The Role of Water Conservation in the Development of an Integrated Water Resource Plan

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CDM

CASTLE PINES NORTH METRO DISTRICT

IWRP Tasks

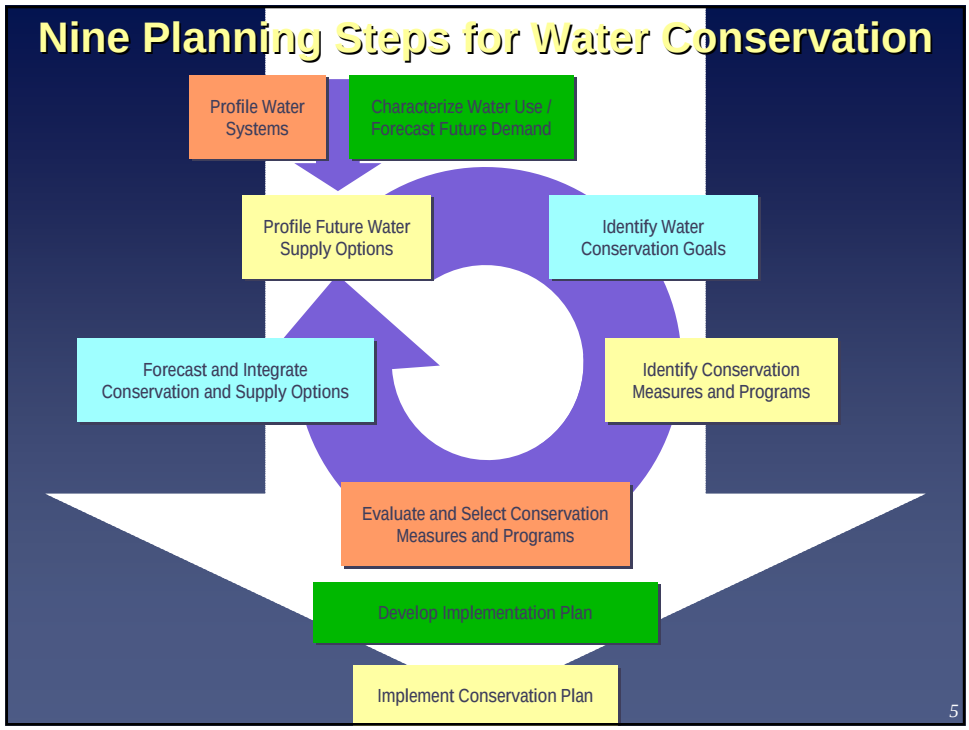
- Develop Future Water Demand Projections
- Evaluate the Role of Water Conservation Strategies to help meet future demands.
- Evaluate Long-Term Sustainability of the District's Existing Groundwater Supply
- **Prepare the Integrated Water Resources Plan and identify possible renewable sources of supply**

Why Conservation Measures Must be Considered

- Replacing Existing Water Supply
  - Less Capital Investment for water rights
  - Helps refine infrastructure requirements
  - Must demonstrate to others that water is being used wisely
  - Effective water conservation measures must be demonstrated as part of any Federal Permitting Process

CWCB's Water Conservation Plan Development Guidance Document

- Template of a Model Conservation Plan
- Provides minimum requirements of the Conservation Act
- Provides current state-of-the-science with regard to water conservation planning
- Can be modified for application to suit needs of entities
- Provides worksheets that can assist in organizing data and calculations



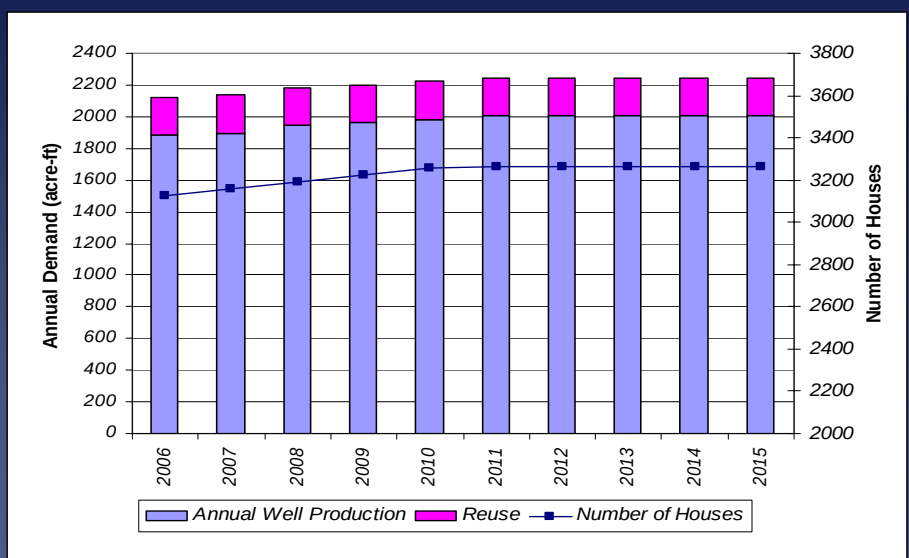
1. Profile Existing Water System

- Physical Characteristics of water supply system
- Identify sources of water
- System limitations
- Water costs and pricing
- Current policies and planning initiatives
- Conservation Activities

