The Customer is Key - How to Design A Reuse System to Maximize Satisfaction and Minimize Cost

NEWEA Water Reuse & Industrial Wastewater Conference

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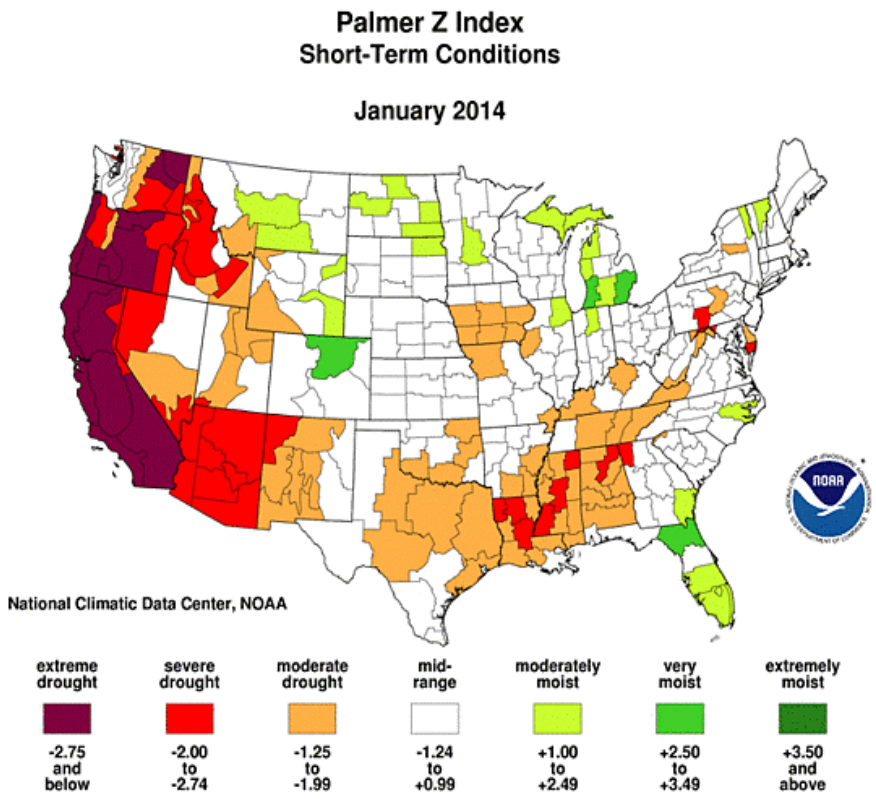
Lynne B. Putnam, PE ENV SP

Overview

- Water Reuse is Essential for Sustainable Growth
- Reuse Water is a Product for Sale
- Planning for Reuse Must Include the Viewpoint of Customers to complete Design Criteria
- Understanding the Needs and Requirements of Customers is Key to Success and Growth of Reuse Program



Headlines

- **Sacramento-area water agencies call state drought program illegal (CA)**
- **Watering Restrictions -** Irrigation schedule, enforcement & new sod exception (FL)
- **Water Use Recommendations and Restrictions For a Three-Phase Drought Operating Plan (Delaware)**

Dewberry

“New” Standard Discharge Limits

- Enhanced Nutrient Removal
  - Total Nitrogen < 3 ppm
  - Total Phosphorous < 1 ppm
  - BOD/TSS 10/10 ppm (Sometimes 5/5)
  - Chlorine residual = 0 ppm
- Typically Filtered
- Frequently UV Disinfection
- **Expensive Water – Now a Product**

Reuse Customer Drivers

- Occasional Drought Restrictions – Need more reliable supply
- Poor groundwater options
- Rising Water Costs
- Sewer Bill related to Water Bill
- Push to reduce operation costs
- Some customers wish to appear more “green”
- Mandatory regulations

Customer Drivers Preselect Customer Base

Driver	Public Customer	Private Customer
Reliable, high quality supply	Prisons, offices, golf courses, parks, colleges, sports complexes, landscaped areas	Industries, power plants, golf courses, stadiums, campus-type commercial developments
Reduction in operating costs	Prison, golf courses, parks, colleges	All of the above
External/regulatory push for reuse	Mandatory uses at prisons/state buildings	May be tied to water supply "allowance"
Desire to improve sustainability/resiliency of operations	Comprehensive public users	Power plants, industries not traditionally seen as "green"

