POTWs and the Regulatory World Pesticides and Other Compounds

Department of Pesticide Regulations

Pesticide Registration and Evaluation Committee

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Chair, Tri-TAC

With Assistance From

East Bay Municipal Utility District

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Los Angeles County Sanitation Districts

Sanitation “Greatest Medical Milestone Since 1840"

Thursday January 18, 2007 Reuters:

Sanitation was voted the most important medical milestone in the past century and a half on Thursday in a poll conducted by a leading medical journal. Improved sewage disposal and clean water supply systems, which have reduced diseases such as cholera, was the overwhelming favorite of 11,341 people worldwide who voted in the survey conducted by the British Medical Journal. It surpassed antibiotics, the discovery of DNA, and anesthesia, which were among the top five milestones in the poll. Participants were asked what they thought was the biggest medical advance since the journal was established in 1840. "I'm delighted that sanitation is recognized by so many people as such an important milestone," said Professor Johan Mackenbach, of Erasmus University Medical Center in Rotterdam who championed the sanitation choice. "The general lesson which still holds is that passive protection against health hazards is often the best way to improve population health," he added. "Clearly, sanitation still plays a vital role in improving public health now and in the future," he said.

Overview

- Definitions
- POTWs in California
- What is Tri-TAC?
- Who Regulates POTWs?
- Wastewater treatment processes
- How pesticides reach POTWs
- Regulations governing POTWs
- Why do POTWs care about pesticides?
- Tri-TAC Success Stories
- What do we want from DPR?

Definitions

- Wastewater Treatment Plants
- Publicly Owned Treatment Works
- Collection Systems
- Clean Water Act
  - NPDES Permits
- Porter Cologne Act
  - Waste Discharge Requirements
- Reasonable Potential
- Total Maximum Daily Load (TMDL)

POTWs in California

- ~180 POTWs in California
- Collectively treat approximately 2 billion gallons of wastewater/day
- Collection point for society's waste footprint

Publicly Owned Treatment Works

Business

Environmental Steward

Provide Wastewater Collection and Treatment Services

Protect Public Health and the Beneficial Uses of Receiving Waters

What is Tri-TAC?

- Formed in the 1970s
- Goal:
  - Improve “the overall effectiveness and accountability of environmental programs that impact POTWs in California.”
- Represents POTWs via its three sponsoring organizations:
  - League of California Cities (478 cities)
  - California Association of Sanitation Agencies (115 member agencies)
  - California Water Environment Association (>8,000 members)
- Constituents include representatives from most of the sewered population in California
- Monthly Meetings – Air, Land, and Water Committees
- www.tritac.org

Who Regulates POTWs

- The Short Answer is EVERYBODY!
- A Board Member at one of the EBDA Agencies asked, “How many regulations do we have to comply with?”
- Answer: ALL OF THEM!

State and Regional Water Boards

- Statewide Polices
  - Ocean Plan
  - Enclosed Bays and Estuaries Plan
  - Water Recycling Policy
- Biosolids Waste Discharge Requirement
- Sanitary Sewer Overflow WDR
- Operator Certification
- Regional Water Boards
  - NPDES Permits
  - Enforcement

Air Resources Board and AQMDs

- Issue Permits for Diesel Engines
  - Fleet vehicles, heavy duty vehicles, emergency generators, portable engines
- Other Permits
  - Turbines, Boilers, scrubbers, odor control equipment
- Title V Permits – Facility-Wide
- Regulations for coatings and solvents
- Emission Inventories
- Air Toxic Hotspots Inventories

Office of Environmental Health Hazard Assessment

- Acute and Chronic Reference Exposure Levels
- Cancer Potency Factors – health risk assessments
- Drinking Water Public Health Goals
- All can Impact NPDES Permits

Integrated Waste Management Board

- Permit Landfills
- Recycling Goals (AB939)
- Regulation of Biosolids Disposal
- Compost Regulations

Department of Toxic Substances Control

- Hazardous Waste Regulations
  - Disposal of some POTW wastes
- Electronic Waste
- Manifest Reporting

Department of Health Services

- Sanitary Sewer Overflow Reporting
- Maximum Contaminant Levels
- Recycled Water Regulations
- Laboratory Accreditation

