

NACWA Case Study — 3/26/2009 10:45am-12:00pm

Tomorrow's Source Control for Today's Emerging Pollutants



Division 640, Source Control
Orange County Sanitation District, California



**Introduction
To Drivers
~15 min**

**Pollutant
Prioritization
~15 min**

**Source
Identification
~15 min**

**Outreach
Programs
~15 min**

**Closing
Remarks &
Questions
~15 min**

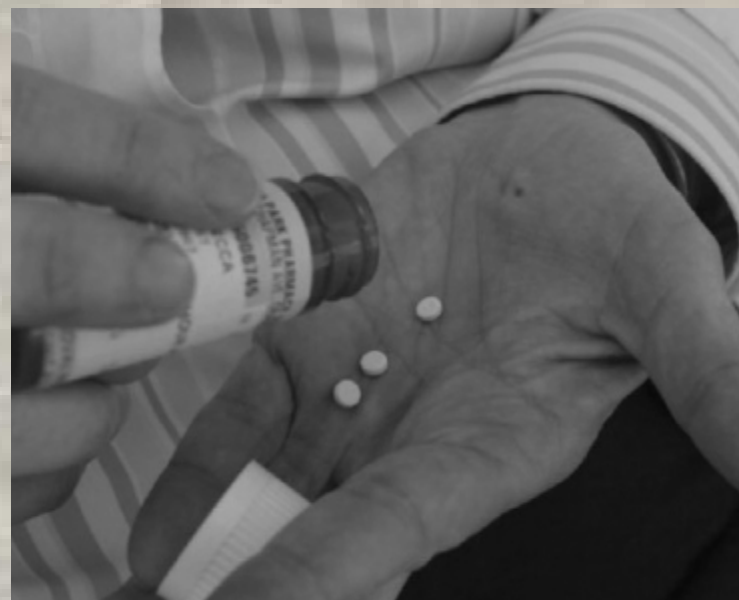
Monday, February 16, 2009

Police: Don't flush drugs unless you want to drink them

Huntington Beach police launch prescription medication disposal service to encourage residents not to flush or throw away pharmaceuticals.

By JAIMEE LYNN FLETCHER
The Orange County Register

HUNTINGTON BEACH— Police are urging residents to properly dispose of their medications to combat the effects of throwing prescription drugs in the trash or flushing them down the toilet.

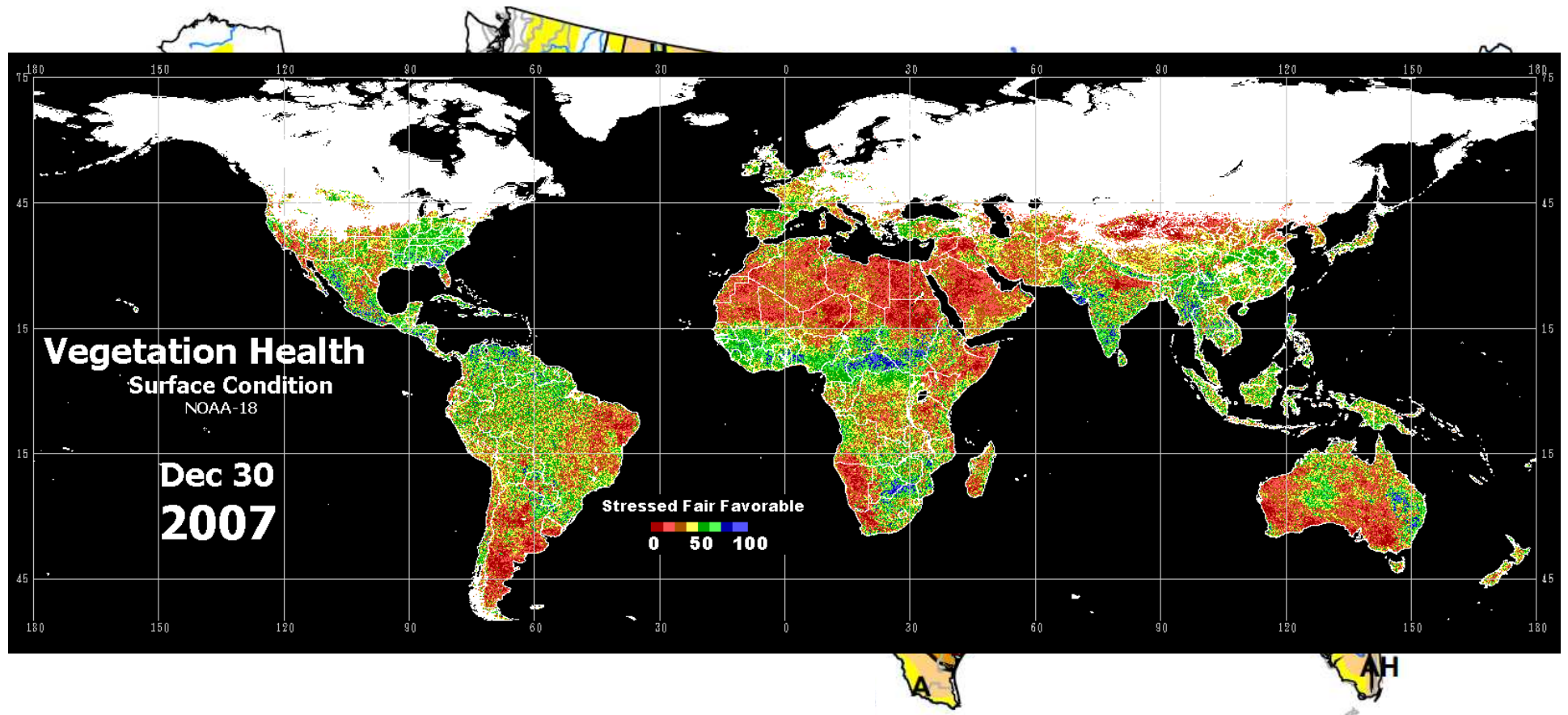


Huntington Beach police are launching a prescription medication disposal service to encourage residents not to flush or throw away pharmaceuticals.

THE ORANGE COUNTY REGISTER, BY
JEBB HARRIS



The Drought: Not Just a Regional Problem...



