

Technical Solutions Pilot Study

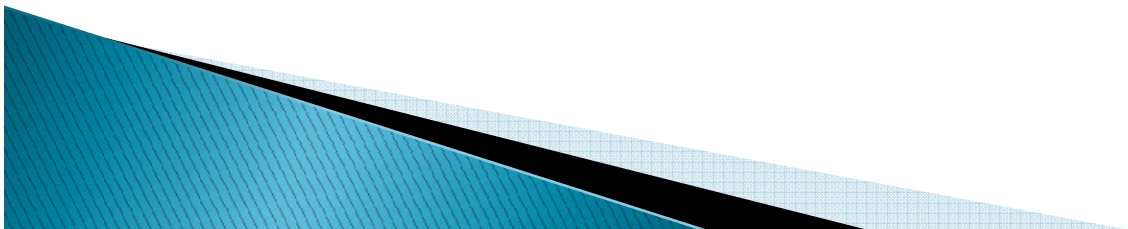
Tulare Lake Basin Disadvantaged Community
Water Study

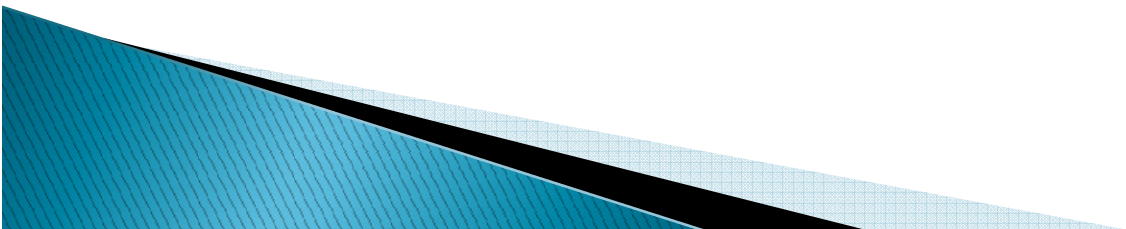
Pilot Stakeholder Advisory Group
September 11, 2013



Tulare Lake Basin (TLB) Study: Goals and Objectives

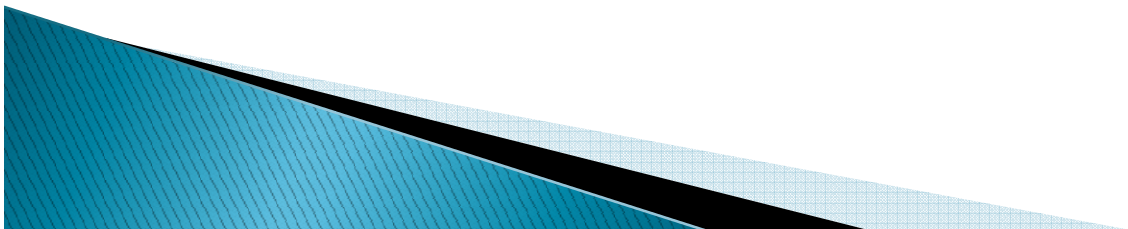
- ❑ Evaluate Water and Wastewater Needs of Disadvantaged Communities within the TLB
- ❑ Develop List of Priority Issues and Potential Solutions through a Stakeholder Process
- ❑ Develop a plan that provide DACs safe, clean and affordable potable water supply and effective and affordable wastewater treatment and disposal options (Replicable models for our region and beyond)





