



ROBERTSON - BRYAN, Inc.
Solutions for Progress



PACIFIC ECORISK

CVCWA TOXICITY SPECIAL PROJECT- BUILDING A MORE COMPLETE PICTURE TO INFORM POLICY AND COMPLIANCE

May 15, 2019



CVCWA

Central Valley Clean Water Association





1. CVCWA Phase I Toxicity Study

Phase I Study Key Findings
Phase I Study Recommendations



2. SWRCB Toxicity Provisions: CVCWA Advocacy

PRESENTATION OUTLINE

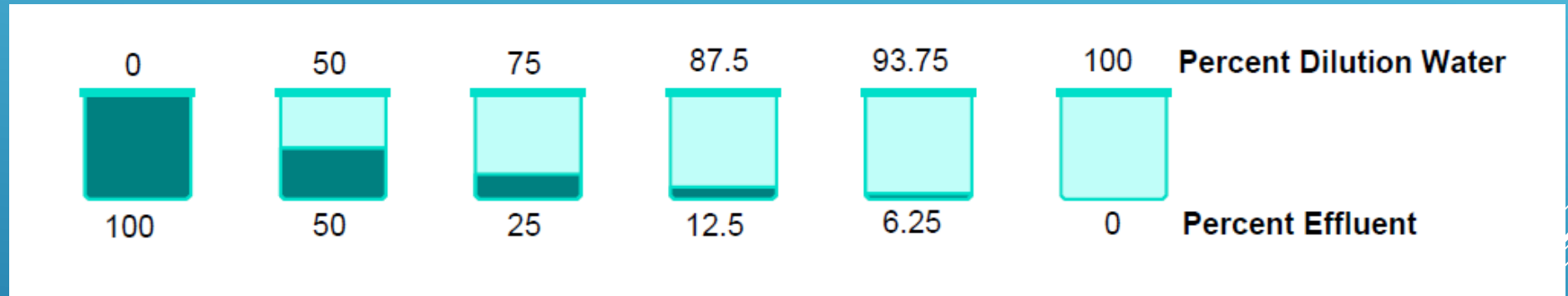
- Effect is the difference between the effluent sample and control



QUICK REVIEW – “PERCENT EFFECT”

Photo Credit: Culture Collection of Algae the University of Göttingen, Germany

- ▶ $TU_c = 100/NOEC$
- ▶ **NOEC = No Observed Effect Concentration** (first dilution in the series where there is no statistically-significant difference between that sample and the control)



Picture Credit: USEPA NPDES Permit Writer's Manual

QUICK REVIEW - CHRONIC TOXICITY UNITS (TU_c)

Frequency of low-level chronic toxicity trigger exceedances in Central Valley POTW effluents (2011-2017)

Efficacy of TREs and TIEs in resolving toxicity in effluents

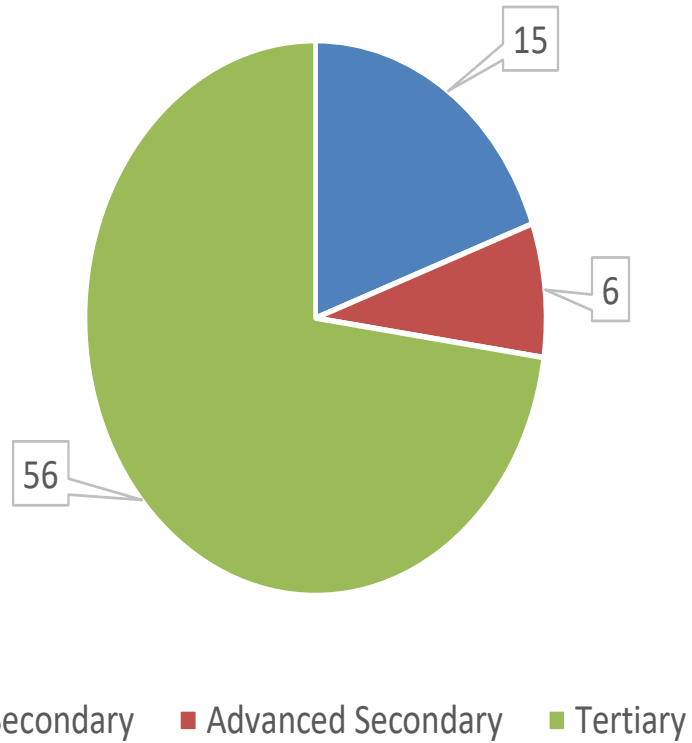
Measures to reduce variability in testing for sub-lethal endpoints