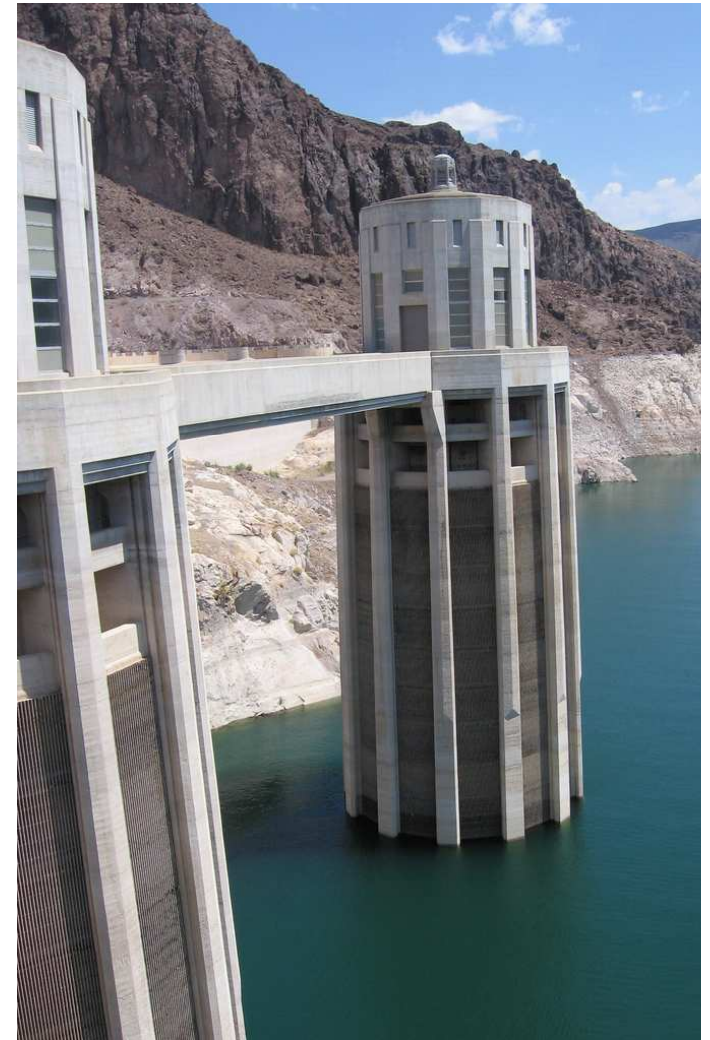
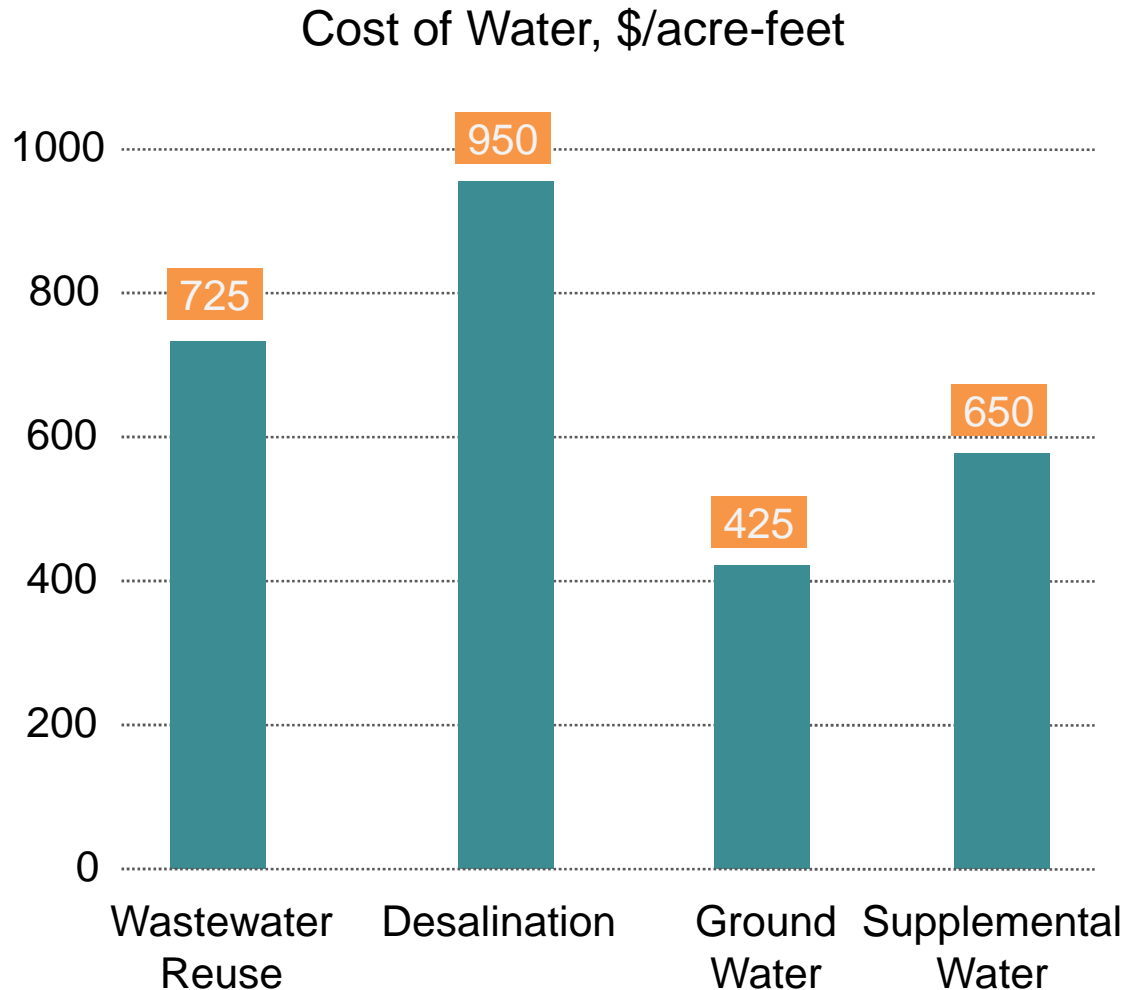
NOAA/NESDIS/Weather Service, Earth Applications, 2009 Current Vegetation Health Image Maps

Drought Shapes New Thoughts

“ It is hereby declared that the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state. ”

Section 13510 from the California Water Code (CWC) Division 7, Chapter 7, or Water Recycling Law

Tomorrow's Thoughts: Diversified Water Portfolio



1. 2006-2007 Engineer's Report on Groundwater Conditions, Water Supply, and Basin Utilization in the Orange County Water District
2. Poseidon Desalination Project, San Diego

A photograph of a large industrial building, identified by the text on its facade as a Groundwater Replenishment System. In the background, a large, white, cylindrical water storage tank is visible, equipped with various pipes and a metal access structure. The building's facade is light-colored with a grid-like pattern. The foreground shows some green foliage. Overlaid on the image are two lines of text: '70 million gallons per day' and '500 thousand people'.