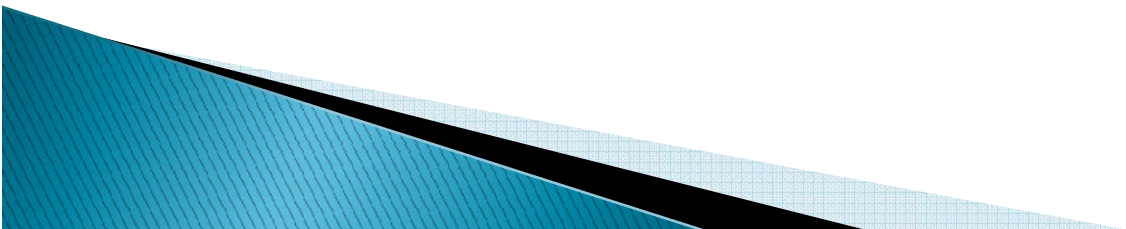
Goal of Meeting

1. Provide an overview of the Draft Technical Solutions Pilot Project Report
2. Obtain Your Feedback and Recommendations – Complete PSAG review Process #1



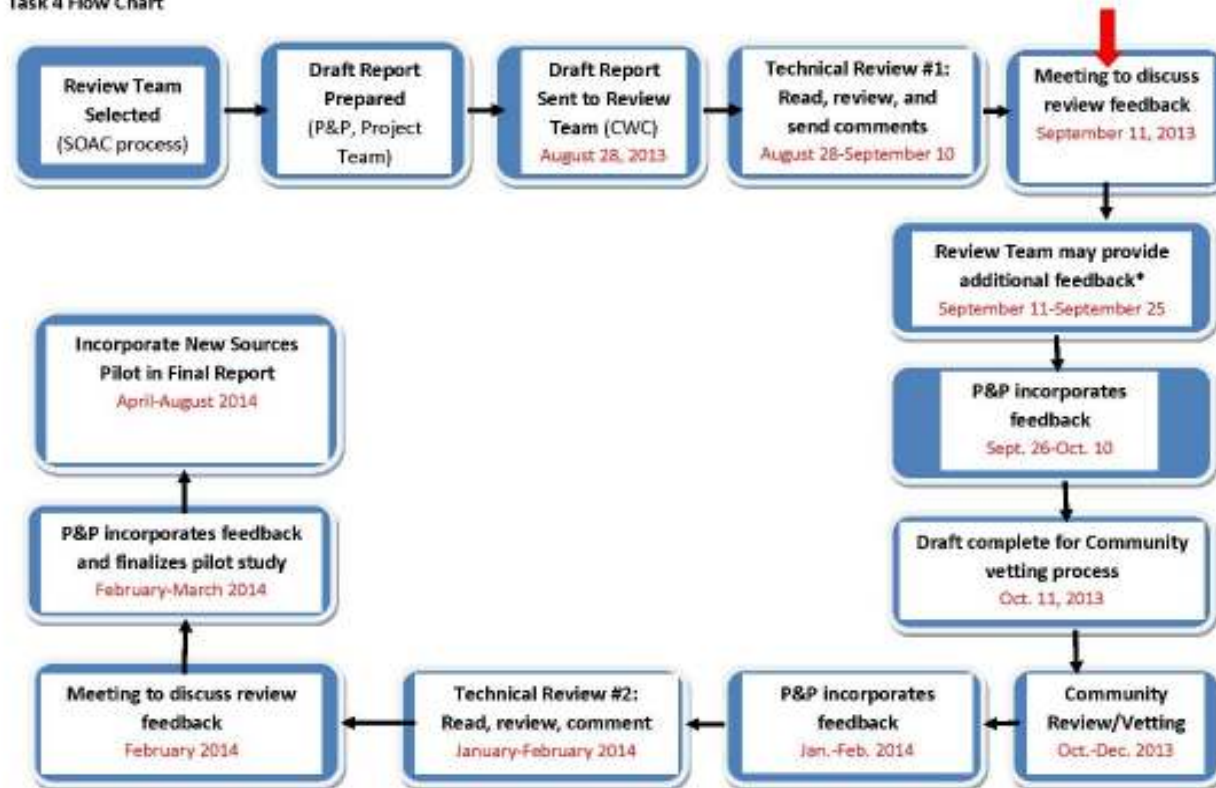
Technical Solutions Pilot Study

- ▶ One of 4 pilot studies
- ▶ Others are:
 - Management and Non-Infrastructure Solutions
 - New Sources
 - Individual Household Systems



