Chlorine Residual Basin Plan Amendment Project

BACWA Annual Meeting

01/19/2018

What is the Problem?

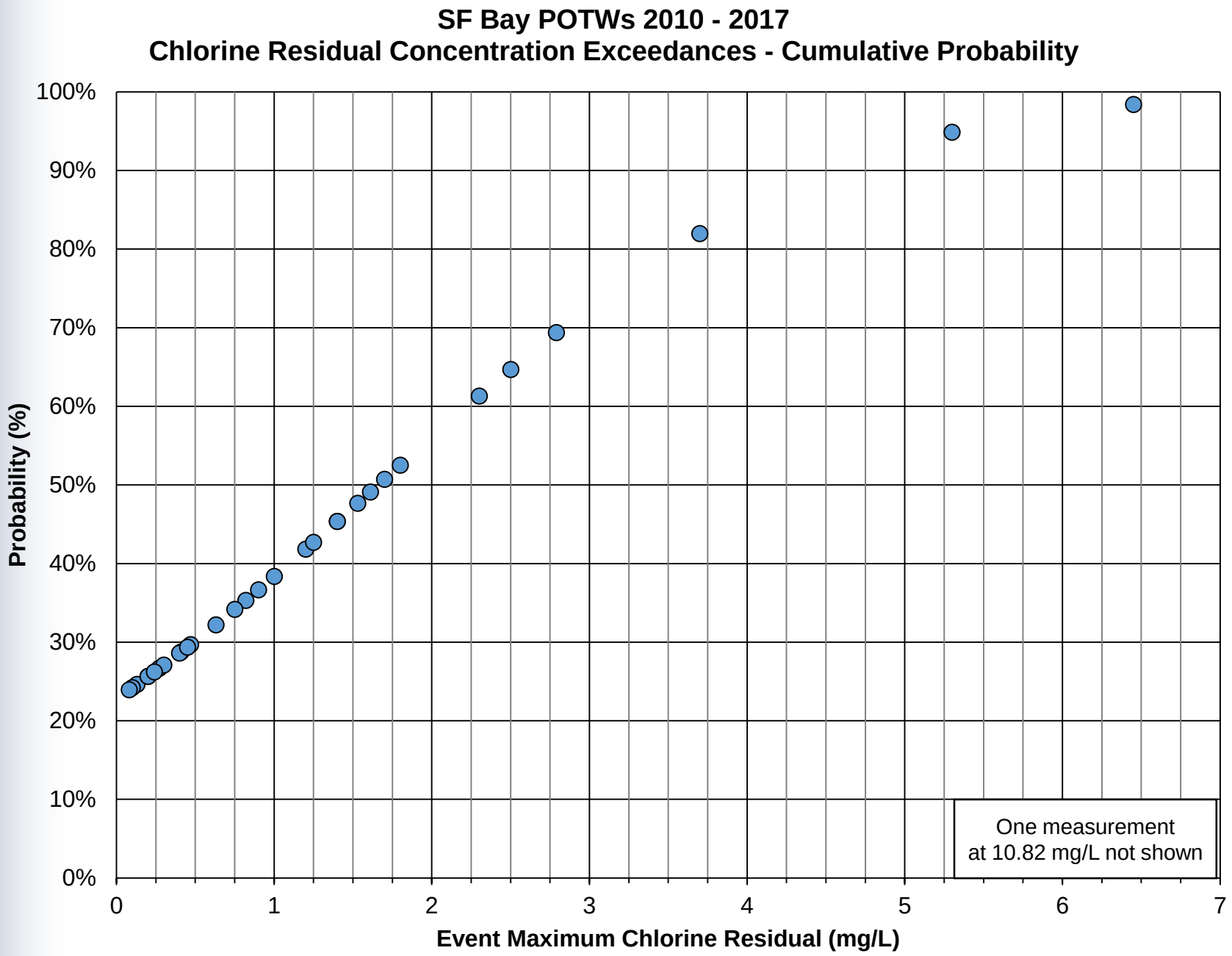
- Basin Plan 0.0 mg/L chlorine residual effluent limit
- Historic technology/performance based limit
- Expressed as an instantaneous maximum limit
- Continuous monitoring required (“stuff” happens)
- Mandatory minimum penalty (MMP) for each excursion
  - Any measured concentration
  - Any measured duration
  - MMP minimum $3,000/excursion
  - No RWB enforcement discretion