Department of Industrial Relations

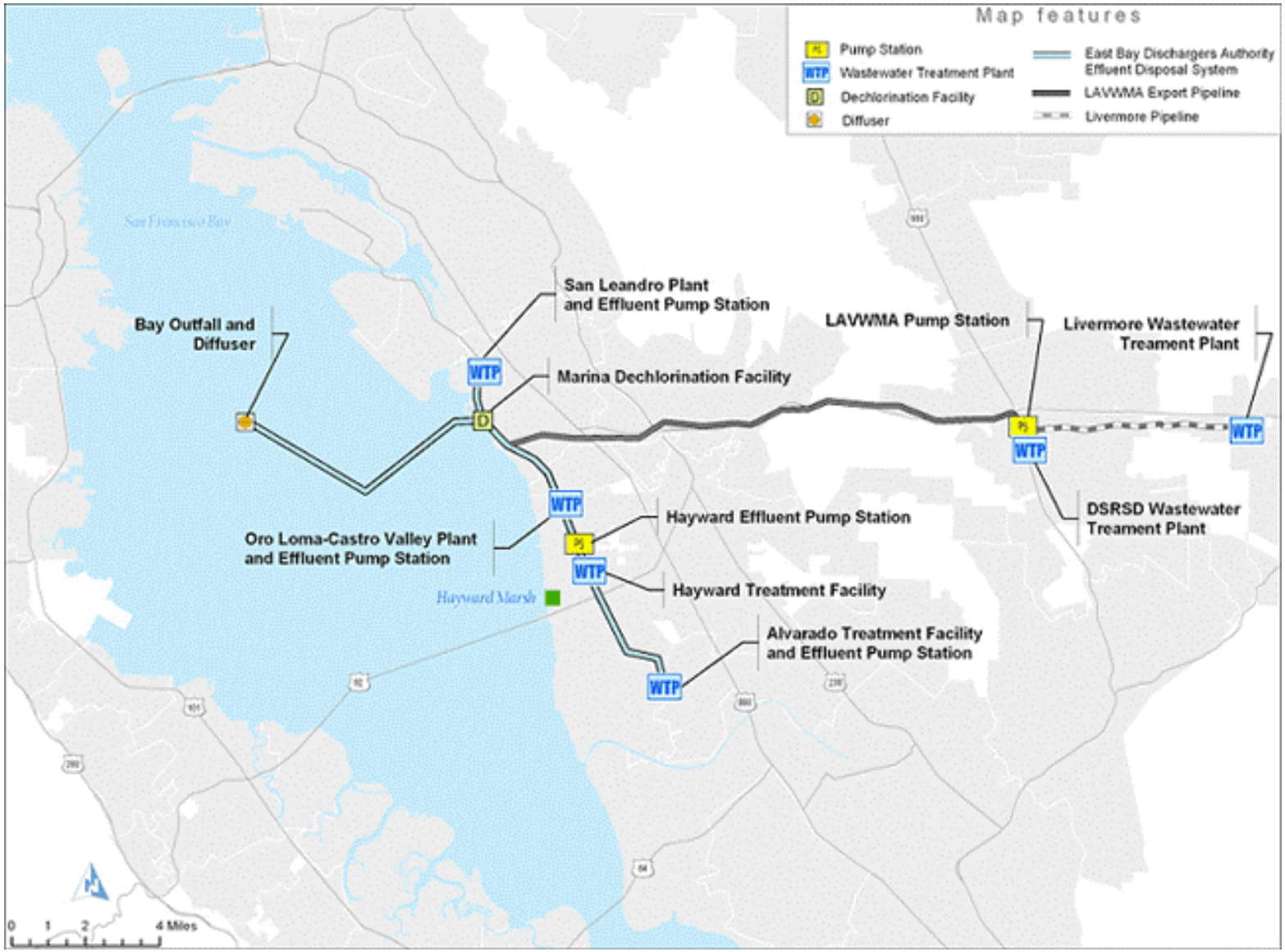
- Workers' Compensation
- Occupational Safety & Health (OSHA)
- Labor Laws
  - Wages, hours of work, and conditions of employment
  - Impacts contracting as well

Federal Agencies

- Environmental Protection Agency
  - Permit oversight
  - California Toxics Rule
  - National Toxics Rule
  - Wet Weather Issues
- The “Services” –
  - National Marine Fisheries; Fish & Wildlife
  - Consultation with EPA on Water Quality Standards