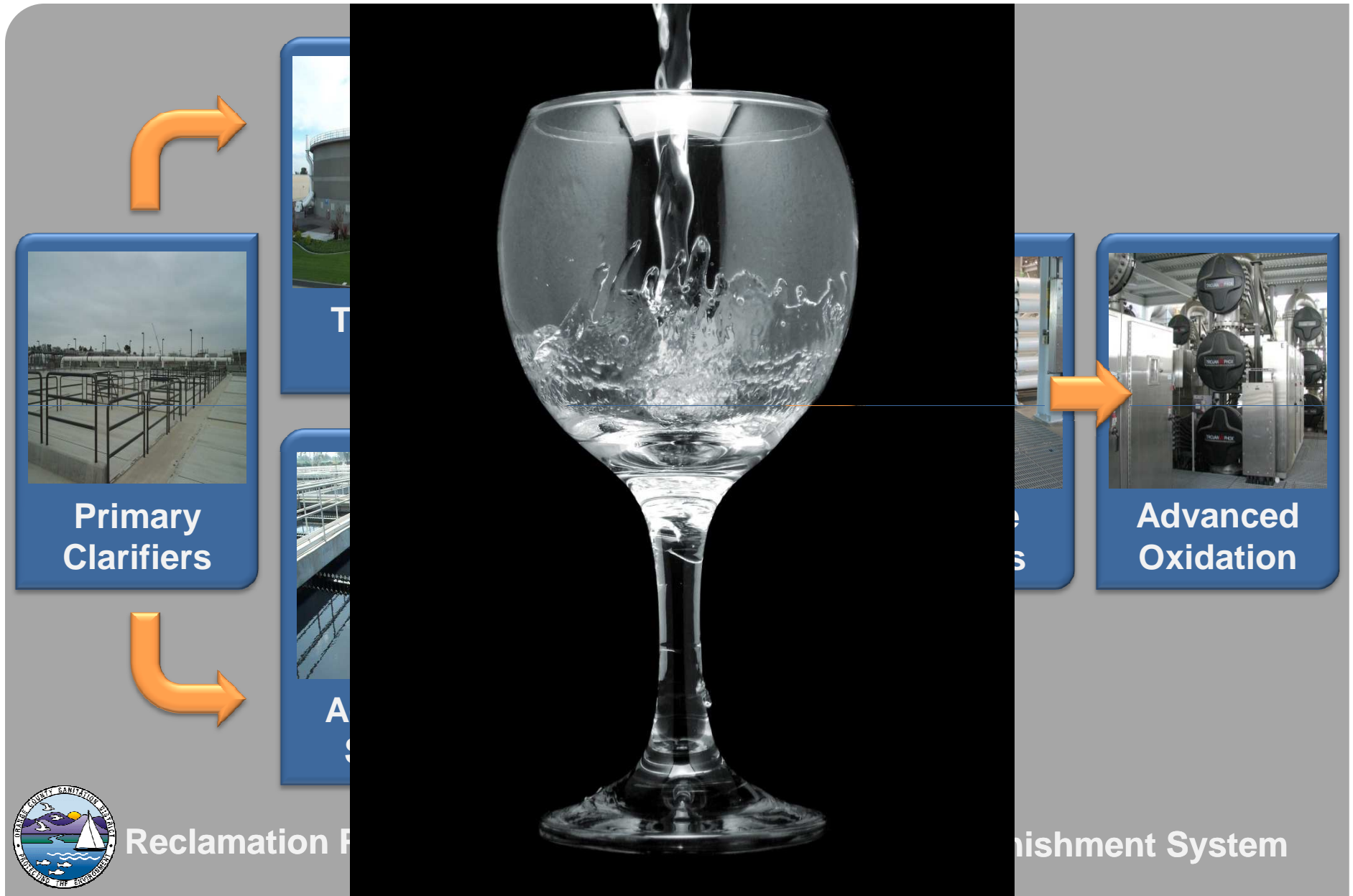
70 million gallons per day

500 thousand people

OCWD-OCSD Joint Campus



How the Process Works



Regulatory Considerations

“ Once ground water is contaminated, making it clean enough to drink can be extremely difficult for several reasons...” ”

EPA on Ground Water Cleanup at Superfund Sites, December 1996

Regulatory Drivers

**California Department of Public Health
California Code of Regulations Title 22**

**Regional Water Quality Control Board
Order No. R8-2004-0002**

OCWD/OCSD Joint Powers Agreement

“Fate of” Assessment of Department Specified Contaminants

Source Investigation and Contaminant Monitoring of Department Specified Contaminants

Outreach Program to Industrial, Commercial, and Residential Communities

Up-to-date Inventory of Contaminants Discharged



**California Department of Public Health
Title 22 Draft Groundwater Recharge Reuse**

Expand Source Control to Include Constituents Which May Be Harmful to Human Health and Drinking Water Supplies

OCWD/OCSD Contractual Requirement for Expanded Source Control Program

CDPH May Specify Constituents for Source Control



Regional Water Quality Control Board
Order No. R8-2004-0002
Producer/User Water Recycling Requirements

Comprehensive Source Control Program to control discharges that could adversely affect the GWR System



OCWD/OCSD Joint Exercise of Powers Industrial Pretreatment & Pollution Source Control Program

NISC GWRS-EPOC Programs

Program Driver

I(a)(2)(A)

Pollutant Prioritization, Phases I, II, and III

I(a)(2)(B)

Priority Pollutant Source Identification

I(a)(2)(B)

Source Control Strategy Assessment

I(a)(2)(B)

Implementation & Evaluation

I(a)(2)(A)

Routine Monitoring Evaluation of Action Levels

I(a)(2)(A)

Local Limits Evaluation Including GWRS

I(a)(2)(D)

Chemical Inventory

I(a)(2)(D)