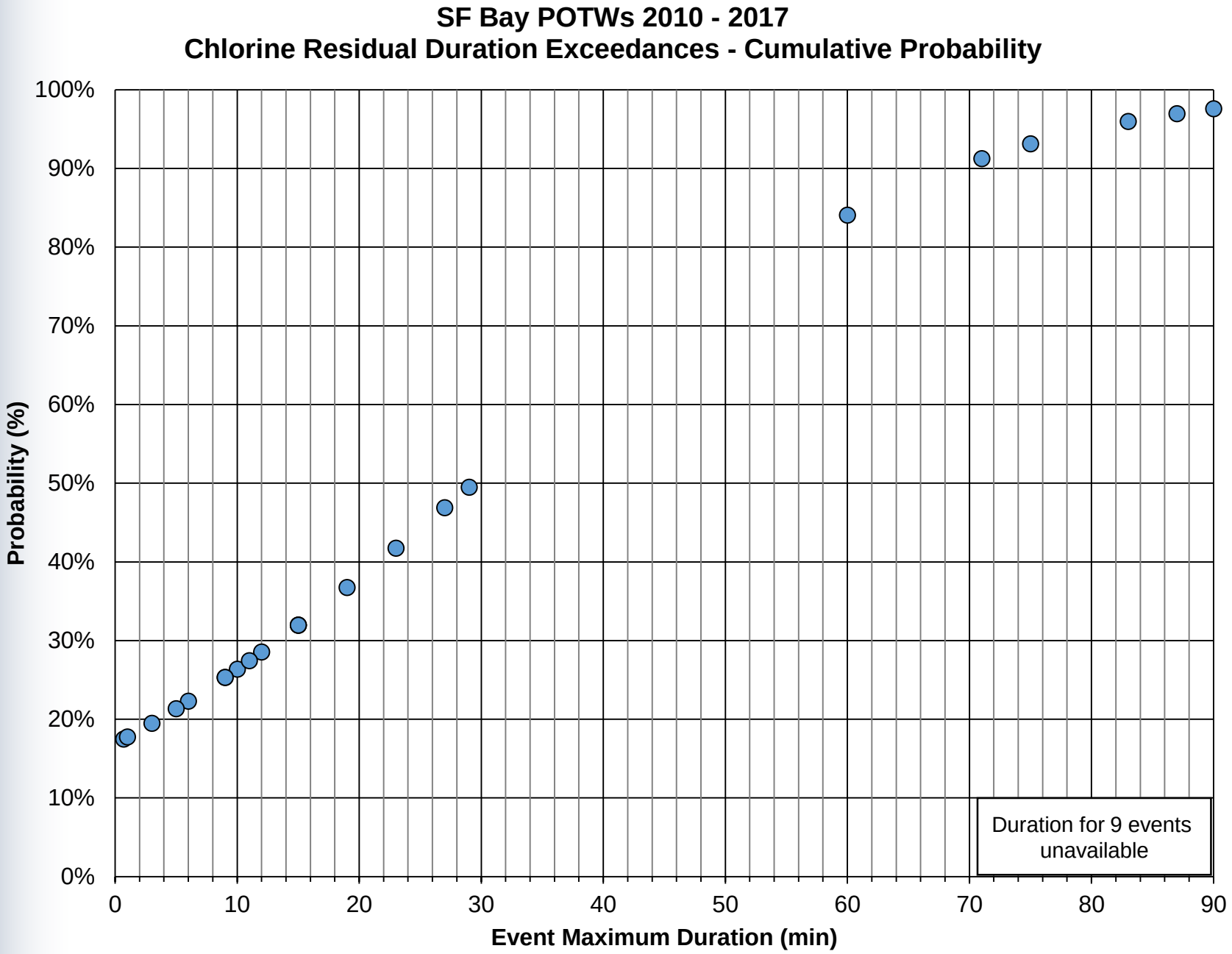
Recent Compliance Status

- Continuous monitoring - interim compliance approach
  - POTWs report 24 every hour on the hour readings daily (MMPs)
  - Per RWB/BACWA 2004 letter agreement
  - Some permits require narrative off hour excursion reporting
- CIWQS query 01/01/2010 – 12/31/2017 (8 years)
  - **32 reported Cl2 excursions**
  - 2017 = 2, 2016 = 2, 2015 = 1, 2014 = 5, 2013 = 4, 2012 = 9, 2011 = 3, 2010 = 6