Variations among POTWs

- Coverage area
  - Size of area
  - Types and size of dischargers within coverage area
    - Industrial
    - Commercial
    - Residential
- Receiving waters
  - Ocean
  - Lakes
  - Streams
  - Percolation (arid areas and Central Valley)
- Method and degree of treatment

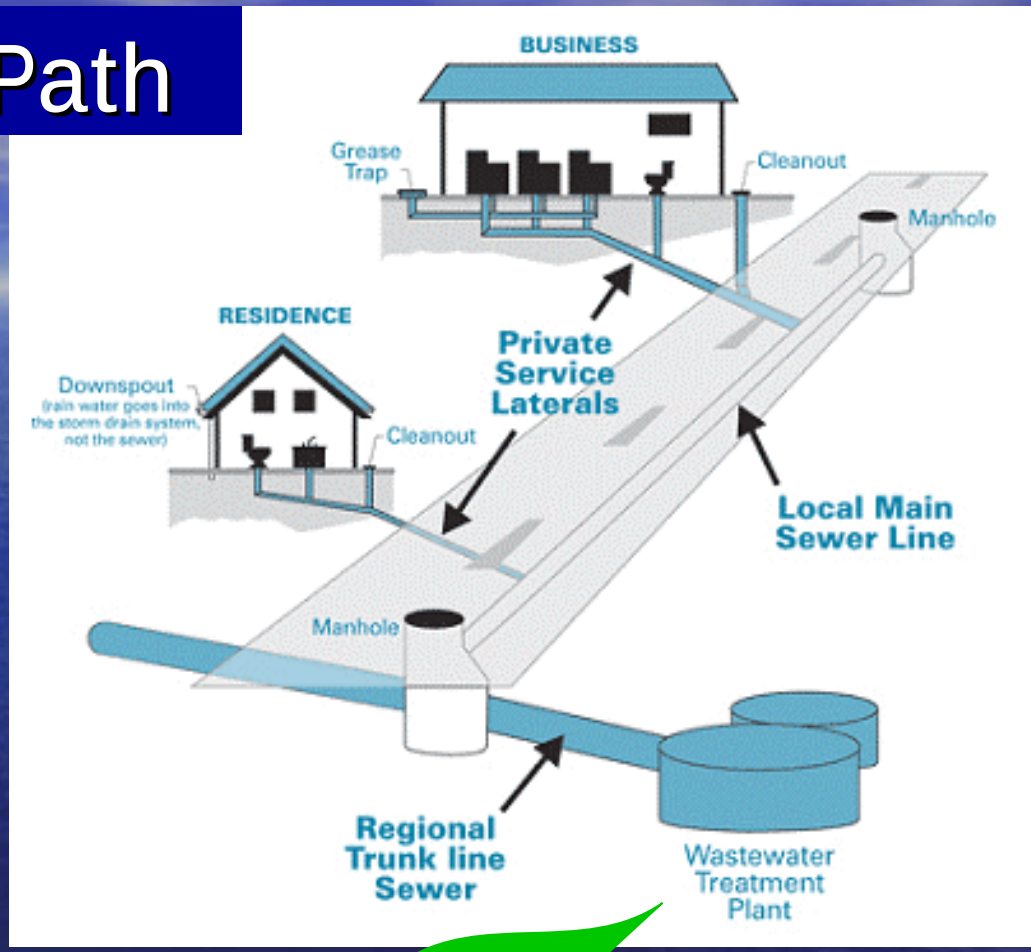

Map features
Pump Station
Wastewater Treatment Plant
Dechlorination Facility
Diffuser
East Bay Dischargers Authority Effluent Disposal System
LAVWMA Export Pipeline
Livermore Pipeline
San Francisco Bay
Bay Outfall and Diffuser
San Leandro Plant and Effluent Pump Station
Marina Dechlorination Facility
LAVWMA Pump Station
Livermore Wastewater Treament Plant
DSRSD Wastewater Treament Plant
Hayward Effluent Pump Station
Oro Loma-Castro Valley Plant and Effluent Pump Station
Hayward Treatment Facility
Hayward Marsh
Alvarado Treatment Facility and Effluent Pump Station
0 1 2 4 Miles

