



PROJECT WORK ORDER AMENDMENT

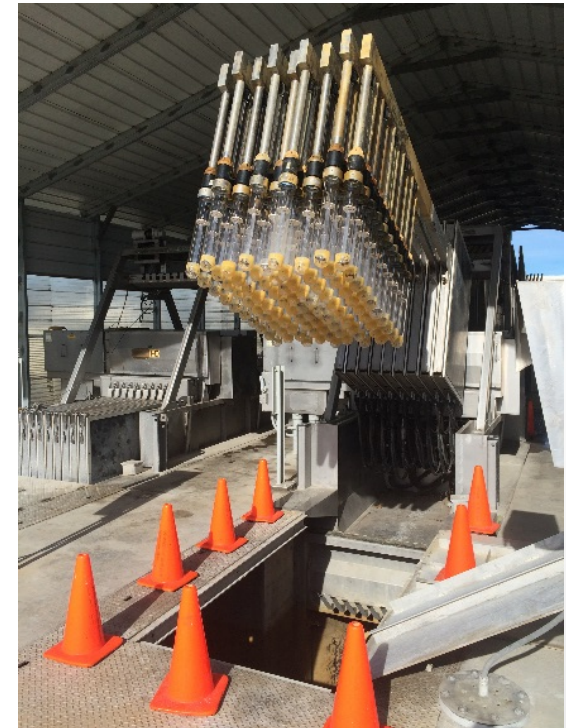
UV DISINFECTION AND DIVERSION DESIGN PROJECT

Board of Public Utilities
August 15, 2019

Mark Kasraie, PE
Supervising Engineer,
Transportation and Public Works

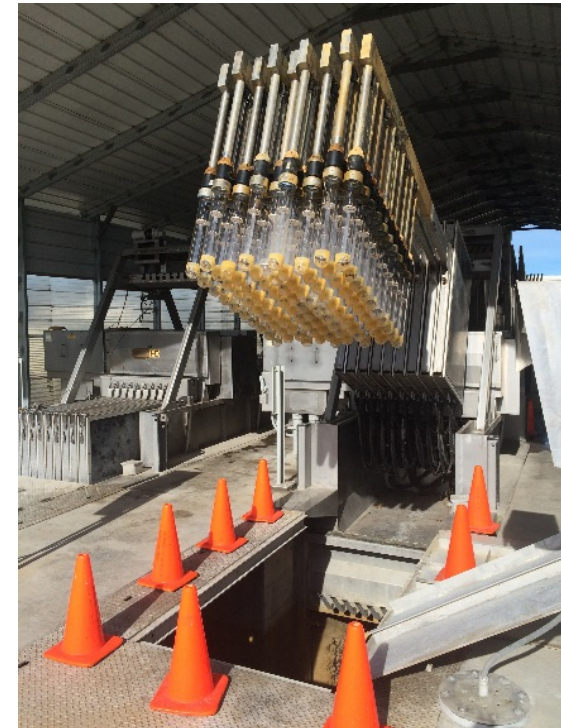
AGENDA

1. Project background
2. Overall project design, project cost, and schedule
3. Design PWO Amendment
4. Recommendation



BACKGROUND

- 1998 – Commissioned UV System (67 MGD)
- 2012 – UV System De-rated (48.5 MGD)
- 2013 – Alternatives Analysis
- 2014 – Disinfection Charrette
- 2015 – Conceptual Analyses
- 2016 – Design PWO Awarded
- 2017 – Value Engineering Study
- **PRESENT – PWO Amendment**



