



# Laguna Treatment Plant Disinfection System Improvements

Emma Walton, Deputy Director of  
Engineering Resources  
Board of Public Utilities | Study Session  
July 18, 2019



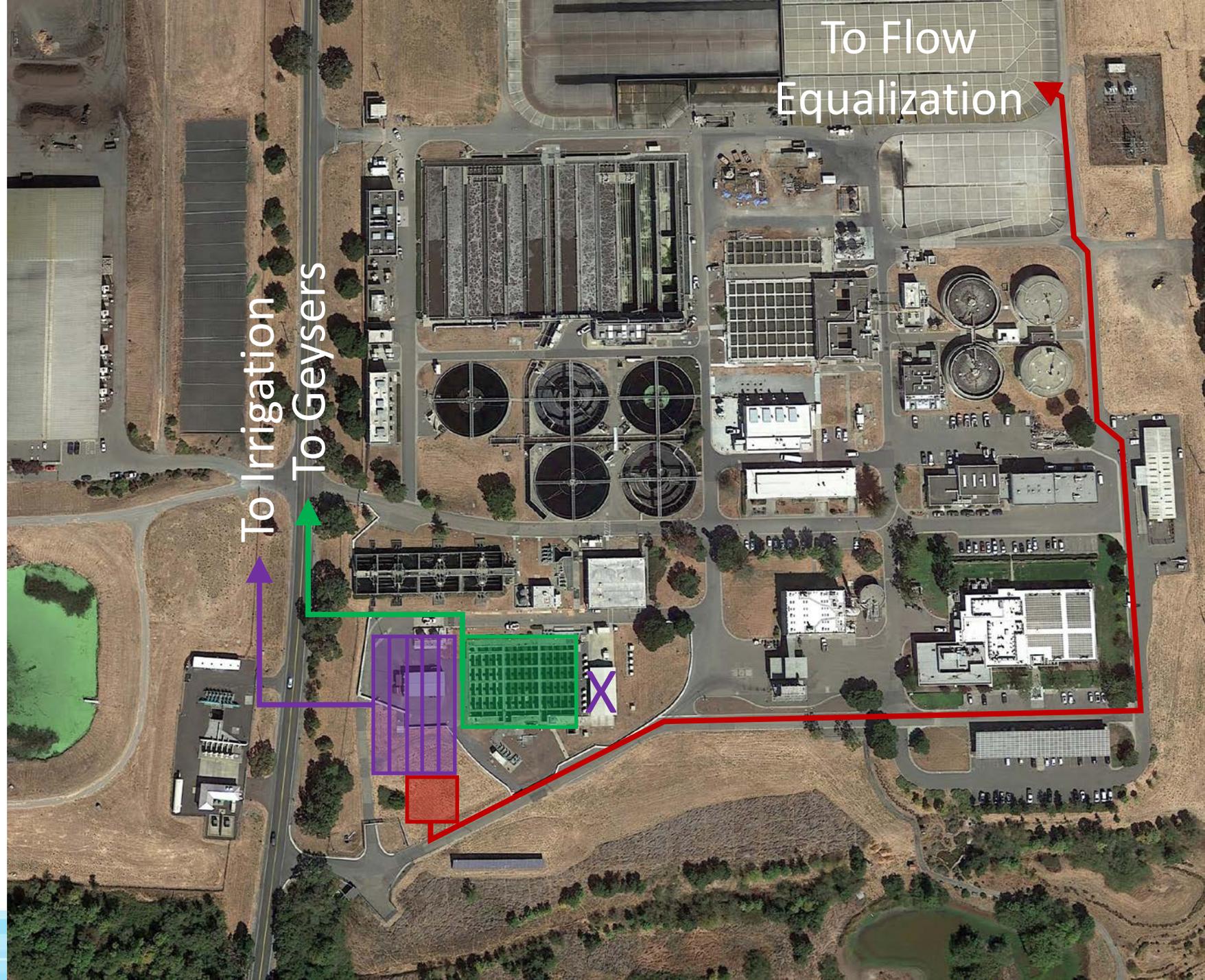
# Project Background

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- Pre-1998 Disinfected with Gaseous Chlorine
- 1998 Commission UV System  
67 MGD Capacity
- 2012 DDW De-Rated UV System  
~~67~~ > 48.5 MGD Capacity
- 2013-2015 Alternatives Analysis  
  