Technical Solutions Pilot Study Progress

Technical Solutions Pilot Project
Task 4 Flow Chart

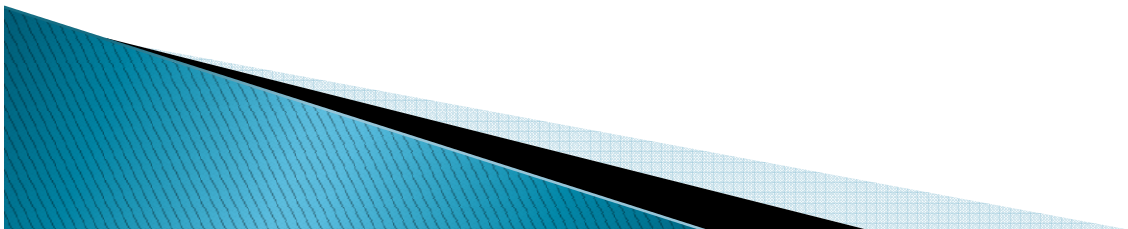


*Additional feedback may be provided to Terry Schroeffer by email (tschroeffer@ppeng.com)
Or mail to Provost & Pritchard, Attn: Terry Schroeffer, 130 N. Garden Street, Visalia, CA 93291

Role of the (Pilot Stakeholder Advisory Group) PSAG

Provide **feedback** and guidance during the PSAG Review Process to help ensure solutions are realistic, accurate and useful

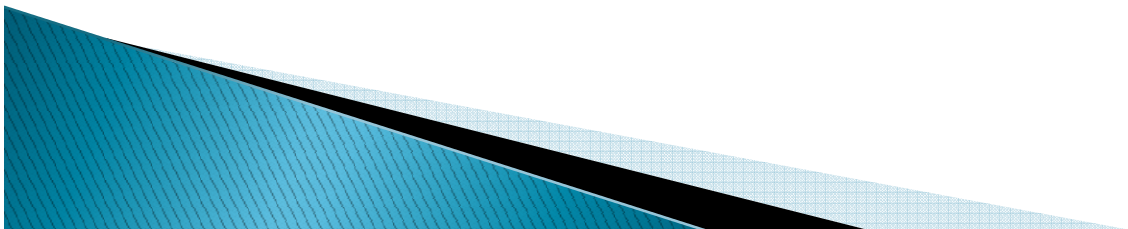
Build investment and momentum in the implementation of the pilot and solutions



Technical Solutions –Definition

“Constructed or operational improvements to water or wastewater systems”

Example: Water Treatment Plant
Energy Efficiency Improvements
Water conservation: metering



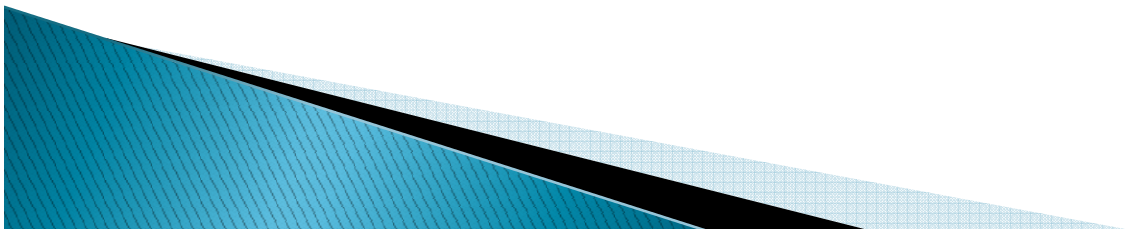
Technical Solutions Considered

- ▶ Blending
- ▶ Water/wastewater treatment
- ▶ Joint or regional residuals management
- ▶ Water and energy use efficiency improvements
- ▶ Dual water distribution