Correlation of effluent toxicity results to effects in receiving water

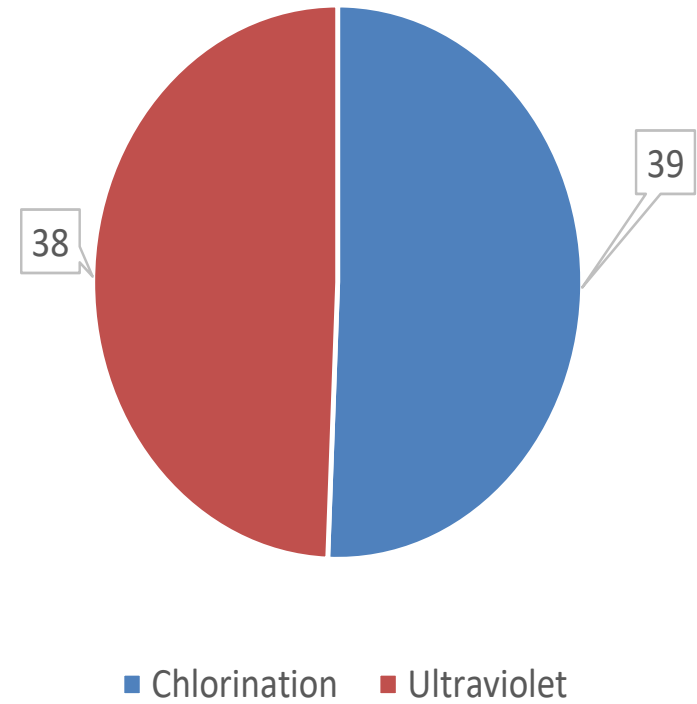
PURPOSE AND GOALS OF CVCWA PHASE I STUDY

Several thin, white, parallel diagonal lines are positioned in the bottom right corner of the slide, extending from the bottom edge towards the right edge.

Treatment Level



Disinfection



CENTRAL VALLEY POTWS

Results for 66 of 77 Central Valley POTWs

Results for High-end POTWs with chronic toxicity trigger = 1 TU_c

- ***Ceriodaphnia* reproduction and *Selenastrum* growth resulted in 87% of all trigger exceedances (2011-2017)**
 - ***Ceriodaphnia* – 1 in 6 tests (16%)**
 - ***Selanastrum* – 1 in 11 tests (9%)**
 - **Other - 1 in 75 tests (1.3%)**

PHASE I STUDY KEY FINDINGS

- ▶ **Toxicity Reduction Evaluations (35 completed TREs reviewed)**
 - ▶ Majority of TREs that were resolved: Treatment facility or Collection System issues
 - ▶ ~25% of TREs ended without identification of cause of toxicity.
 - ▶ TIE testing was conducted in 12 TREs: in only two cases did TIE testing lead to the conclusion of the TRE