2013 - ALTERNATIVES ANALYSIS

- **Alternatives:**

- Ozone
- Pasteurization
- Peracetic Acid



- **Preferred Alternative:**

- UV – Most cost effective solution to addressing capacity deficiency



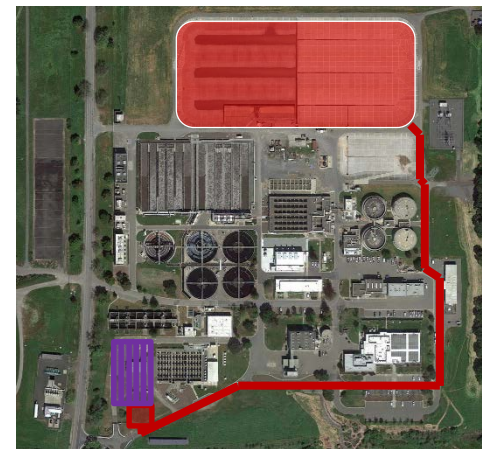
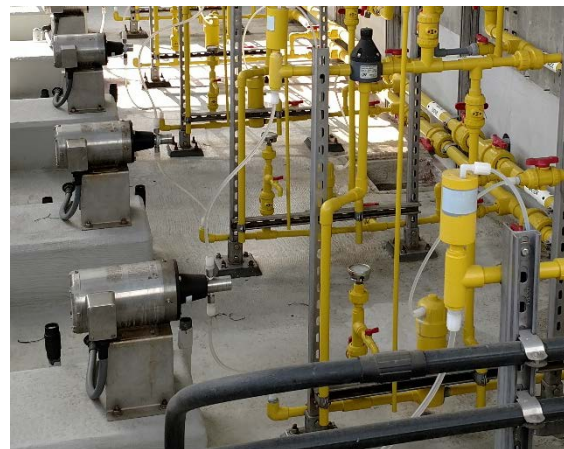
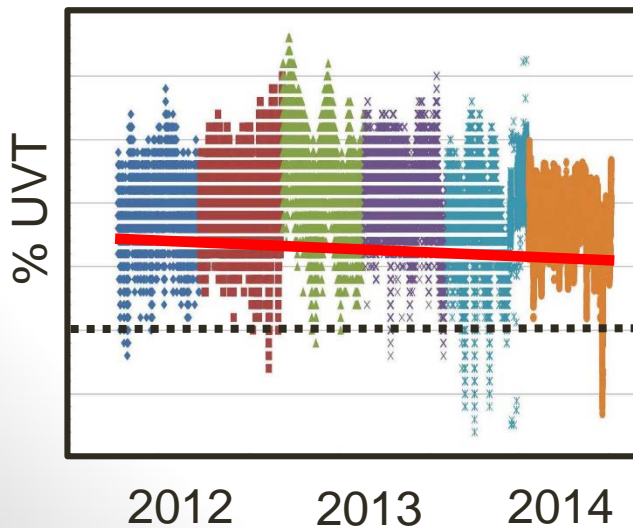
2014 - DISINFECTION CHARRETTE

- Analyzed broader perspective for UV
- More possibilities, future constraints
- Team Members
 - 6 Consultants (5 firms)
 - 11 City Staff
 - 19 Alternatives
 - 16 Parameters



2015 – CONCEPTUAL ANALYSES

- TM 1 – Trends in Ultraviolet Transmittance
- TM 2 – Feasibility of Geysers Hypochlorite Disinfection
- TM 3 – Diversion Improvements
- TM 4 – UV System Design Parameters



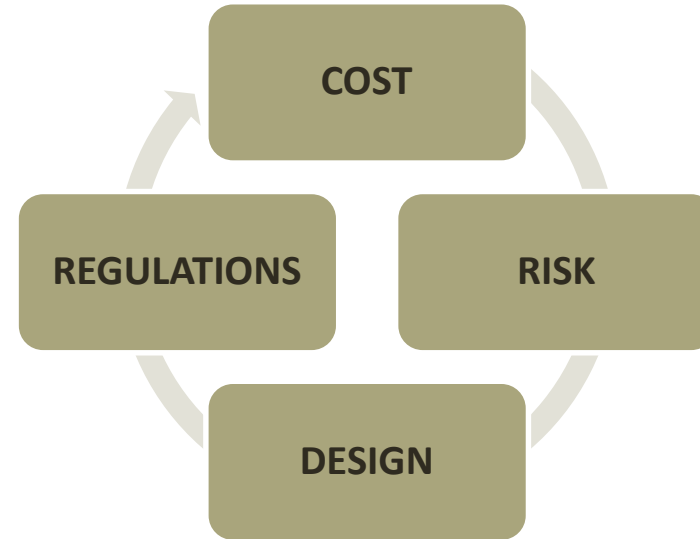
2016 – DESIGN

- **Original \$2.8M Design PWO:**
 - UV
 - Hypochlorite
 - Diversion
- **Preselected UV Equipment Supplier:**
 - Selected Calgon Carbon
 - Executed a PSA and MOU Agreement
 - Secured pricing for 18 months