Issue #1: Insufficient Capacity  
Issue #2: End of Useful Life

# 2016 Preferred Alternative

- Replace (E) UV with (N) UV
- Add Supplemental Hypo-Chlorination
- Add On-Site Diversion



# Project Timeline



Jan 2016  
BPU Approved  
\$2.8M PWO  
with Carollo

Nov 2016  
BPU Approved  
\$4.7M MOU  
with Calgon



July 2016  
Supplemental  
Hypo Removed  
from Scope

# MOU with Calgon

Intent: Pre-Selection of Equipment

- Equipment Configurations Differ Significantly
- Designing Around Unknown Equipment = Inefficiencies and CCOs



**Calgon Carbon**



**Xylem/Wedeco**



**Trojan**

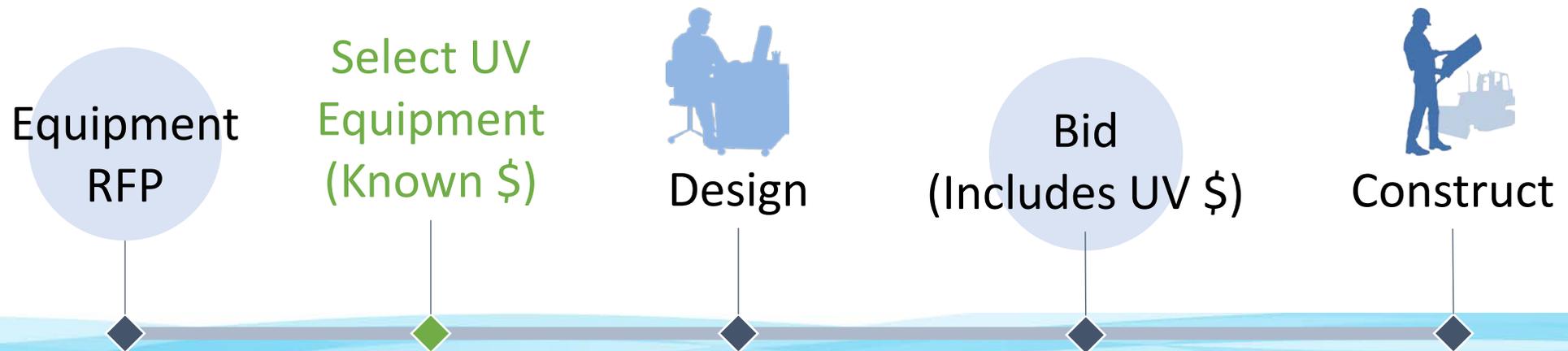


**Suez/Ozonix**

# MOU with Calgon

## Benefits of Pre-Selection

- Eliminates Design Inefficiencies
- City Selection based on Best Value
- Competitive Pricing
- Minimizes Risk



# MOU with Calgon

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- BPU Approved MOU Nov 2016
  - Guaranteed Price of Equipment \$4,726,500
  - Price Held for 18 months
  - MOU Expired June 2018
  - Communication with Calgon has been On-going
- \*Need to Renegotiate and Re-Approve MOU



# Project Timeline



# 2017 Value Engineering Effort

## Intent – Consider More Economical Disinfection Options

- Reconsider Supplemental Hypo-Chlorination
- Review Design Parameters

# Reconsider Supplemental Hypo-Chlorination

Original Approach - Install Supp-Hypo in Advance of New UV

- Benefits
  - Utilize (E) Chlorine Contact Basins
  - Extend Useful Life of (E) UV
  - Push out Capital Investment
- Problem
  - UV Beyond Useful Life
  - Need Capital Investment Now
  - Regional Board has Requested a Compliance Schedule

Question Becomes: Are there benefits to having two Disinfection Systems?



# Reconsider Supplemental Hypo-Chlorination

**New UV System (67 mgd)**

**New UV (43 mgd) w/  
Supp-Hypo (30 mgd)**

Single Process

Dual/Parallel Processes

67 mgd Capacity

73 mgd Capacity

↑ Capital

↓ Capital

↓ O&M

↑ O&M

# Cost Considerations

	New UV System	New UV w/ Supp-Hypo
<b>Capital Costs (\$M)</b>		
New UV	\$20.5	\$14.5
New Supp-Hypo	-	\$2.5
Off-Spec Diversion	\$15.5	\$15.5
<b>Total Capital Costs</b>	<b>\$36.0</b>	<b>\$32.5</b>
<b>O&amp;M Costs (\$M)</b>		
Annual O&M Costs	\$0.53	\$0.6
<b>20-year O&amp;M Costs</b>	<b>\$10.6</b>	<b>\$12.0</b>
<b>Total Capital + 20-yr O&amp;M</b>	<b>\$46.6</b>	<b>\$44.5</b>