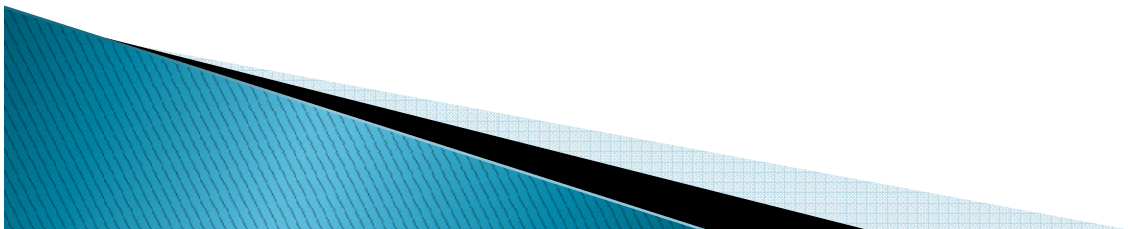
Water treatment is a “last resort” for water systems

- ▶ CDPH does not want you to construct a water treatment plant if you do not have the technical, managerial and financial capability (TMF) to sustain operations
- ▶ Other alternatives should be considered first.
- ▶ Threshold size for adequate TMF is probably greater than most DACs.



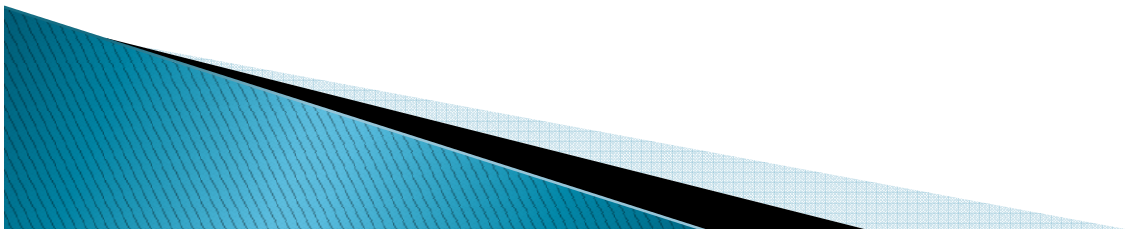
Contaminants of Concern in TLB

- ▶ Coliform rule violations (mostly under control with chlorination)
- ▶ Arsenic
- ▶ Nitrate
- ▶ DBPs –TTHM and HAA5
- ▶ Uranium, fluoride, perchlorate
- ▶ DBCP, PCB and other organics



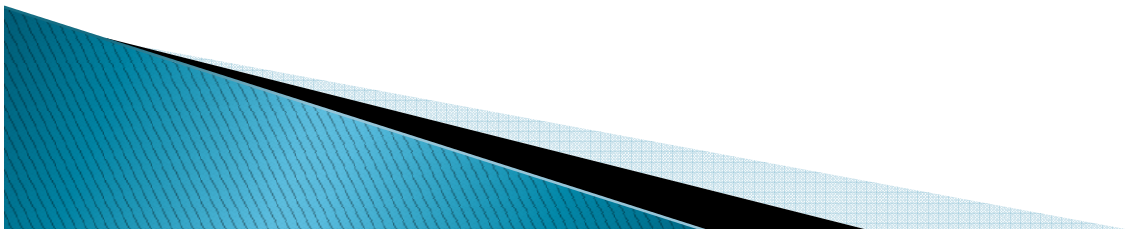
Future Maximum Contaminant Levels (MCLs)