Potential Customers

Customer Group	1 Golf Courses	2 Elementary Middle Schools	3 High Schools	4 Colleges	5 Public Buildings	6 Dust Control	7 Industrial Uses	8 Hospitals	9 Prisons	10 Groundwater Recharge	11 Wetlands Restoration	12 Agriculture	13 Forest Establishment	14 Alternate Fire Supply	15 Parks	16 Sports Complexes	17 Private Office Complex	18	19	20	21	Total
Seasonal	I	I	I	I	I	A	I	I	I	E	E	I	E	A	I	I	I					17
Year-round					A		C	C	M	E				A		C	A					8
Public	I	I	I	I	I	A		M		E	E		E	A	I	I						13
Private	I		I	I			M	M				I	E	A		M	M					10
High Pressure Need		I	I	I	M	A		M	M	E			E	A	I	M	M					13
No/Low Pressure	I						M			E	E	I	E		I							7
Low Salinity	I						C	C		E	E	I	E			C						8
No/Low Chlorine										E	E	I	E	A								5
Low Ammonia							C	C		E	E					C						5
Low Phosphorous							C	C		E	E					C						5
Metered	I	I	I	I	M	A	M	M	M	E	E	I	E	A	I	M	M					17
Non-metered											E		E	A	I							4
Voluntary	I	I	I	I		A	M	M		E	E	I	E	A		M	M					14
Mandatory	I				M				M	E	E				I							6
Trained Staff	I			I			C	M	M	E	E	I	E	A	I	M						12
Volunteers/Untrained		I	I		M	A						I	E	A		I	M					9
Sensitive Base		I	I		M			M		E	E		E		I	I						9
Practical Base	I			I		A	M		M			I		A		C	M					9
Short-term						A					E		E									3
Long-term	I	I	I	I	M		M	M	M	E	E	I	E	A	I	M	M					16
Total	11	8	9	9	9	8	12	13	8	15	15	11	15	13	10	15	9					190

Color Key									
I	Irrigation	C	Cooling	A	Alternate Plumbing	E	Environmental	M	Multiple

Industrial Customers

- Power Plants – large water users, $ savings
- Food Processing – large water user, discharge
- Breweries – large water user, discharge
- Refineries – large water users
- Manufacturing – large water users
- Computing Centers – large water users for cooling

Sample Reuse Design Parameters – Customer Based

Type of Use	On Site Storage	Min. Pressure Needs	Quality Limits	Peaking Factor	Waste Discharge
Agriculture	Yes	40 psi	Customer stated	2	Run-off
Park	No	60 to 80 psi	Customer stated	Up to 6	Run-off
Golf Course	Yes	40 psi	SAR	3	Run-off
Prison Alternate Plumbing	No	60 to 80 psi plus	ENR, filtered, chlorine residual	Up to 6	Sewer
Cooling	No	60 to 80 psi plus	ENR, low TDS	4	Surface or None
Cooling	Yes	40 psi	ENR, low TDS	2	Surface or None
Dust Control	Yes	40 psi	Customer stated	3	None

Other Design Parameters

- Distance and Elevation to Customer - pumping
- Proximity to Other Customers – pipe size
- Ability of Customer to “Switch Off” – water age
- Locations to bleed off system – sewer or storage
- Future Growth at Higher Elevations – scalping
- Ability of Customer to Operate System - SCADA

Targeted Customers

Customer Group	1 Golf Courses	2 Elementary Middle Schools	3 High Schools	4 Colleges	5 Public Buildings	6 Dust Control	7 Industrial Uses	8 Hospitals	9 Prisons	10 Groundwater Recharge	11 Wetlands Restoration	12 Agriculture	13 Forest Establishment	14 Alternate Fire Supply	15 Parks	16 Sports Complexes	17 Private Office Complex	18	19	20	21	Total
Seasonal Demand	1		.1	.15											.25							1.5 MGD
Year-round Demand							1		.15													1.15 MGD
Public	x		x						x						x							4
Private				x			x															2
High Pressure Need			x	x					x						x							4
No/Low Pressure	x						x															2
Low Salinity							x															1
No/Low Chlorine																						0
Low Ammonia							x															1
Low Phosphorous							x															1
Metered	x		x	x			x		x						x							6
Non-metered																						0
Voluntary	x		x	x			x															4
Mandatory									x						x							2
Trained Staff	x			x			x		x						x							5
Volunteers/Untrained			x																			1
Sensitive Base			x												x							2
Practical Base	x			x			x		x													4
Short-term																						0
Long-term	x		x	x			x		x						x							6