Publicly Owned Treatment Works

- Collect and treat wastewater from the service area
- Use physical, biological, and chemical processes to remove inorganic and organic materials from the wastewater
- Discharge Treated Wastewater
  - Effluent must meet Permit Requirements based on Receiving Water Beneficial Uses
- Manage Residuals
  - Biosolids
  - Air Emissions and Odors

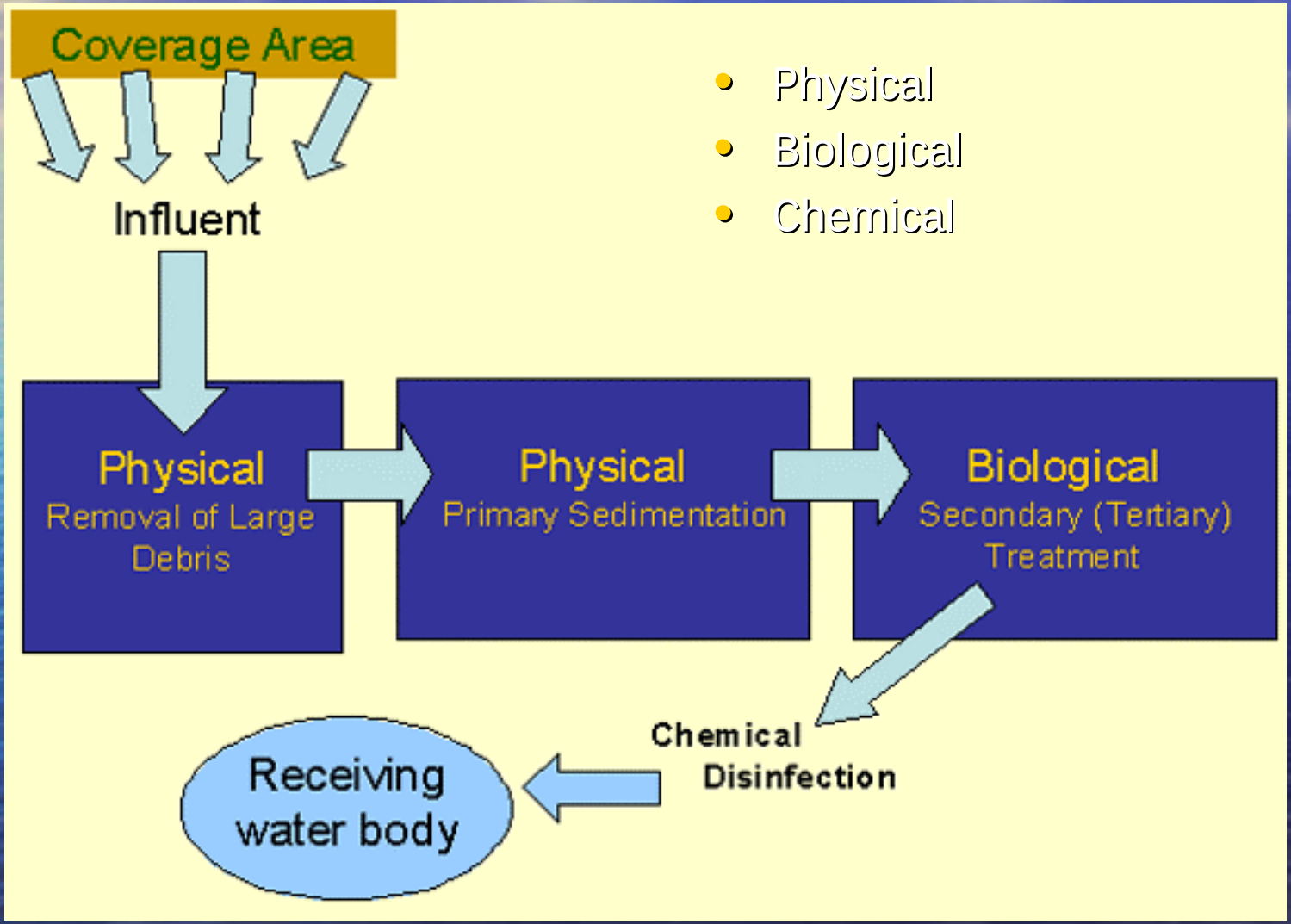
The Wastewater Path

- Infrastructure
  - Ages over time
  - Expensive to upgrade



Discharged water

Wastewater Treatment Process



- Physical
- Biological
- Chemical

Wastewater Treatment Process

- Physical
  - Preliminary treatment
    - Screens large debris
    - Removes grit (sand, coffee grounds)
  - Primary treatment
    - Larger materials settle & wastewater is clarified
    - Removes some nutrients & contaminants
    - Yields solids

