-1030	9/16/1972	-	0.67	Municipal	Summer 2010	Well 4
G-1040	10/09/1981	-	1.21	Municipal	Summer 2010	Wells 5 and 6
G-1010	6/14/1931	C-0123	0.33	Irrigation	Complete	Well 7

Water Supply Plan (cont'd)

- Quantification of maximum rate and monthly volume

20-Year Withdrawal Summary

Permit No.	Permitted Capacity		20-Year Peak Withdrawal		Notes
	Max. Rate (cfs)	Monthly Volume (MG)	Max. Rate (cfs)	Monthly Volume (MG)	
G-1001	1.33	25,786,000	0.66	10,664,000	Wells 1 and 2
G-1020	0.55	10,663,000	0.54	8,725,000	Well 3
G-1030	0.67	12,990,000	0.50	8,143,000	Well 4
G-1040	1.21	23,460,000	0.61	9,888,000	Well 5 and 6
G-1010	0.33	6,398,000	0.20	3,878,000	Well 7

Water Supply Plan (cont'd)

- Address mitigation under state and federal law
  - ESA, CWA, SDWA, and others

Developing the Water Conservation Element

Presented by Andrew Graham, EES, Inc.

The Conservation Element

Measures Required of All Suppliers:

- ✓ Full metering
- ✓ Meter testing/maint.
- ✓ Annual water audit
- ✓ Rate structure based on metered quantity
- ✓ Public Education

"Additional" Measures

- Leak detection
- Rate structures that encourage consv'tn.
- Technical/financial assistance
- Retrofit/replacement
- Water reuse/recycling

If “Additional” Measures Apply, What does Supplier Have to Do?

Consider each measure and provide documentation to show how it was evaluated:

- May conclude the measure is effective and appropriate; *or*
- May conclude the measure is “neither feasible nor appropriate.” In this case, explain and provide information to back up this finding.

✓ Metering

- All systems must be fully metered – sources and customers;
- If not fully metered, provide 5-year plan to install meters.
- Document meter testing and maintenance program
- What about wholesale customers?

✓ Water Audit

- Annual tracking of unmetered authorized and unauthorized uses
- $Q_{produced} = Use_{metered} + Use_{unmetered} + Losses$
- Information Sources:
  - Production records
  - Sales records
  - Estimates of authorized unmetered uses
  - Information on known major leaks
  - Information on meter calibration and age

Leak Detection

- If audit shows leakage > 10%, must implement leak detection
- Leak Detection Must:
  - Be regularly scheduled and systematic
  - Cover distribution and transmission system
  - Use methods appropriate to supplier's size and capabilities
- Document each of these in WMCP
- Note: Many suppliers use specialized contractors for leak detection

Leak Repair or Line Replacement

- Must implement if:
  - "Additional measures" apply and leakage > 15%; or
  - Initiating or expanding use of water and "resource issues" apply
- Document program and decision-making
- Can take cost into account, if provide adequate documentation
- Other practical considerations may apply

✓ Rate Structure

- Basic Requirement:

Rates must be based (in part) on quantity used by the customer

  - Any kind of commodity rate applies

Rates & Billing – More Advanced Requirement

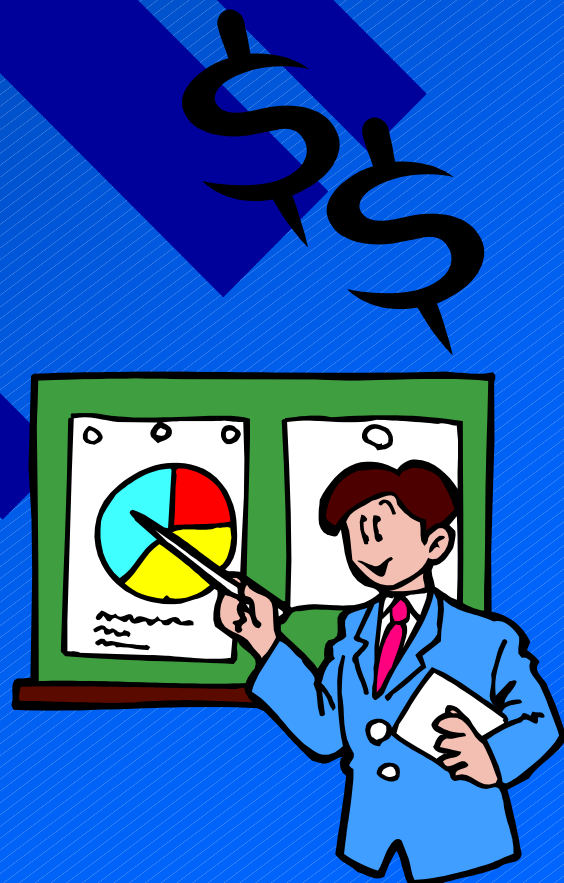
- If “additional measures” apply, rates must “encourage” conservation
- For example:
  - Inverted block structure; or rates higher in summer months
  - Monthly or bimonthly billing (not quarterly)
  - Consumption data provided with bill (if billing system permits)
  - Cost savings information provided with bill