# Operational/Regulatory Considerations

- In-plant Upstream Processes
    - Limits Nutrient Removal Options
  - Disinfection System Operations
    - Difficult Startup/Shutdown
    - Difficult Flow Split
    - Multiple Disinfection Compliance Points
  - Reuse Operations
    - Potential Benefits for Geysers Biofouling
    - Disinfection By-Products may Limit Discharge Abilities
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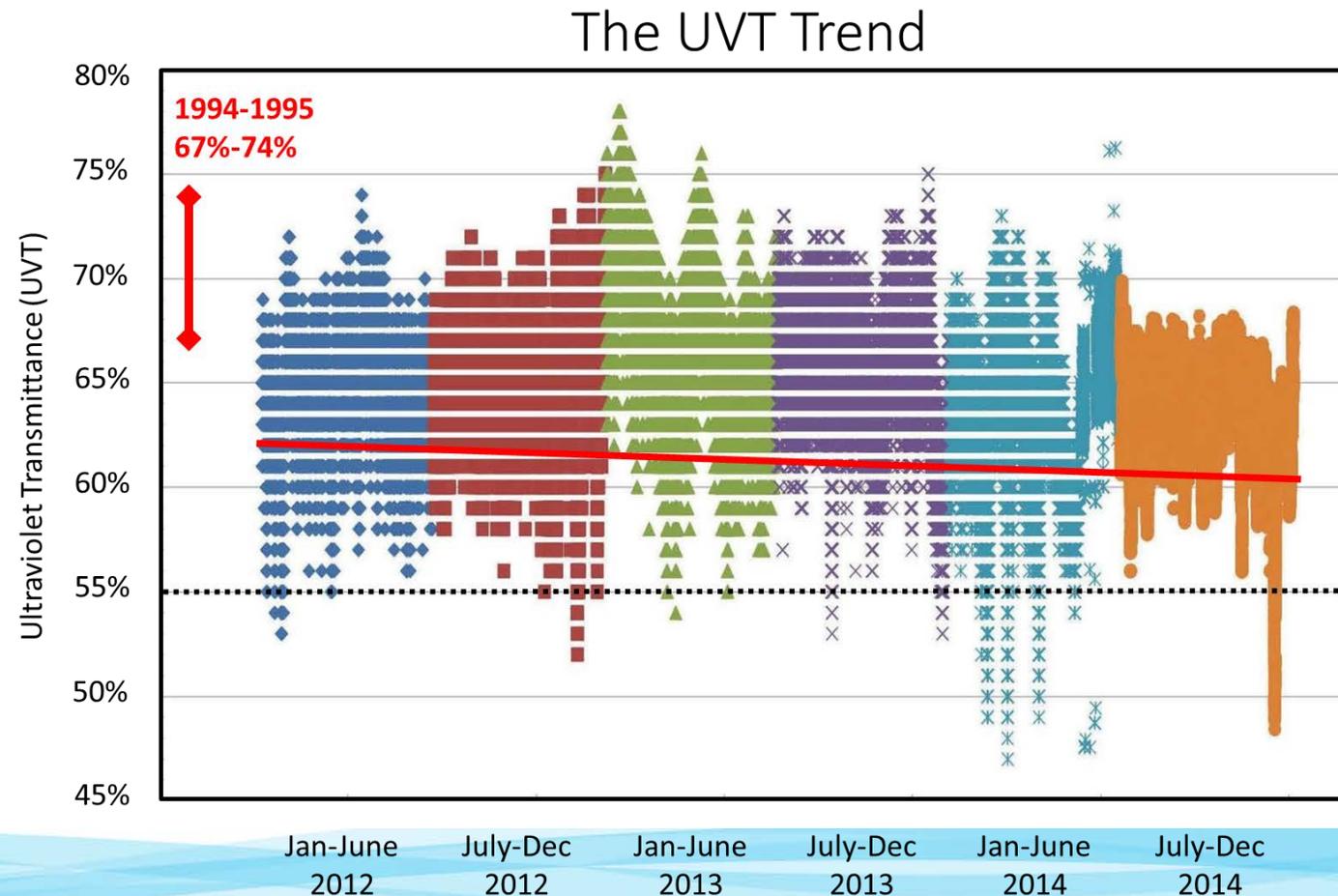
# Recommended Disinfection Approach