Wastewater Treatment Process

- Biological & Physical
  - Secondary treatment
    - Removes smaller particles and dissolved organics
    - Removes some nutrients & contaminants
    - Yields solids – used as “biosolids” for land application
  - Tertiary treatment
    - Nutrient removal
    - Filtration

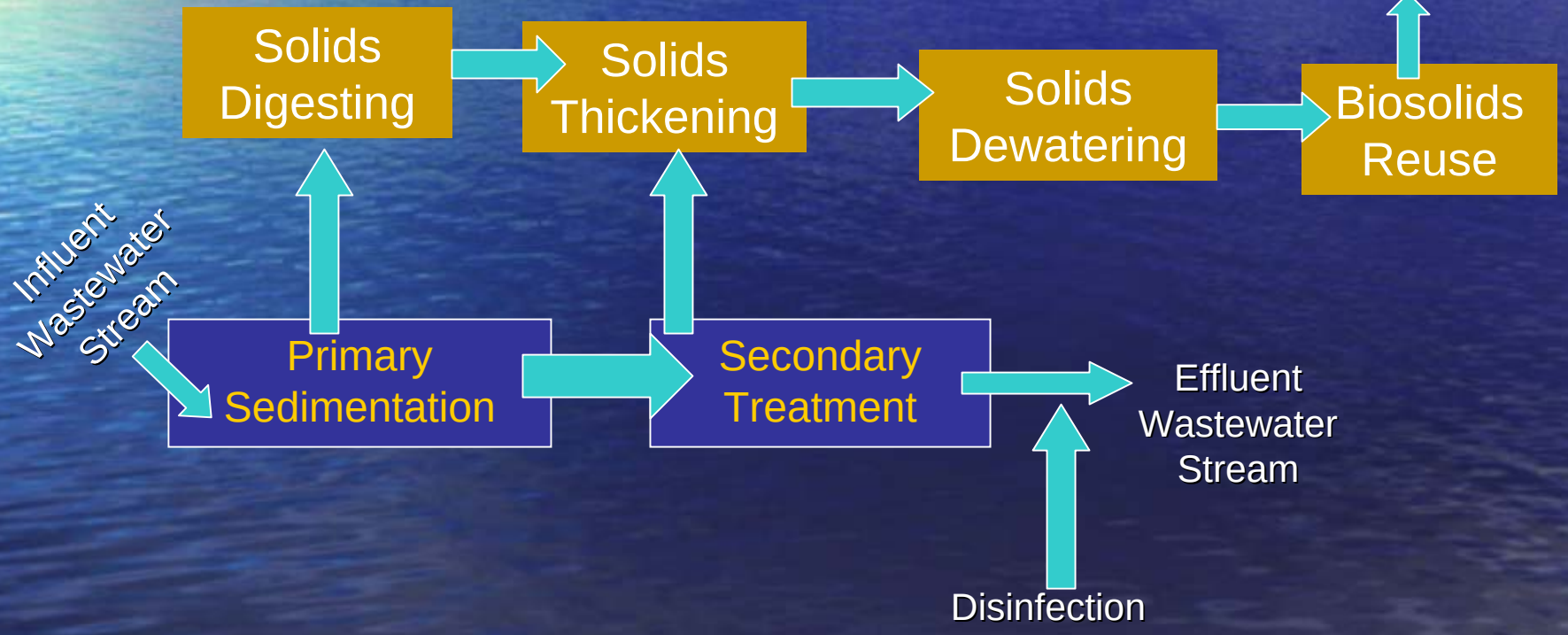
Wastewater Treatment Process

- Chemical
  - Disinfection
  - Kills pathogens
  - Uses Chlorine or Ultraviolet
- Dechlorination
  - Chemical to neutralize residual chlorine