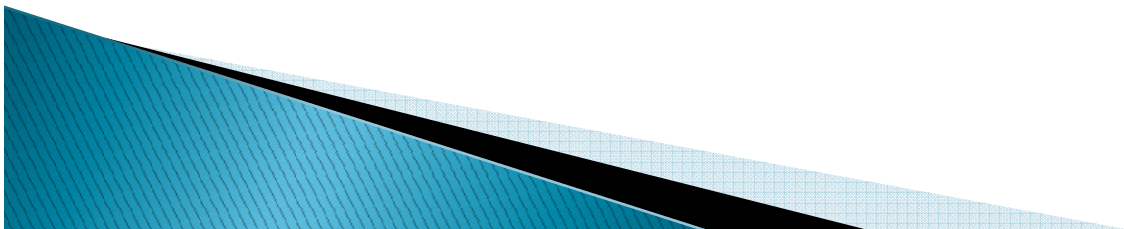
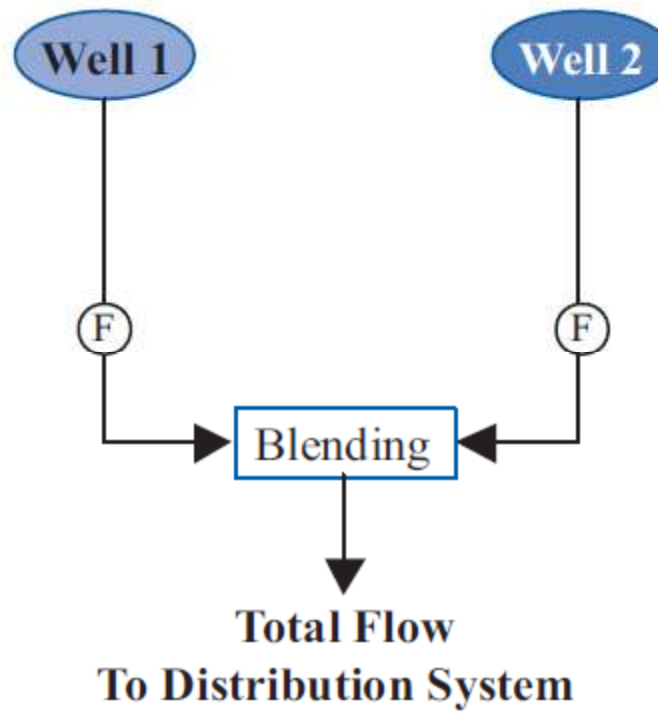
- ▶ Hexavalent chromium (chrome 6)
- ▶ 1,2,3 TCP
- ▶ The impact on TLB DACs is not well known, but may be significant, especially for TCP
- ▶ Treatment options must be flexible to treat multiple contaminants



Blending

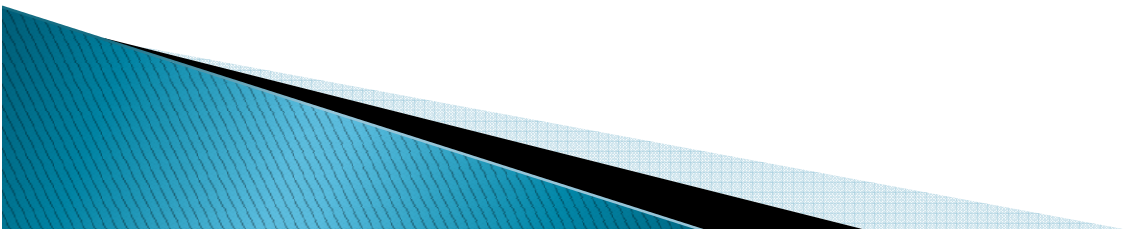
- ▶ Use better quality water to blend with lower quality water to produce water meeting MCL
- ▶ Applicable for systems with multiple sources, especially when one source only slightly exceeds MCL.
- ▶ Diminished returns as low quality water exceeds 30% above MCL
- ▶ Lowest cost technical solution if applicable