2017 – VALUE ENGINEERING STUDY

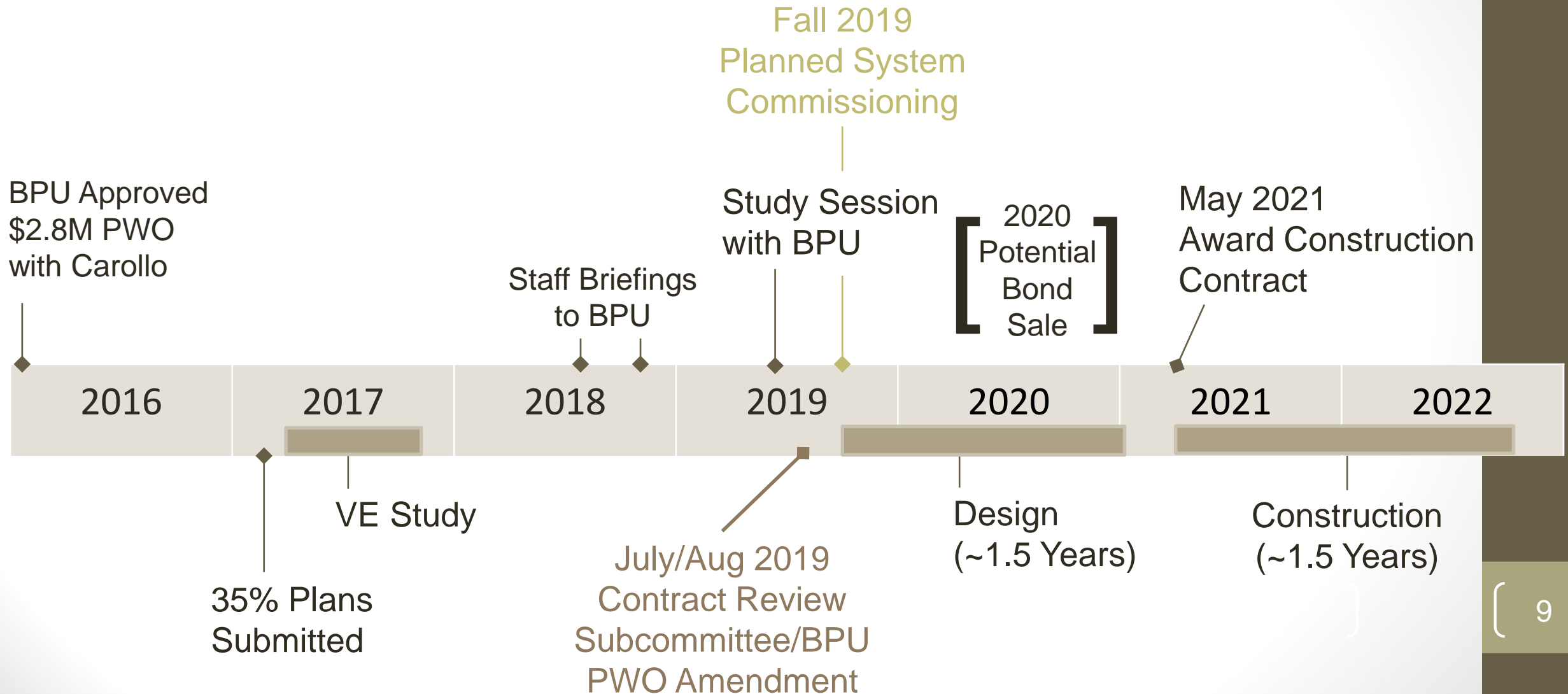
- Revisited Alternatives

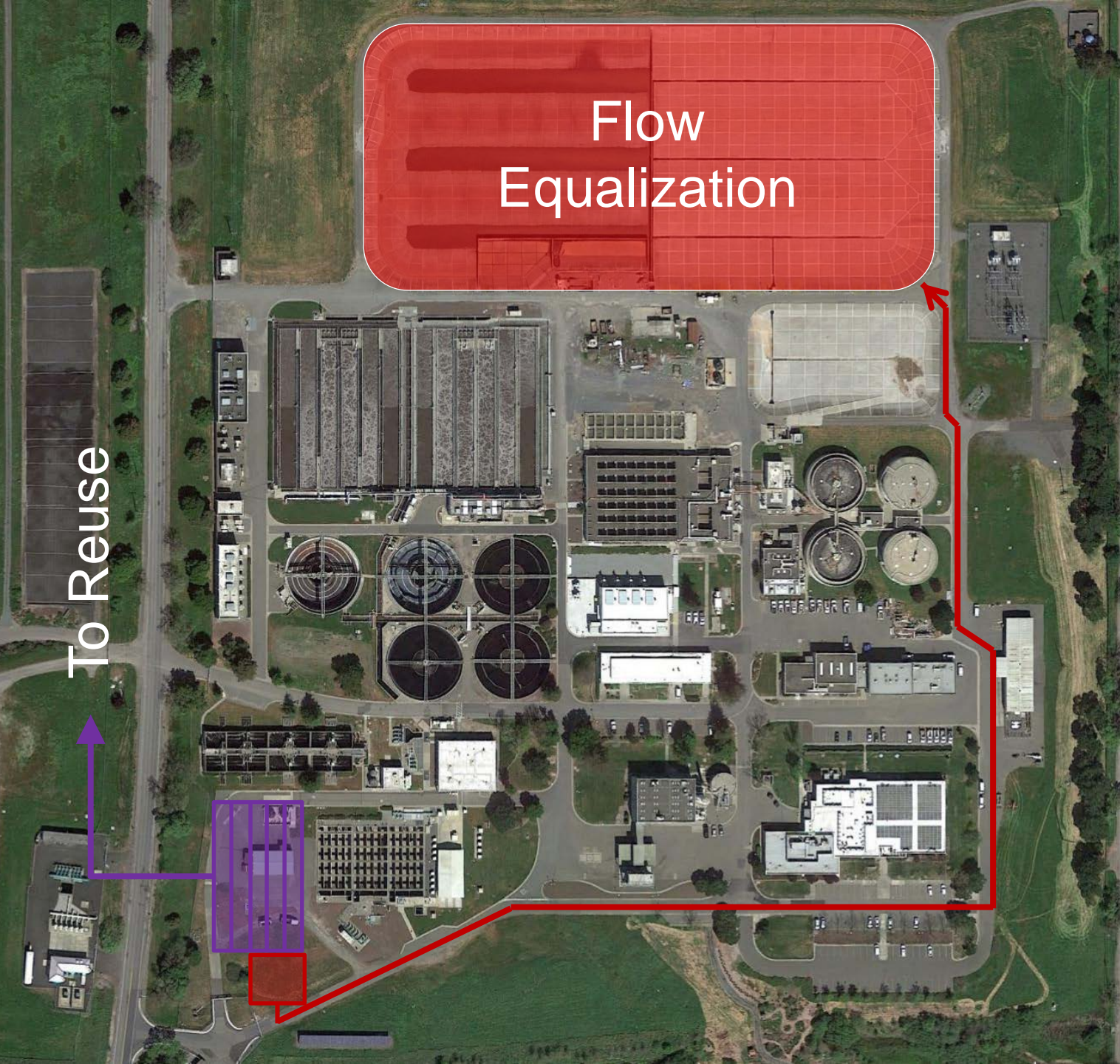


- **Conclusion:**

- Confirmed UV supplemented with hypo, and diversion was most effective approach
- Revised design parameters reducing capital cost for UV replacement

PROJECT TIMELINE





Flow
Equalization

DESIGN LAYOUT

Ultraviolet
Disinfection
System

On-Site Diversion
System with
Pipeline

To Reuse

ESTIMATED PROJECT COSTS

UV Disinfection	\$35M
Diversion	\$12M
Total Construction Cost	\$47M
Project Delivery Costs ⁽¹⁾	\$17M
Total Estimated Project Cost	\$64M