Wastewater Treatment Process

- Treatment of solids
  - Anaerobic digestion
  - Stabilization of solids and capture of methane
  - Methane used to produce heat and energy
  - Residual biosolids

Land Application



Monitoring and Reporting

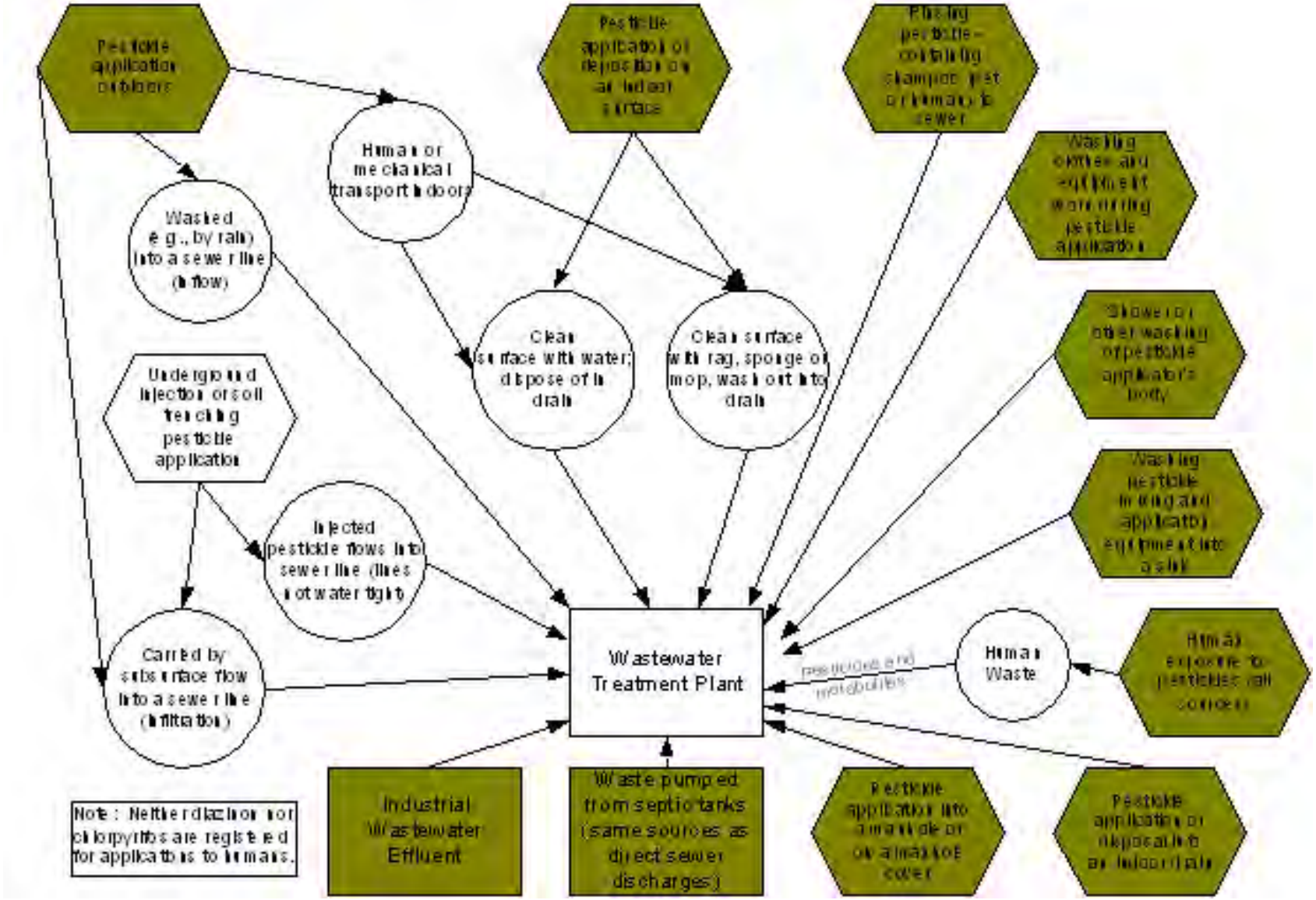
- Sophisticated Laboratories with Certified Staffs
  - Plant Operations
  - Influent and Effluent Monitoring for inorganics, organics, including priority pollutants
  - Bacteriological testing
  - Effluent Toxicity testing
- Monthly, Quarterly, and Annual Reporting