Chemical Fact Sheets

NISC Strategy: Modular Approach

Routine Monitoring for Emerging Pollutants

Pollutant Prioritization

Sector Identification by Functional Use

Source Identification

- GIS Data Search
- Wastewater Characterization

Development / Evaluation

Pesticides

- Certification
- BMP

Coatings

- Outreach
- BMP

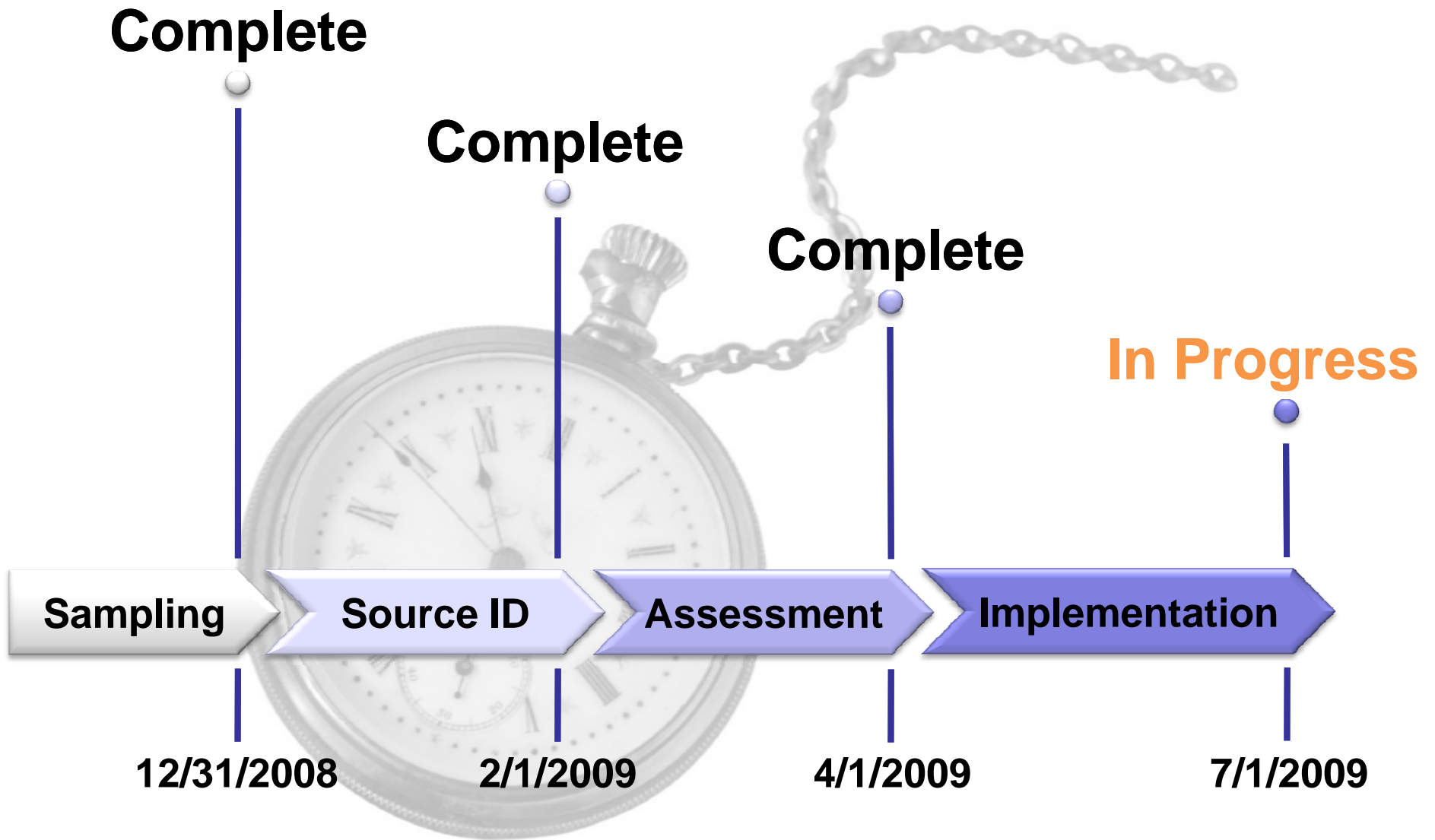
Cleaners
Degreasers

- Permit
- Inspection
- Self-Monitor

Coloring
Agents

- Outreach
- Certification

Where We Are



Recap

Wastewater is a Valuable Commodity

Source Control to safeguard water supply

Regulations dictate programs

Need a flexible modular strategy

Pollutant Prioritization



Determines what is important to **focus** resources on...

4,000 new constituents are registered on a **daily** basis

- Chemical Abstract System

Target how ratepayer \$\$\$ are **effectively** spent

Constituent List



- Primary and Secondary
- Contaminant Candidate Lists
- Maximum Contaminant Levels
- Priority Pollutants / 307(a) Toxics
- Regulatory Action Levels



Water Boards

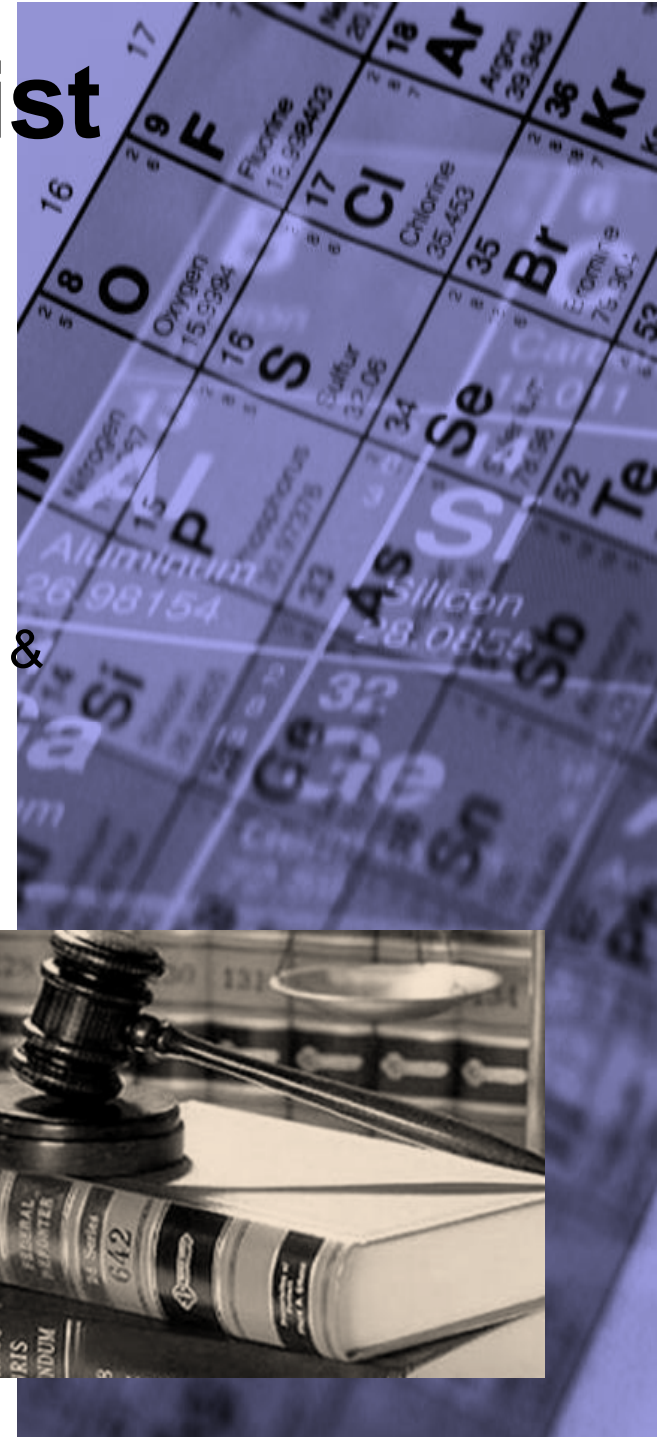
- Order No. R8-2004-002 Monitoring & Reporting Program