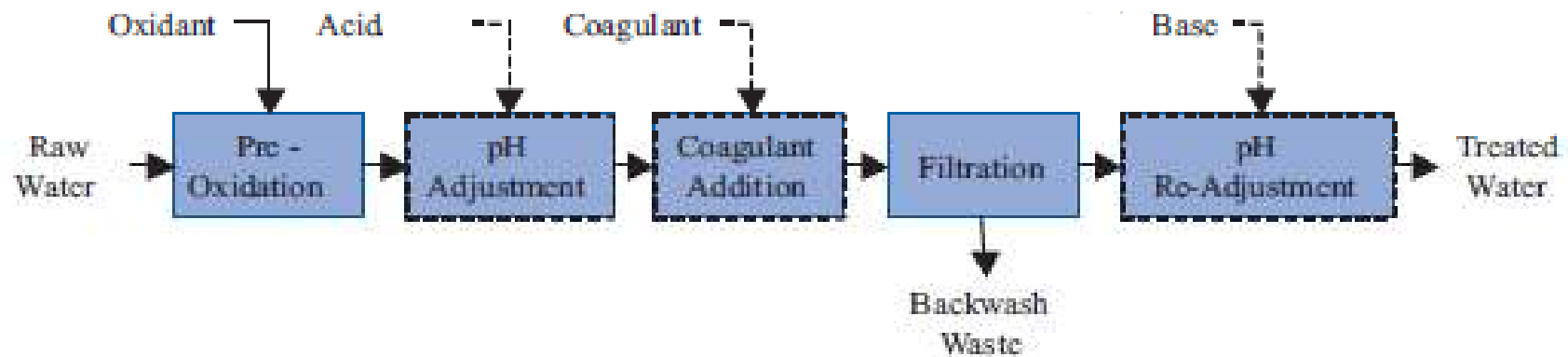


Arsenic

- ▶ Ion Exchange (IX)
- ▶ Adsorption
- ▶ Coagulation/Filtration (CF)

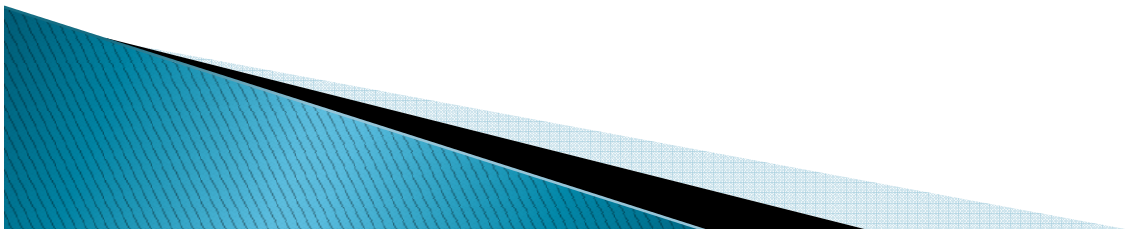


Coagulation Filtration Flow Diagram



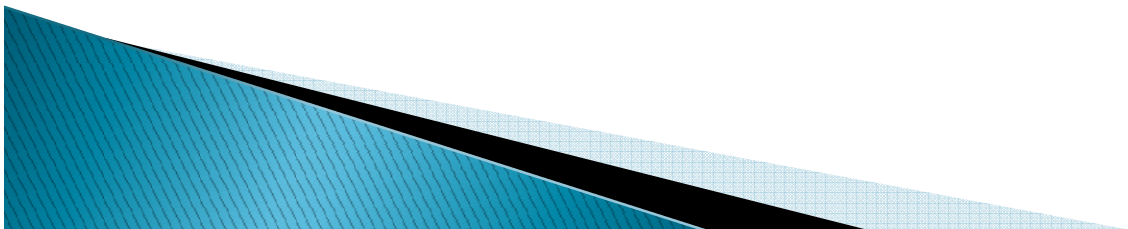
Nitrate Treatment

- ▶ Nitrate Removal
 - Ion Exchange (IX)
 - Reverse Osmosis (RO)
 - Electrodialysis
- ▶ Nitrate Reduction
 - Biological Denitrification
 - Chemical denitrification