Excursion Statistics

- 0.001% Cl2 excursions by SF Bay POTWs
  - 24 compliance measurements/day x 365 days/yr x 40 POTWs
  - 350,400 potential violations/yr x 8 yrs = 2,803,200 PV
  - 32 excursions in 8 yrs/2,803,200 PV = 0.001%
- 2 POTWs w/6 excursions; 3 w/3; 2 w/2; 7 w/1
- Average concentration = 1.66 mg/L
- Average duration = 29.4 minutes


SF Bay POTWs 2010 - 2017
Chlorine Residual Concentration Exceedances - Cumulative Probability
Probability (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
1
2
3
4
5
6
7
Event Maximum Chlorine Residual (mg/L)
One measurement
at 10.82 mg/L not shown


SF Bay POTWs 2010 - 2017
Chlorine Residual Duration Exceedances - Cumulative Probability
Probability (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
10
20
30
40
50
60
70
80
90
Event Maximum Duration (min)
Duration for 9 events unavailable

Why So Few Excursions?

- Dechlorination chemical added to quench Cl2 residual
- **Over-dosing required for consistent compliance**
- Excess bisulfite creates oxygen demand in RW
- Bay-wide about 3 MG of sodium bisulfite used annually
- Bay-wide annual (2017) total bisulfite costs about $3.5 M
  - Amount of over-dosing unknown (10-30%?; 2-4 mg/L?)
  - 20% over-dosing reduction = ~$0.7 M/yr cost saving
  - BACWA to survey bisulfate usage and over-dosing protocols

BACWA Proposed CL2 Approach

- Delete 0.0 mg/L limit in Basin Plan Table 4-2
- Replace with 1985 EPA Ambient Water Quality Criteria
  - Saltwater: **13 ug/L as 1-hour average WQC**
  - Freshwater: **19 ug/L 1-hour average WQC**
- Use WQC to calculate new water quality based effluent limits (WQBEL) for POTW NPDES permits
- Use existing SIP methods for WQBEL calculations

Deepwater vs Shallow Water POTWs

- Deepwater discharger WQBELs
  - Cl2 non-conservative like ammonia and cyanide
  - Calculate Cl2 limits similar to ammonia using actual dilution
  - If use actual dilution of ~25:1 to 80:1 = **0.33- 1.0 mg/L limits**
  - May want to update old dilution studies
- Shallow water discharger WQBELS
  - If use cyanide based dilution (~3:1) = **~0.04 mg/L limits**
  - Need to develop new Cl2 Reporting Level (RL) (~0.1-0.3 mg/L?)
  - Not done before in CA; no standard protocols
  - May need POTW field study to develop reasonable RLs

Compliance Determination

- How to calculate compliance with 1-hour average limit?
  - Need new compliance determination definition for permits
  - Retain on the hour instantaneous result reporting?
  - Use average of 12 5-minute results?
- Current permits continuous pH monitoring language
  - Requires 99% of time compliance (< 7 hours and 26 min/mo)
  - No individual excursion beyond 60 minutes
- Santa Ana RWB uses 99% of time approach for Cl2
  - No individual excursion shall exceed 5 minutes
  - No individual excursion shall exceed 5.0 mg/L

Basin Plan Amendment

- BACWA to provide technical support to RWB for BPA
  - Technical and data analysis, BPA staff report, CEQA
  - RL development may be critical path issue
  - Relatively minor text changes needed to Basin Plan
- RWB, SWB, OAL, and EPA approvals (~24+ months)
- Project underway now!

Contact Information

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