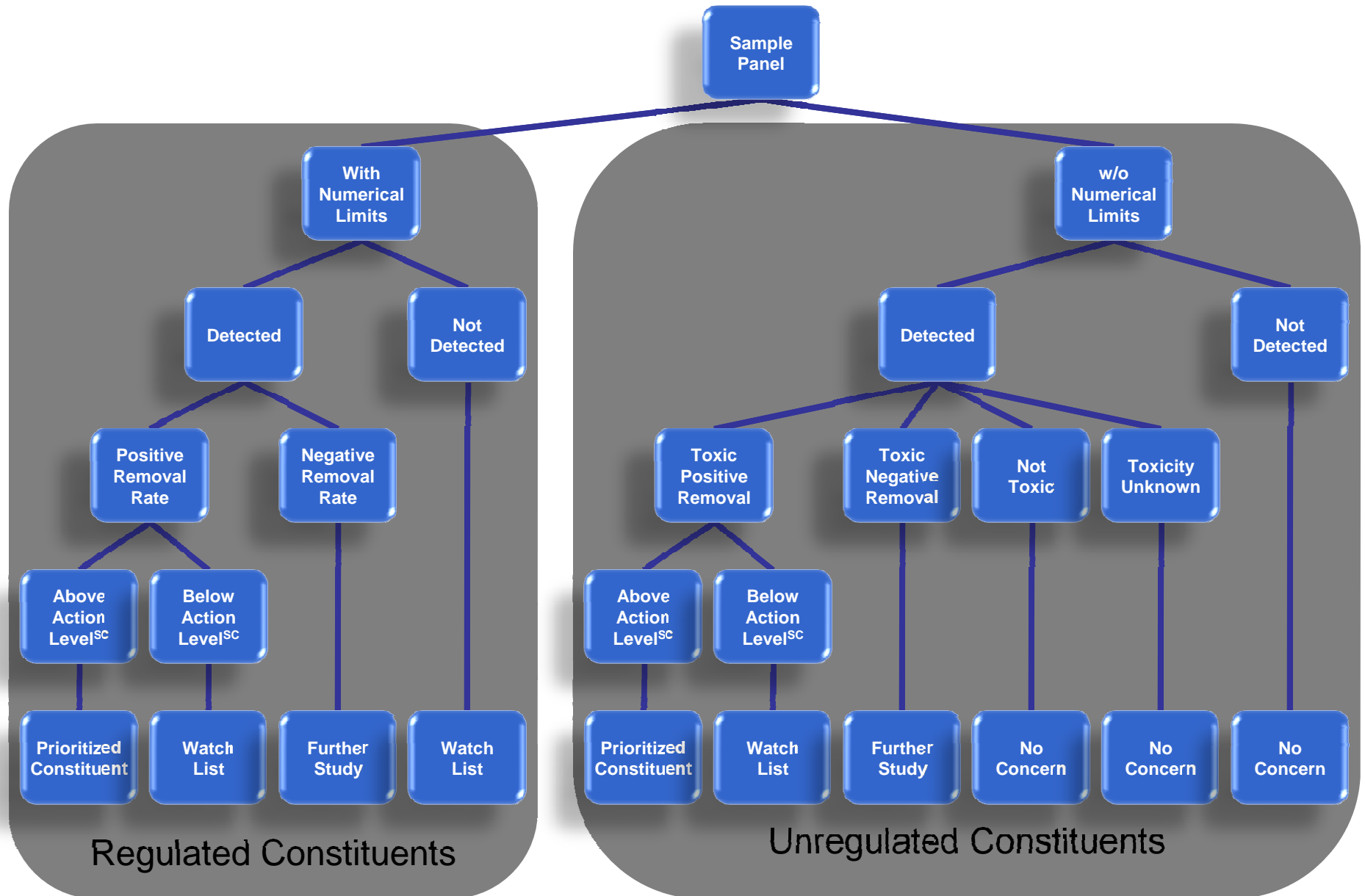
- Maximum Contaminant Level
- Archived Advisory Level
- Public Health Goals
- Notification Level
- Title 22



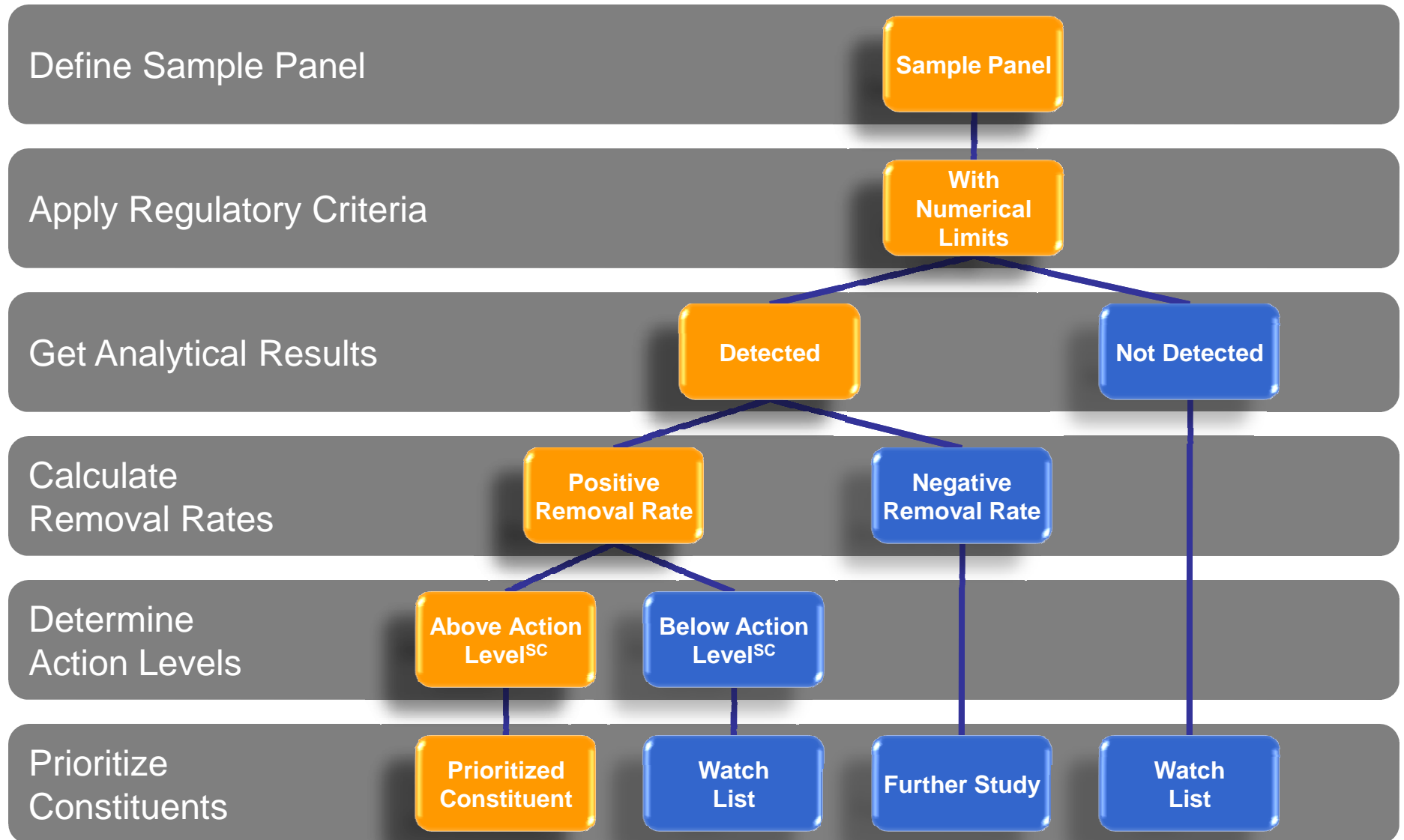
- Orange County Water District
- Orange County Sanitation District
- Local Limits
- Advisory Panel