Color Key									
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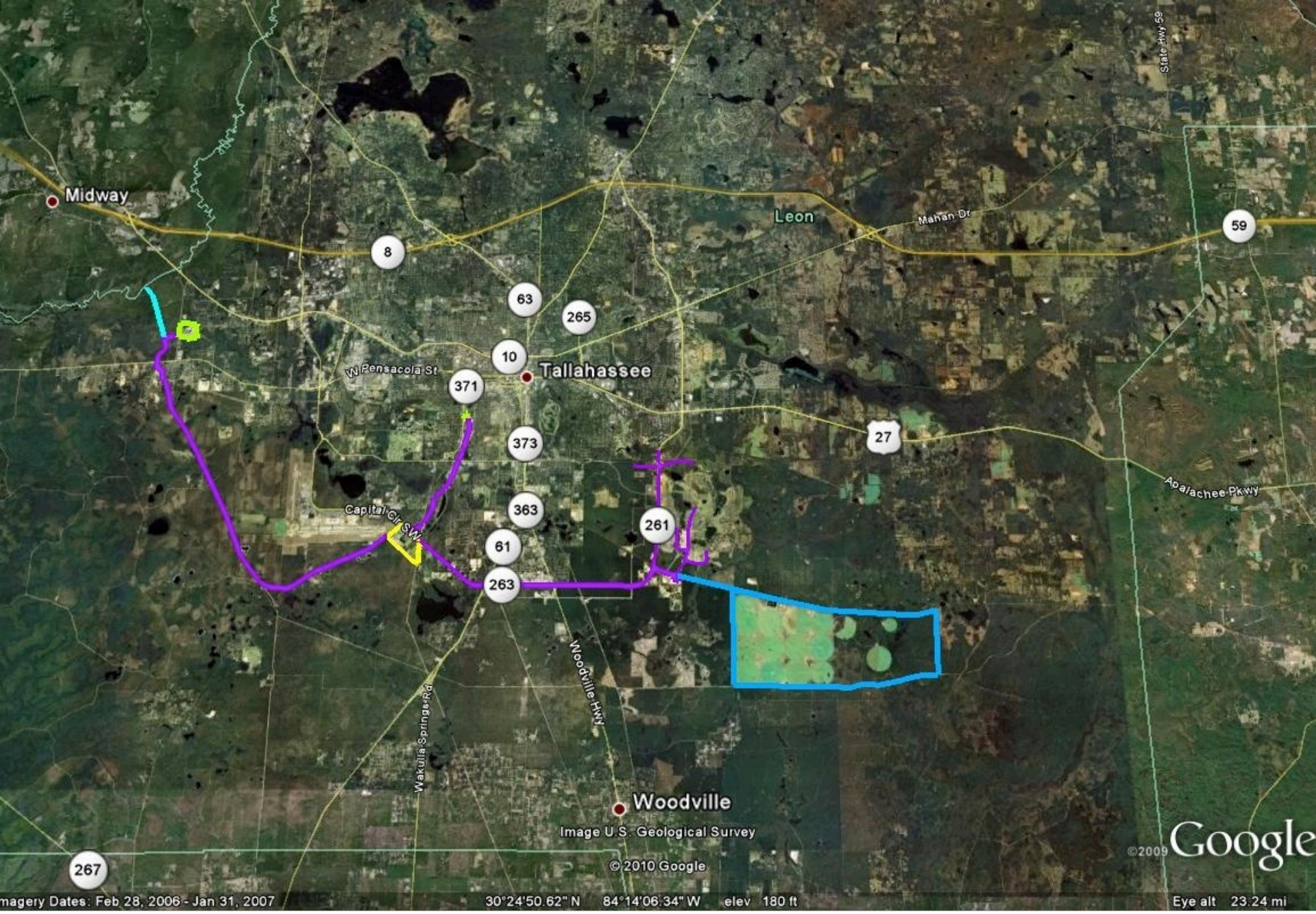
Midway
Leon
Mahan Dr
State Hwy 59
59
8
63
265
10
Tallahassee
W Pensacola St
371
373
27
Apalachee Pkwy
Capital Cir SW
363
261
61
263
Woodville Hwy
Wakulla Springs Rd
Woodville
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267
magery Dates: Feb 28, 2006 - Jan 31, 2007
30°24'50.62" N 84°14'06.34" W elev 180 ft
Eye alt 23.24 mi

Why Focus on Customer Needs

- Voluntary vs. Mandatory Usage
- Maintain “Value” of Reuse Water to Customers
- Optimize Operating Parameters
- Build for Expansion
- Enlist Sustainability Partnership
- Promote Public Support
- Build in Growth to Optimize Reuse Investment

Questions