✓ Public Education

- Public education required of all suppliers, but specific content may vary
- Examples:
  - Brochures, bill inserts
  - Newspaper articles, radio
  - School programs
  - Decals, bumper stickers, eye-catching displays
  - Demonstration garden at city park or district office
- Provide documentation and explain why this fits community and supplier

Technical and Financial Assistance to Customers

- Examples:
  - Customer water audits (outdoor or indoor)
  - Rebates and cost-share programs
  - Provide training opportunities for customers or maintenance staff
  - Partnerships with home centers, garden centers, etc.
  - Parks, golf courses



Retrofit/Replacement

- Examples:
  - Home conservation kits
  - Toilet replacement or retrofit program
  - Cooling equipment (HVAC) and ice machines program
  - Process-specific equipment in Industrial, Commercial, Institutional (ICI) sector

Reuse/Recycling/Non-potable

- Municipal wastewater – on site use or dual piping to deliver to selected customers
- Private sector – in plant recycling
- Only required where cost-effective and consistent with community needs and market conditions

Evaluation Techniques

- Cost effectiveness criteria
- Comparison with cost of water supplies (capital cost + O&M cost)
- Peak savings vs. annual savings
- Relationship to sources of supply
- Tradeoffs between different measures
- What can the supplier commit to implementing

Benchmarks

- A benchmark is
  - An action a water supplier commits to doing
  - A schedule for carrying out water conservation measures between the time a WMCP is submitted to WRD and the next progress report or WMCP update
- Each conservation measure must have a benchmark

Examples of Benchmarks

Benchmark	Start Date	Frequency
Source meter calibration (Johnson Springs)	January 2005	Every 5 years
Amend Blue Falls wholesale supply contract to require customer meters	2011	N/A
Develop a web page for water conservation on the City's web site	December 2003	On-going

Developing the Water Curtailment Element

Water Curtailment Element

- A list of three or more stages of alert ranging from mild through critical
- A list of “triggers” for each stage
  - Supply: well or reservoir level
  - Demand: reaches critical level for period of time
  - Capacity: use exceeds percentage of capacity
- A list of actions within each stage to curtail use

Water Curtailment Element (cont.)

Example Curtailment Plan

Stage	Trigger	Goal	Implementation Measures
Mild	Use reaches 80% of capacity	Awareness and 5% reduction in consumption	■ Activate curtailment plan ■ Disseminate informational brochures on conservation methods ■ Put up posters and sandwich boards about the City ■ Coordinate outreach to customers through direct means (web page) and indirect means (media) ■ Voluntary irrigation schedule based on north and south side customers irrigating every fifth day during the early morning or evening. ■ Flush lines for essential needs only ■ Turn off city fountains and post a sign describing why

Mild Stage

Water Curtailment Element (cont.)

Example Curtailment Plan

Stage	Trigger	Goal	Implementation Measures
Moderate	Use reaches 90% of capacity	10% reduction in consumption	■ Continue with "Mild" stage measures except where noted below ■ Irrigation schedule implemented in "Mild" stage mandatory ■ Close all pools, eliminate city street cleaning, line flushing (unless health of customers at risk), and city park irrigation ■ Request businesses reduce consumption by 10% ■ Hosing of pavement not permitted except when necessary for public health or safety

Moderate Stage

Water Curtailment Element (cont.)

Example Curtailment Plan

Stage	Trigger	Goal	Implementation Measures
Critical	Use reaches 95% of capacity	15% reduction in consumption	■ Continue with "Moderate" stage measures except where noted below ■ No use of city supplied water to fill private swimming pools ■ Outdoor irrigation banned ■ No use of city supplied water to wash vehicles

Critical Stage

“Observations from a Municipal Supplier Who’s Been There”

Presented by Dave Prock and Libby Barg,
City of Salem

“Open Discussion”

Section IV.
WRD Review of Water Management and Conservation Plans

WRD Plan Review

- Preliminary review
  - Public notification of plan submittal
  - Public comment within 30 days
  - WRD review within 90 days
  - Supplier has at least 60 days to respond
- Review criteria
  - All required information included
  - Demonstrated need for water given projected growth
  - Reasonable conservation with 5-year benchmarks
  - Resource issues accurately identified
  - “Least-cost” resources to be developed

WRD Plan Review (continued)

- Final plan submitted
  - WRD final review
  - Approval order with findings and quantification of allowable diversions
  - Work plan, if needed
  - Update and progress report schedule
- Appeals of WRD decision
  - Supplier or commenter may appeal to Water Resources Commission
  - Supplier may request appointment of 5-member review board

Progress Reports

- Progress reports due every 5 years
  - List of the benchmarks and implementation progress
  - Average monthly and daily diversions
  - Results of annual water audits
  - Comparisons of quantities of water used by sector
- Progress report reviews
  - Public notice of WRD receipt of report
  - Public comments forwarded to supplier
  - No formal review or approval, but
  - Progress reports will be used when evaluating future plans

Plan Revisions and Updates

- Periodic revision and update schedule
  - Deadline specified in approval order (≈ 10 years), or
  - Earlier if needed for more water authorization
- Plan content
  - Can be full revision or addendum
  - Must meet rule requirements and include current information
  - Must report on implementation of benchmarks
- WRD Review
  - Same process as original plan review
  - Evaluation of progress on previous benchmarks

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Concluding Remarks