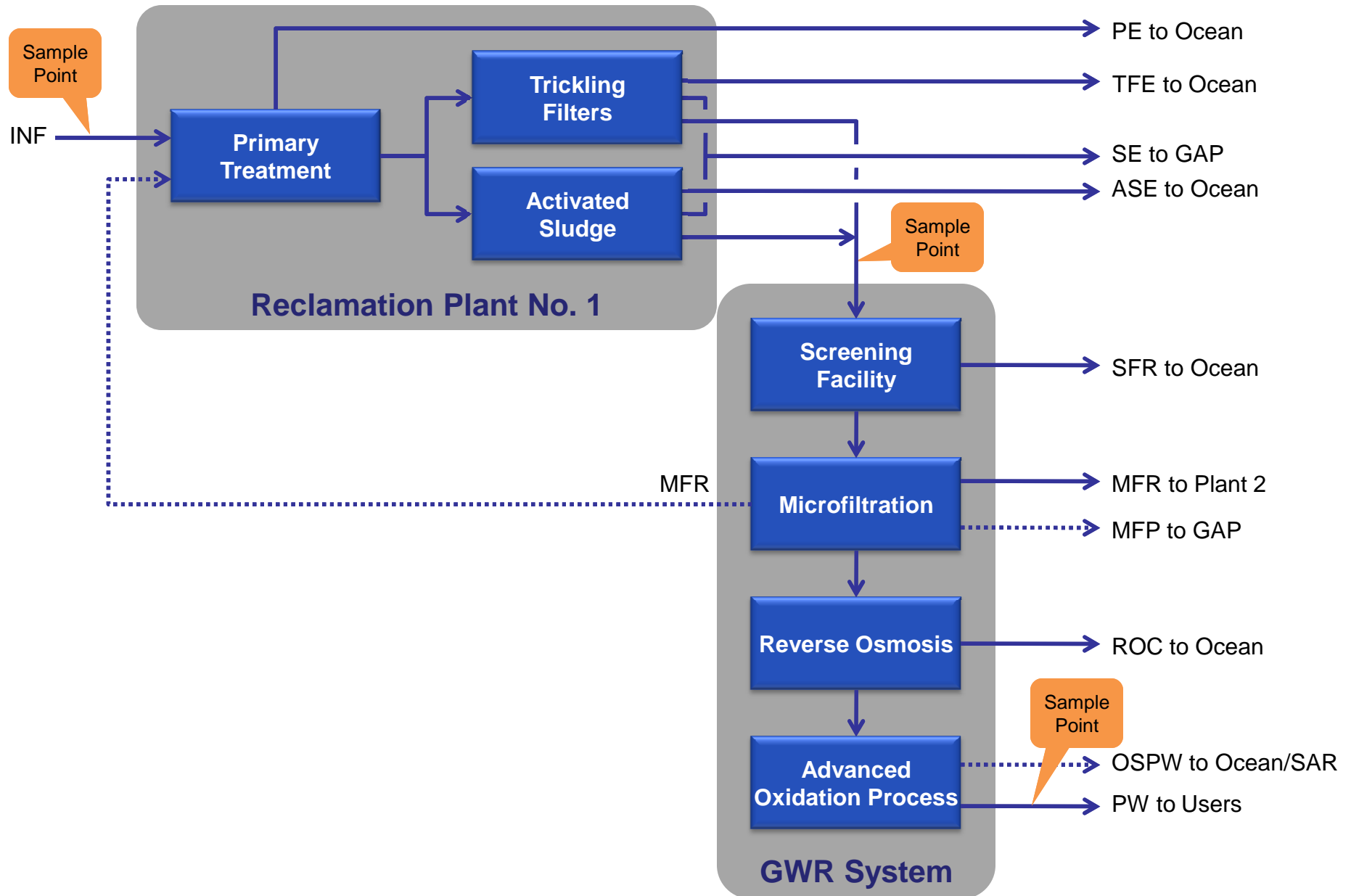
Prioritization Method



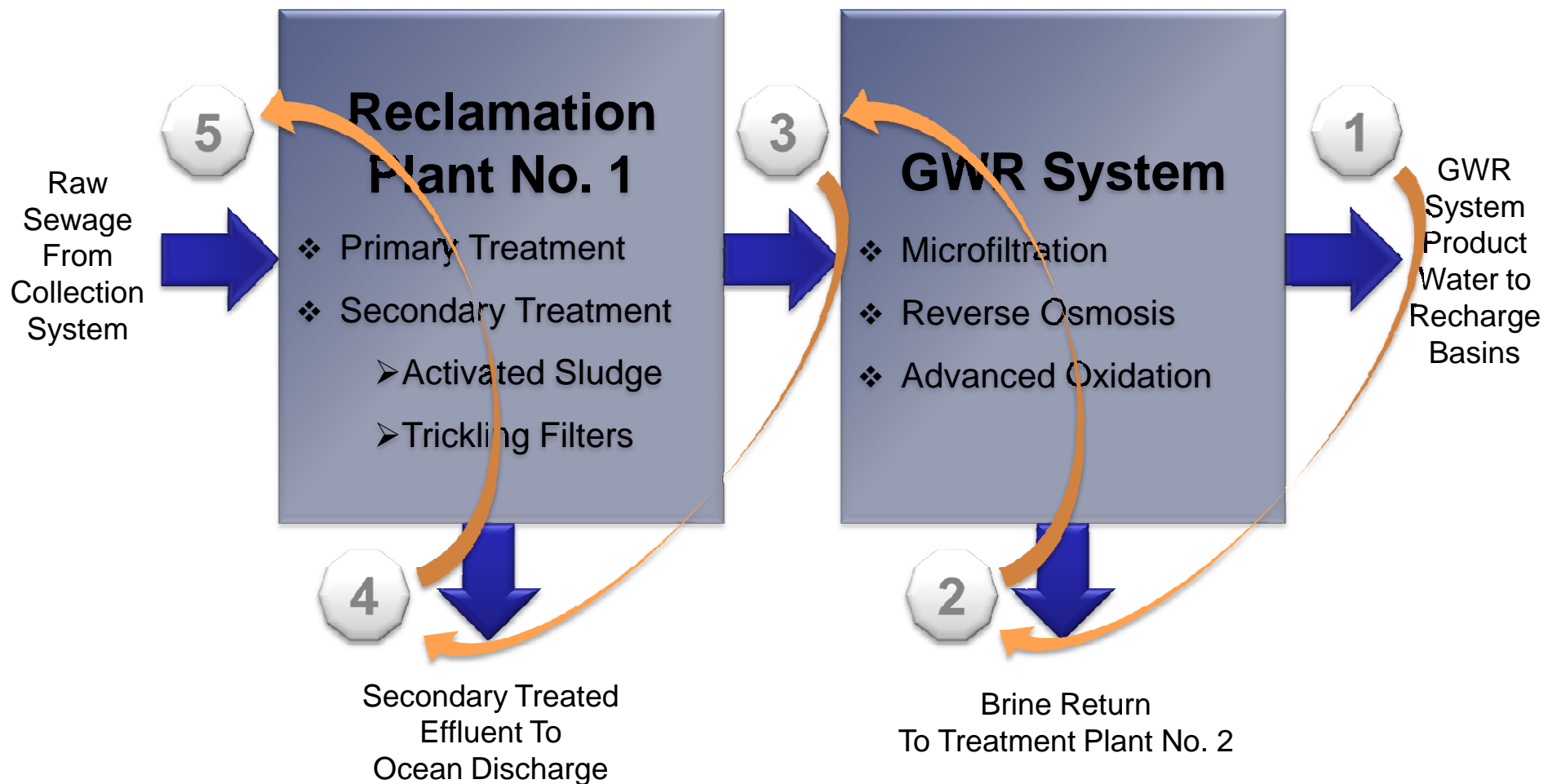
Regulated Constituents



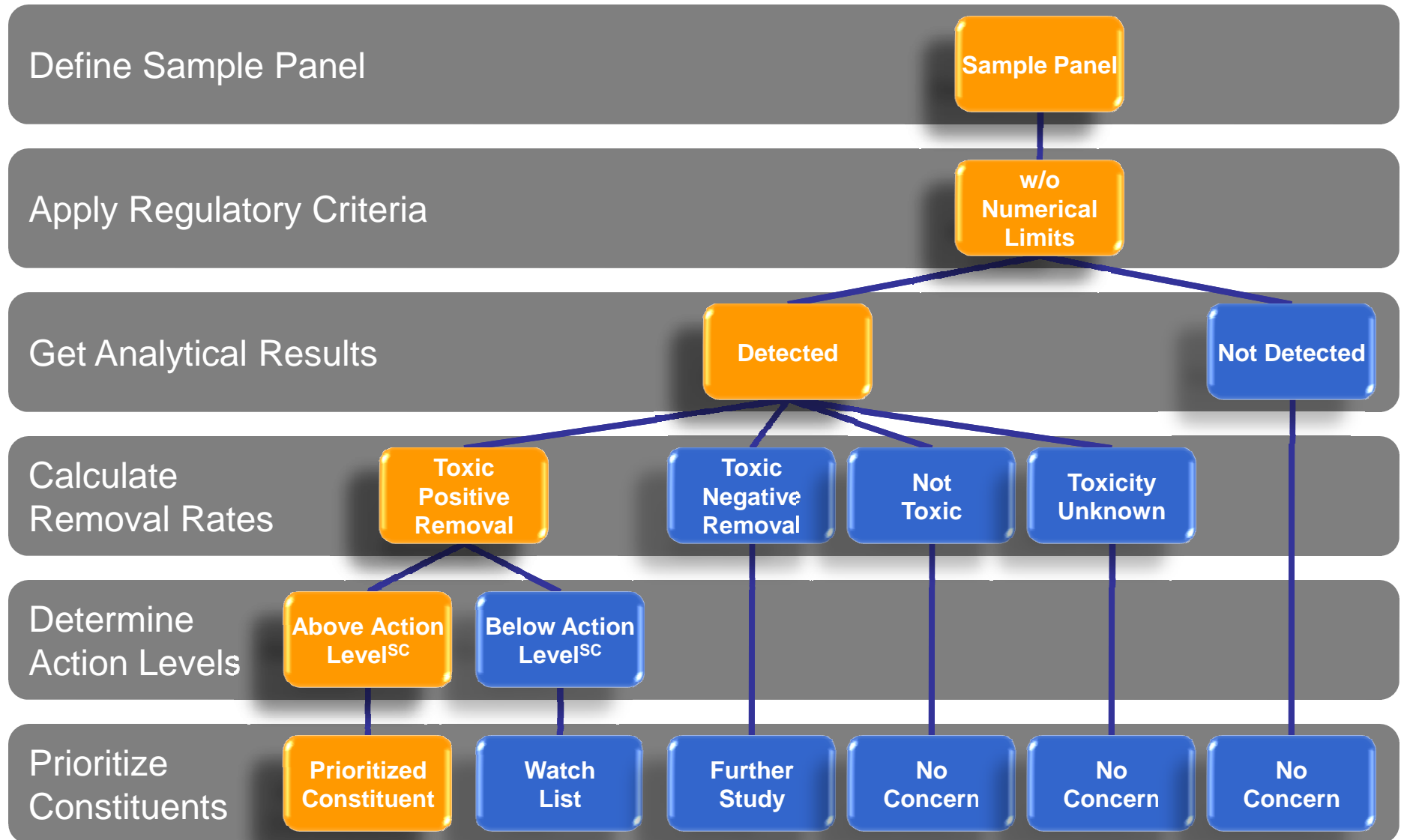
Water Side Mass Balance



Water Side Mass Balance Model



Unregulated Constituents

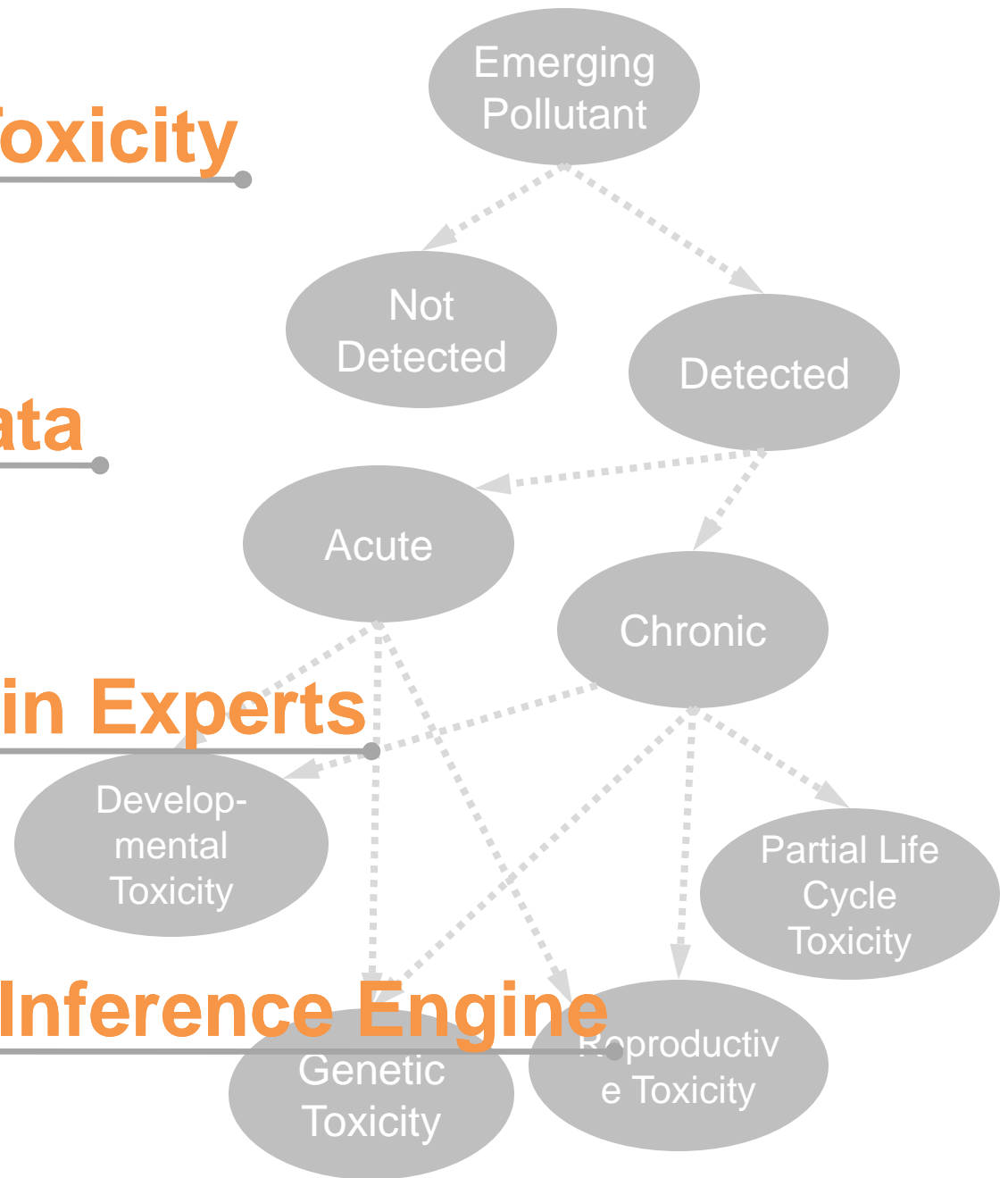


Heuristics for Toxicity

Toxicity Data

Toxicology Domain Experts

Bayesian Logic Inference Engine



Base Neutral Acid Semi-Volatiles

1,4-Dichlorobenzene
bis(2-Ethylhexyl)phthalate
2,4,6-Trichlorophenol

1,4-Dioxane & Nitrosamines