Remove Supp-Hypo, Construct Full Capacity UV

- Single Process
- Provides most Future Flexibility
- Challenges with Supplemental Hypo-Chlorination don't overcome Benefits of Additional Capacity

# Review Design Parameters

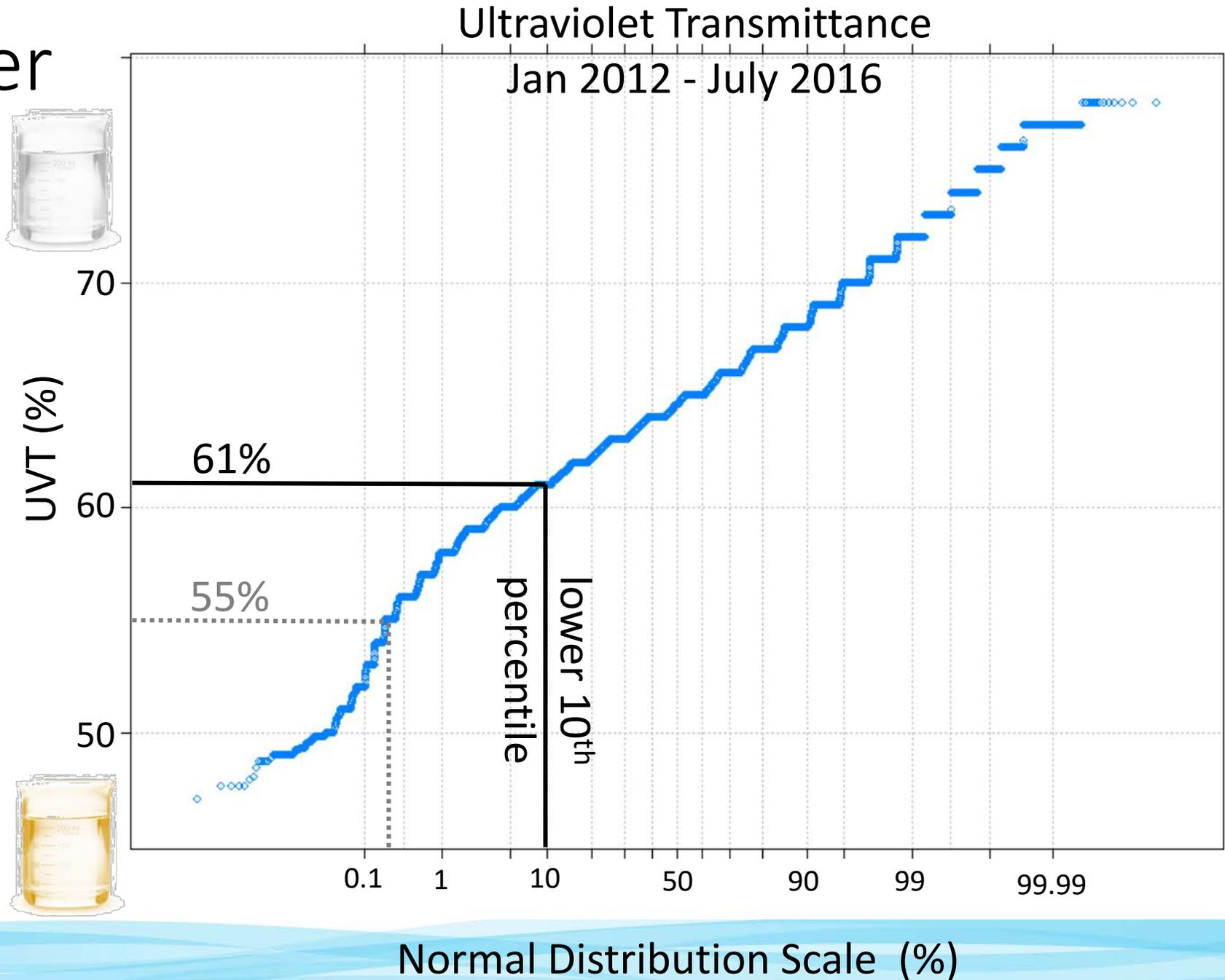
- Ultraviolet Transmittance (UVT)
  - Original Design - 55%
- Capacity
  - Original Design - 67 mgd