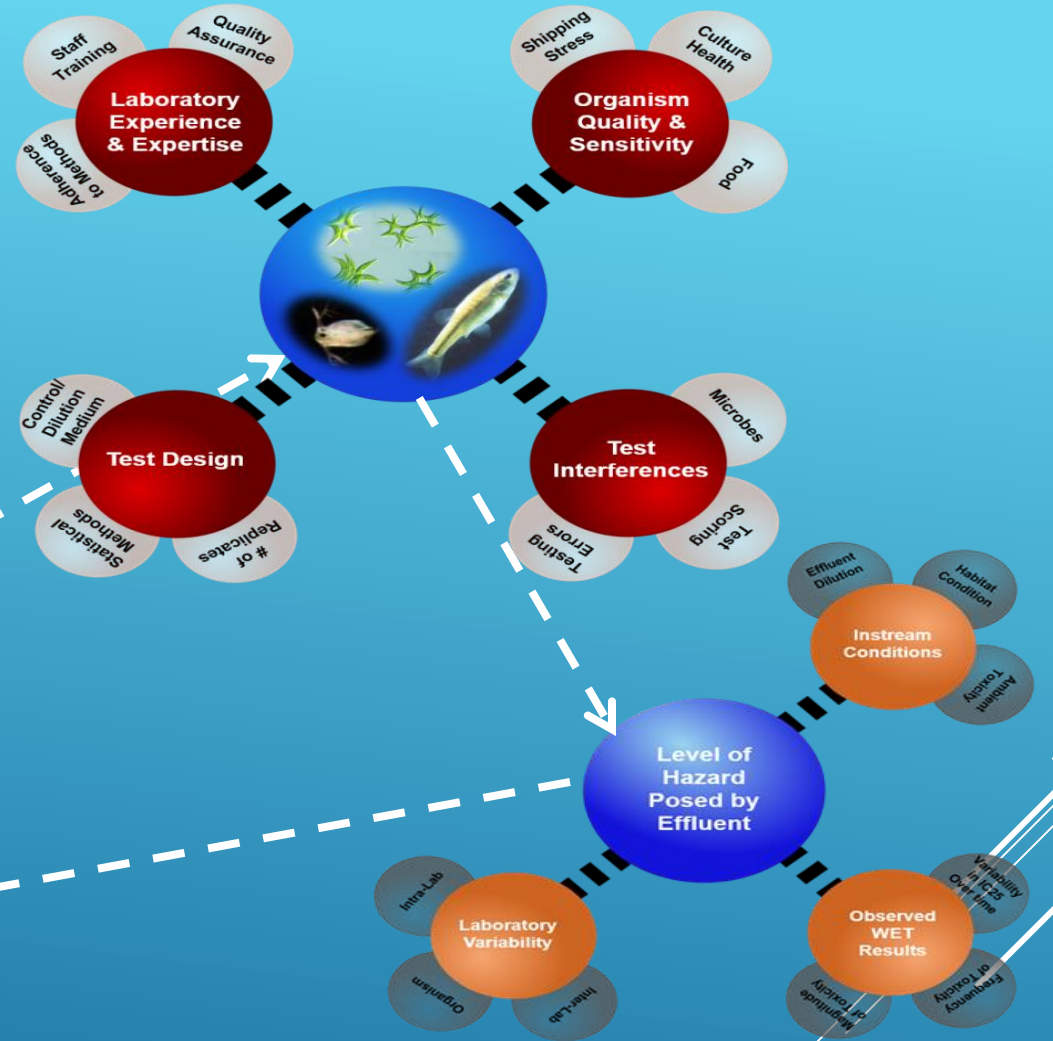
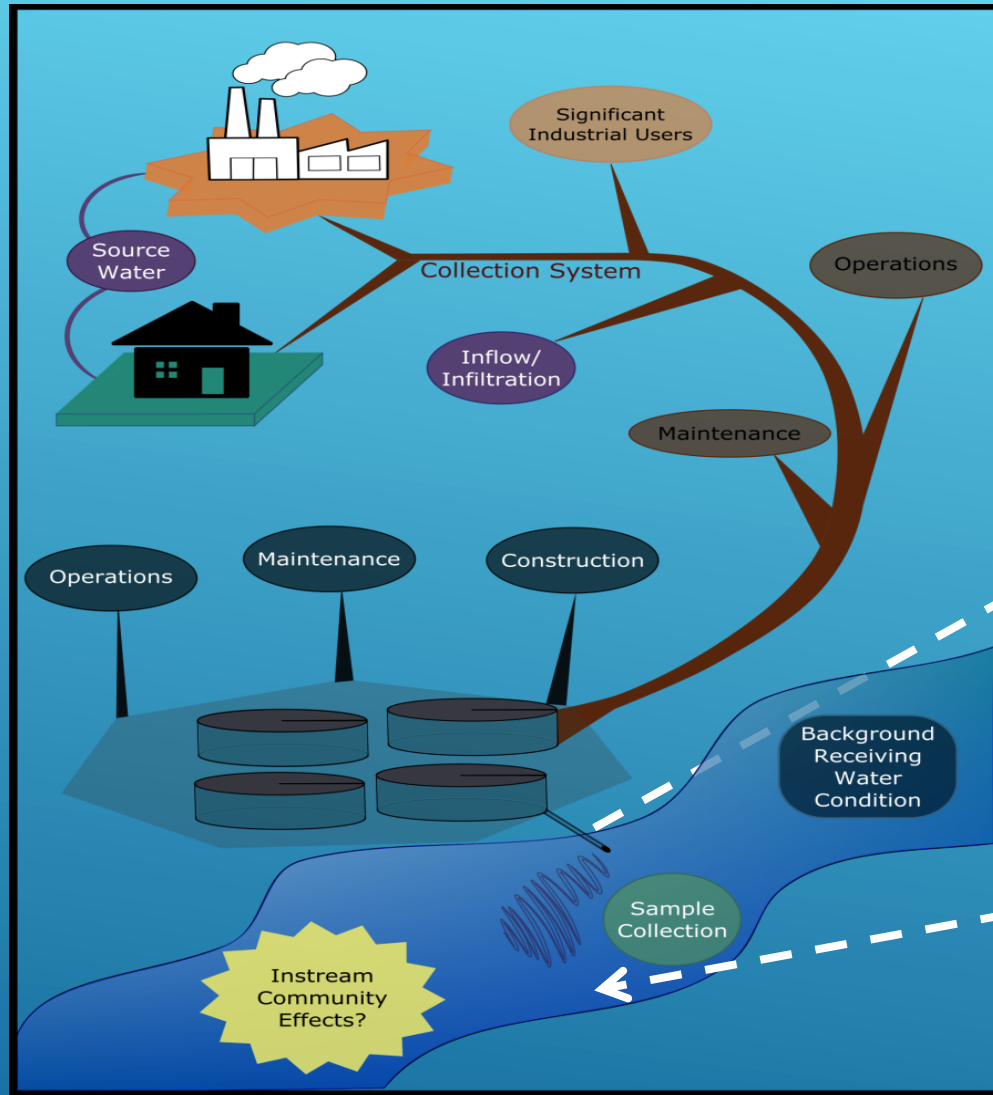
PHASE I STUDY KEY FINDINGS (CONT.)