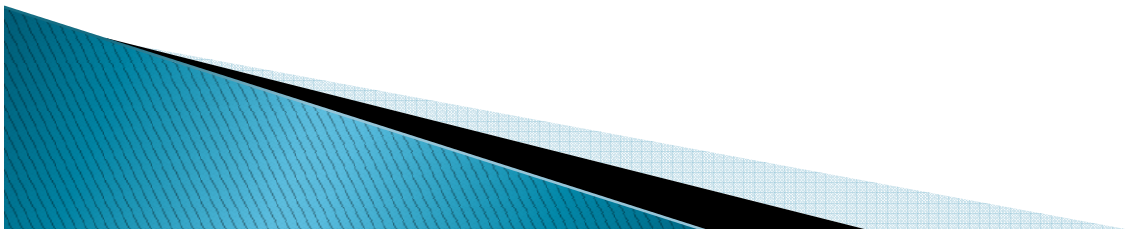
Treatment has Operational Complexity

- ▶ Often requires chemical injection at multiple locations to adjust pH, oxidize contaminants or coagulate
- ▶ Backwashing and media regeneration creates residuals that must be managed/disposed
- ▶ System operating complexity requires computer controls
- ▶ May require T3 operator



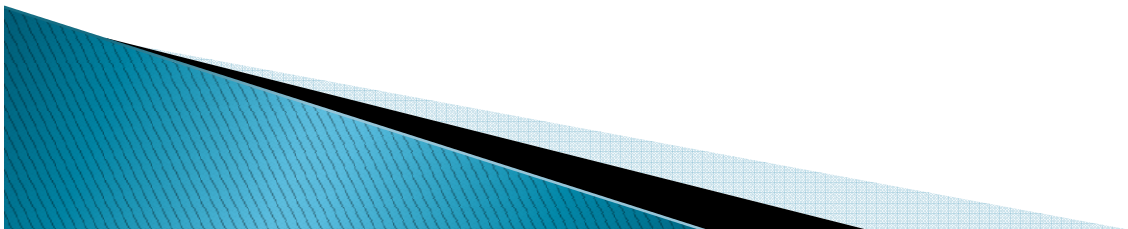
Residuals Management

- ▶ Many treatment processes produce residuals that require disposal
- ▶ Residuals and solids disposal can be as much as 50% of the cost of treatment
- ▶ Brine and concentrates have limited disposal options in the TLB



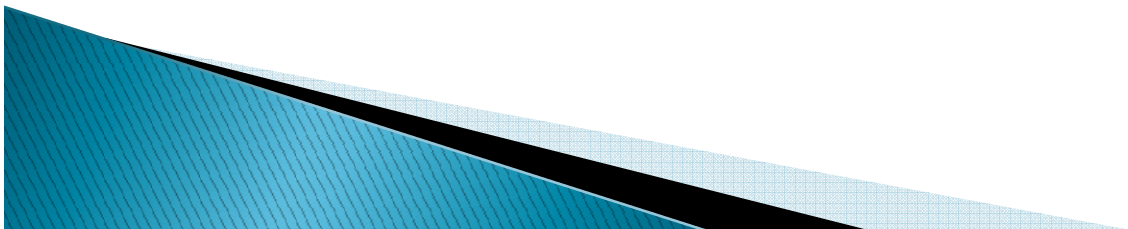
Dual Water Distribution

- ▶ Install 2 water systems, one for inside water use (potable) and one for outside use (non-potable)
- ▶ Reduces volume of water to be treated
- ▶ Costly to construct but may be considered for new construction or where costly treatment is needed and outside use is high.