1. Profile Existing Water System – Comments

- Limitations of customer demand data
  - Change in billing systems
- Customer groupings for billing systems may be designed for billing purposes rather than for monitoring conservation efforts
- Difficulty in estimating historical conservation water savings
  - Multiple variables (e.g. regional drought campaign and wet year in 2004)
    - Should state provide guidance on assumptions?
  - New conservation measures/programs where savings may not yet be realized and there is a lack of data

2. Characterize Water Use and Forecast Demand



3. Profile Proposed Facilities

- Identify facility needs to meet future demands
  - Purchase of new water rights
  - Storage and conveyance needs
  - Water treatment expansion
- Develop capacity and cost forecasts

3. Profile Proposed Facilities - Comments

- Water entities may be reluctant in disclosing costs given politics and uncertainty
- Process does not allow consideration of the impacts of delaying of water rights acquisition and future availability
- Process does not factor in issues associated with reliance on non-renewable groundwater and delays in acquiring surface water rights
- Worksheet 3-3 – This level of analysis is not very beneficial if future costs are uncertain. Recommend providing escalation and discount rate.
- Qualitative analysis may be more appropriate

4. Identify Conservation Goals

- Identify specific water target savings (in AF or % terms)
- Identify target areas to manage through conservation
  - Per capita water use
  - Peak season demand
  - Customer type
- Iterative process that may be revised through development of Plan
- Document goal development process

5. Identify Conservation Measures and Programs

- Develop preliminary list of conservation measures and programs
- Develop coarse screening criteria
- Documentation of coarse screening process for each measure and program
  - Tedious and duplicative
- Apply screening criteria to identify measures/programs for evaluation

6. Evaluate and Select Conservation Measures and Programs

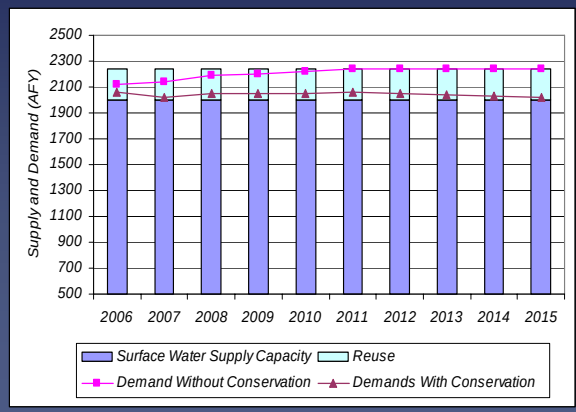
- Estimate water savings
- Estimate costs to implement conservation measures and programs
- Estimate net economic benefits
- Select conservation measures and programs for implementation

6. Evaluate and Select Conservation Measures and Programs - Comments

- Simplify worksheets
- Provide recommended formulas and assumptions for water savings
- Clarify whether cumulative water saving estimates are recommended and if not, what assumptions can be made
- Uncertainties re: life of savings and time period for analysis
  - Life of fixtures, new owner with different landscape preferences, etc.
- An economic analysis that is more qualitative may be more appropriate for entities that lack data on future water supply costs and historical conservation savings

7. Integrate Resources and Modify Forecasts

- *Revise Demand Forecasts*
- *Identify Project-Specific Savings*
- *Revise Supply-Capacity Forecasts*
- *Summarize Forecast Modification and Benefits*



7. Integrate Resources and Modify Forecasts – Comments

- Qualitative Analysis for entities not anticipating modifying infrastructure
  - Need data on future supplies and costs
  - Confidence levels in water savings estimates
- Daily Demand Data
  - Sizing peak day infrastructure

8. Develop Implementation Plan

- Implementation Schedule
- Plan for Public Participation
- **Plan for Monitoring and Evaluation Process**
- Plan for Updating and Revising Conservation Plan
  - Covered entity must update the Plan at a minimum of every 7 years

9. Implementation of the Plan

- Monitor Conservation Efforts
- Evaluate Effectiveness of Measures and Programs
- Revise Conservation Activities to Improve Effectiveness
- Revise Conservation Plan

Photos & notes by Jim Knopf, landscape architect
WaterWise Landscaping Trees, Shrubs & Vines

Final Conclusions

- Future Demands reduced by approximately 10% beyond current conservation measures which equates to approximately 200 acre feet.
- Evaluation of existing conservation measures identified some ineffective programs.
- Implemented additional conservations programs and implemented additional rebate programs.

Castle Pines North Rebate Program

Item	Benefit/Savings	Rebate
Rain Sensors	Overrides irrigation system by detecting rainfall	$100 (Limit one per household)
Programmable ET Controller	Regulates irrigation time based on temperature, humidity	$200.00 (Limit one per household)
Low Flow Toilets	Uses 1.6 gallons per flush; Old toilets use three to five gallons per flush	$100 (Limit three per household)
Front Loading Washing Machines	Uses 20 gallons per load; Horizontal machines use 45 gallons per load	$125
20% Rebate	Reimbursement for customers whos annual water usage is less than 20% of allotted budget	20% reimbursement
Showerheads	Uses 2.4 gallons per minute; Old showerheads use 4	$10 per showerhead (Limit three per

Additional Programs to be implemented 2006 - 2007

- Audits for Residential Homes at Tier 4 Usage
- Indoor and Outdoor Audits for homes built prior to 1994
- Audit for HOA Irrigation
- Audit of Golf Course Usage
- Sonic Leak Detection
- Develop a web based water audit for individual homes
- Implement the Waterwiser Program

Questions????