# Design Parameter Review - UVT

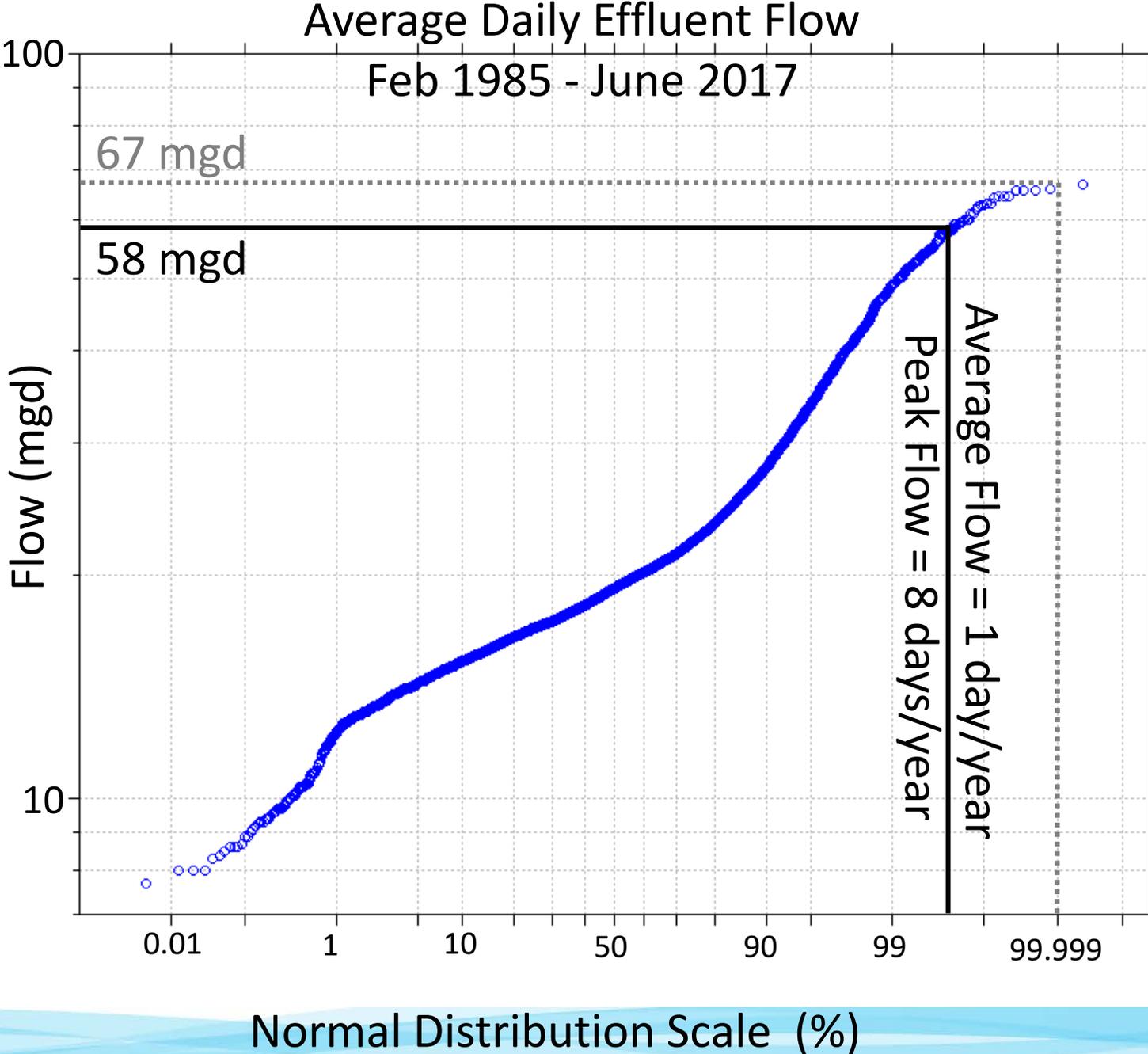
VE Recommendation

55% → 61%



# Design Parameter Review - Capacity

VE Recommendation  
~~67 mgd~~ → 58 mgd



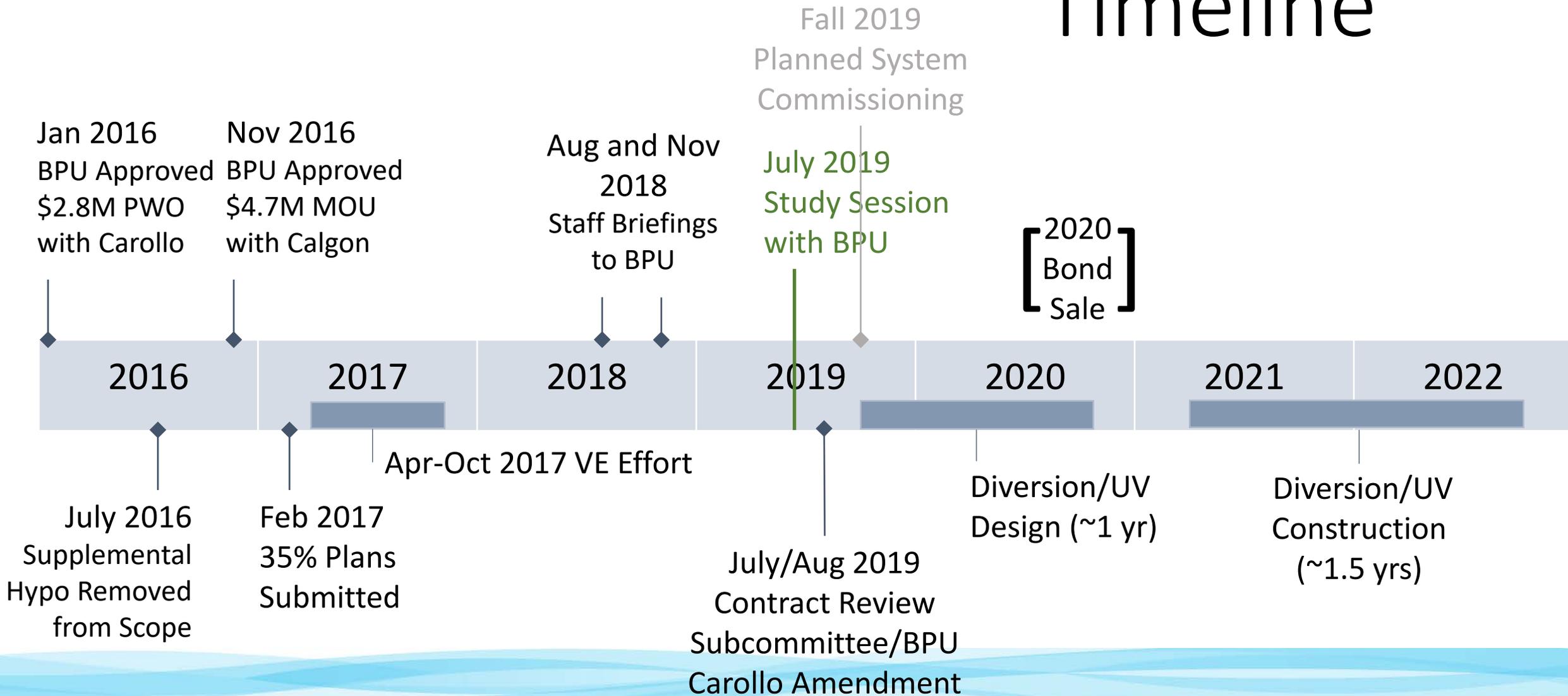
# Recommended Design Parameters

~~55%~~ → **61% UVT** (VE Recommendation)

~~67 mgd~~ → 58 mgd (VE Recommendation)  
+ 6 mgd (10% Operational Buffer)  
= **64 mgd (Design Process Capacity)**

+ 6 mgd (10% Safety Factor)  
= 70 mgd (Peak Hydraulic Capacity)

# Project Timeline



# First Next Step

- Amend Carollo Contract (~\$1.5M anticipated)
  - July 29, 2019      Contract Review Subcommittee
  - Fall 2019          Anticipated BPU Approval
- Why Amend?
  - Value Engineering Effort
  - Delay in Project
  - Changes in Scope

# Future Next Steps

- Re-Execute MOU with Calgon
  - Late 2019            BPU Approval
- Bond Issuance
  - Late 2020            BPU Approval
- Award Construction Contract
  - Early 2021            BPU Approval
  - Late 2022            Commission  
                                Diversion/UV System



# Questions?