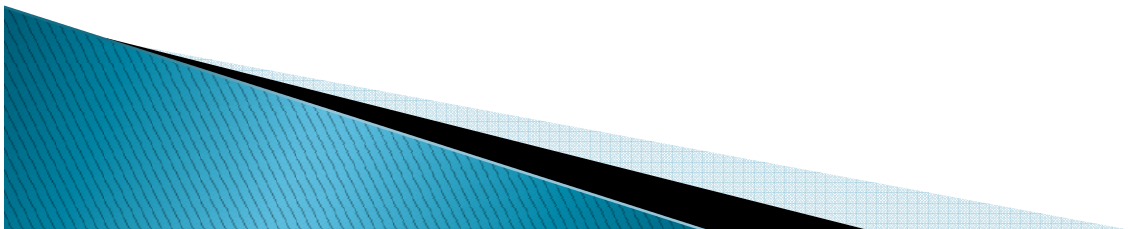
Water & Energy Use Efficiency

- ▶ Goal is to save energy and operating costs
- ▶ Some is “low hanging fruit”
- ▶ Water meters and supply meters will bring water use efficiency and will lower water use
- ▶ All DACs should do energy audit(s)
- ▶ Complete well test every 2 to 3 years



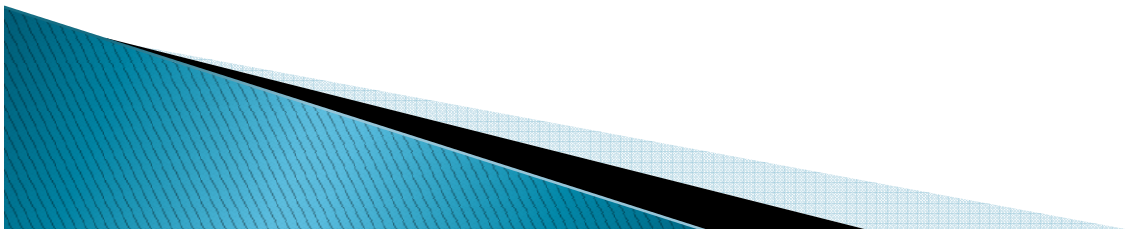
Wastewater

- ▶ As with water, consolidation is preferred solution
- ▶ Land discharge systems preferred over NPDES discharge
- ▶ New systems may require nitrification/de-nitrification (N/dN)– increased complexity and fewer available treatment alternatives
with likely higher grade of Wastewater Treatment Operator required



Wastewater (cont)

- ▶ Water Board will require anti-degradation analysis to protect groundwater
- ▶ Older low tech pond systems may no longer be suitable with N/dN requirements
- ▶ Need to carefully review waste discharge requirements and monitoring so that it is appropriate for site and flow



Reviewer Feedback

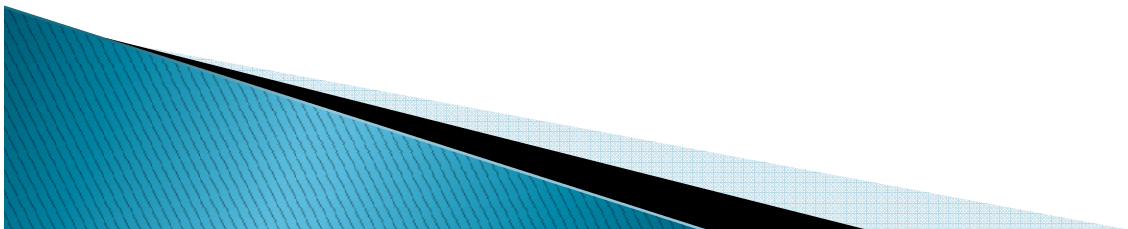
- ▶ Your feedback is needed and welcome!
- ▶ Feedback on previous questions provided upon release of the Draft Pilot Report?
- ▶ Key topic areas for today



Reviewer Feedback:

Key Topic Areas For Today

- ▶ Have we overlooked a technical solution that has worked for you?
- ▶ Do you have experience, positive or negative with any technical solution?
- ▶ Which communities would be a good model to apply these solutions?



Next Steps and Deadline to Provide Comments:

- ▶ Final Comments due on September 25, 2013
 - Via email at tschroepfer@ppeng.com
 - or by phone at (559) 449-2700
- ▶ Community Review Process
 - October – December 2013
- ▶ Updated Report available for review
 - January – February 2014
- ▶ PSAG Meeting #2
 - January – February 2014