1,4-Dioxane
n-Nitrosodimethylamine
n-Nitrosomorpholine

Inorganics

Total Kjeldahl Nitrogen
Total Dissolved Solids

Volatile Organic Compounds

Methylene chloride
Tert-butyl alcohol

Aldehydes and Oxyhalides

Formaldehyde
Perchlorate

Metals

Antimony	Iron
Arsenic	Manganese
Boron	Nickel

Surrogate Indicators

Antimony
Arsenic
Boron
Iron
Manganese
Nickel
Total Kjeldahl Nitrogen
Total Dissolved Solids
bis(2-Ethylhexyl)phthalate
2,4,6-Trichlorophenol
1,4-Dioxane
n-Nitrosodimethylamine
n-Nitrosomorpholine
Formaldehyde
Perchlorate
1,4-Dichlorobenzene
Dichloromethane
tert-butyl alcohol



Commercial Subsectors by Functional Use

Disinfection Byproducts
Pesticides
Pharmaceuticals & Medicines
Cleaners & Degreasers
Coatings
Coloring Agents & Dyes
Chemical Families
Fuels, Additives & Byproducts

Recap

Systematic approach to ID constituents

Method reduced 500 to 18 constituents

Control constituents by subsectors

18 constituents are surrogate indicators

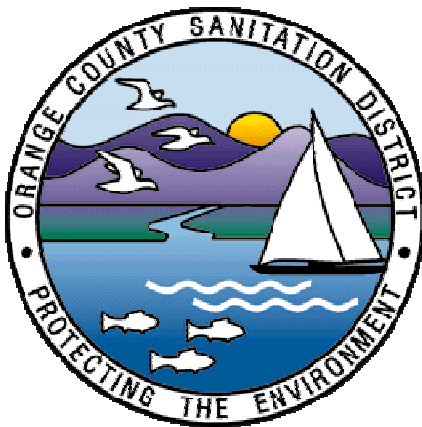
Questions?

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