(1) Project Delivery Cost represents 35% of Total Construction Cost, and Includes: Design, ESDC, CM/Inspection, Fees, and Overall Contingency

PWO AMENDMENT

Original (\$)	Amendment (\$)	Total (\$)
2.8M	1.6M	4.4M

1. Increased project management and pre-design tasks by \$300,000
2. Increased UV/diversion design tasks by \$800,000
3. Increased contingency by \$200,000

PWO AMENDMENT - RATIONALE

1. Extended project schedule by over 3 years
2. Performed VE Study and supplemental assessments
3. Expanded design scope to address issues found at the early design stage
4. Increased labor rates by 10% to bring 2015 rates to current rates

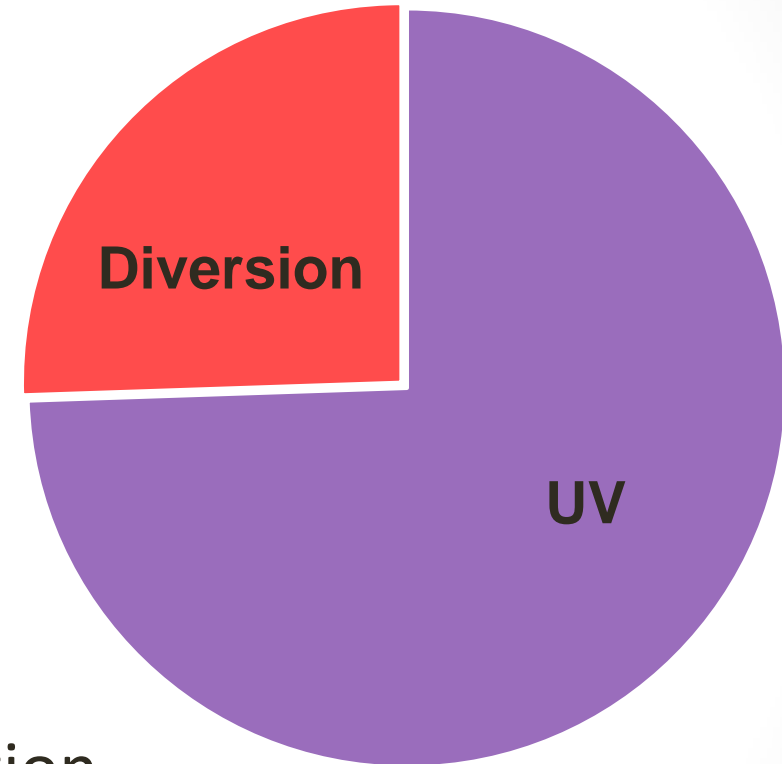
DESIGN FEE ANALYSIS

Construction Costs:

UV	\$35M
Diversion	\$12M
Total	\$47M

Design Fee:

- \$4,388,254 (9.3% of Construction)
- Industry standard 8% - 12% of Construction
- 15,000 Hours:
 - Engineering Design, Preliminary Analysis, Field Investigations, Equipment Procurement Process, Commissioning, O&M Training



IMMEDIATE SYSTEM CONCERNS

- UV system does not have sufficient capacity during periods of high flow and low UVT
- Costly recirculation of non-compliant effluent
- Regional Board request for compliance schedule
- System does not have sufficient redundancy
- Increased resources/cost to maintain aging system
- Greater risk of equipment supplier ending support

ANTICIPATED TIMELINE

- October 2019 – Progress workshop
- December 2019 – Workshop with UV Vendor, Calgon
- April 2020 – 75% Design workshop
- October 2020 – 90% Design workshop
- May 2021 – Award Construction Contract, CM/Inspection Contract, and Amend Design PWO for ESDC

RECOMMENDATION

- It is recommended by the Santa Rosa Transportation and Public Works Department and the Contract Review Subcommittee, that the Board of Public Utilities, by motion, approve Amendment No. 1 to Project Work Order No. A010014-2011-09 under the Master Professional Services Agreement with Carollo Engineers, Inc. of Walnut Creek to provide Professional Engineering Services for the Laguna Treatment Plant Disinfection Improvements Project in the amount of \$1,384,655, and approve a \$200,000 contingency, for a total contract amount not to exceed \$4,388,254.
- Questions?