Appendix A in Phase 1 Report

- ▶ Chronic Freshwater Toxicity Testing:
Standard Test Condition Sheets
- ▶ Chronic Toxicity Report Review
Checklists

KEY DELIVERABLE:
RECOMMENDED
PRACTICES TO
ADDRESS
VARIABILITY

Several thin, white, parallel diagonal lines are positioned in the bottom right corner of the slide, extending from the right edge towards the center.



KEY DELIVERABLE: DRAFT CONCEPTUAL MODEL

1. Toxicity test failure rate is greater than 25 %.
2. Effluent flow is more than 80 percent of the receiving stream flow

or

Effluent dilution in receiving water has been properly accounted for.

3. Downstream ambient toxicity testing indicates toxicity.
4. WET tests results are not related to inter-laboratory variability.
5. Inter-test variability over time is low and toxicity is routinely present (persistent).



CRITERIA IN EVALUATING LEVEL OF HAZARD TO INSTREAM ECOLOGY – LITERATURE REVIEW

PHASE I STUDY RECOMMENDATIONS

- ▶ Work with Regional Board to identify and evaluate additional methods:
 - ▶ In-stream waste concentration (IWC) determination
 - ▶ Receiving water bioassessment and/or toxicity testing
- ▶ Strengthen TRE process
- ▶ Participate in *Ceriodaphnia dubia* studies

- ▶ **Most sensitive species testing only**
- ▶ **Numeric Effluent limitations – TST compliance determination**
 - ▶ **Max daily limit: percent effect < 50 percent**
 - ▶ **Median monthly limit: no more than one test may fail in a calendar month at instream waste concentration (IWC)**
- ▶ **More frequent Monitoring**
 - ▶ **POTWs $\geq$ 5 mgd → monthly testing**
 - ▶ **POTWs < 5 mgd → reasonable potential analysis + quarterly testing**
- ▶ **Two or more exceedances of effluent limitations → initiate TRE**

PROPOSED STATEWIDE TOXICITY POLICY (SWRCB)



CVCWA ADVOCACY TO SWRCB

- ▶ Reasonable Potential Determination
 - ▶ 25% versus 10% effect
- ▶ IWC flexibility for Regional Boards
 - ▶ More options than SIP steady state approach
- ▶ *Ceriodaphnia* reproduction
 - ▶ Need study to address variability
 - ▶ Interim approach given issues with this test
- ▶ Species Sensitivity Screening
- ▶ Monitoring Requirements

QUESTIONS?

Thank you