Pesticides in POTWs

Methods of entrance to POTWs

- Intentional introduction
  - Pesticides in drains for pest or root removal
  - Improper disposal
- Unintentional introduction
  - Washing or rinsing of fabrics or surfaces treated with pesticides
  - Excessive or Improper Use by Applicators
- Infiltration from storm water and groundwater into sewer lines

Wastewater Carries Pesticides to POTWs, Biosolids, Recycled Water & Surface Water

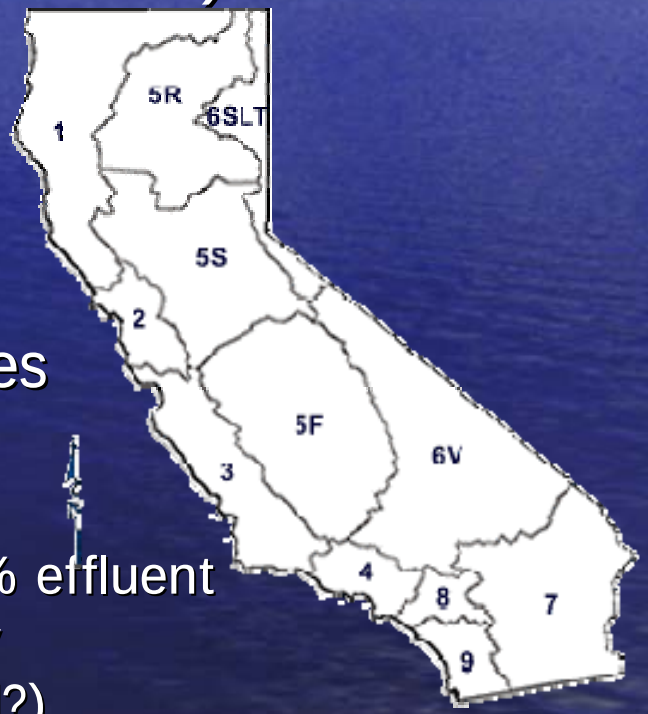


Permitting Overview

- National Pollutant Discharge Elimination System (NPDES) - Federal Clean Water Act
- Porter – Cologne Water Quality Control Act – State Law
- Environmental Protection Agency – California Toxics Rule (CTR) (criteria for > 100 priority pollutants)
- State Water Resources Control Board – State Implementation Policy (SIP – to implement CTR)

Permitting Overview

- Regional Water aQuality Control Board
- Water Quality Control Plans (Basin Plan)
  - Beneficial Uses
  - Water Quality Objectives (CTR too)
  - Implementation Plans
- Effluent Limits
  - Priority pollutants including pesticides
    - Where reasonable potential exists
  - Whole Effluent toxicity testing
    - Uses most sensitive organisms on 100% effluent
    - Acute (is it lethal?) numeric limits apply
    - Chronic (growth or reproduction limited?)
    - Test Failures Require Toxicity Identification Evaluation and Toxicity Reduction Evaluation



Enforcement Concerns

- Federal Enforcement - Clean Water Act (CWA)
  - EPA action for noncompliance – i.e. permit violations
  - Provisions for citizen suits
- State Enforcement – Regional Boards
  - Electronic Reporting of Data (CIWQS)
  - Mandatory Minimum Penalty (MMP) – requires a minimum fine of $3,000 per violation (SB 709)
- TMDLs Issued by Regional Boards
  - Establishes Wasteload Allocations for POTWs
  - SF Bay has one for Legacy Pesticides
- Prevent today's pesticides from becoming future legacy pesticides

Future Regulations

Emerging Contaminants → concern → Future Regulations

- Consumer products of potential concern
  - Silver washing machines
  - Copper from impregnated clothing
  - Triclosan from hand soaps
  - Pyrethroids impregnated in clothing
- Household pest control

Pyrethroids Indoor Use

- Pet Fleas
- Impregnated Clothing (Buzz-Off Clothing)

Tri-TAC Success Stories

- Copper Root Killer (pure copper sulfate)
  - Copper limits in SF Bay Area – one use causes 20 million gallons of wastewater to exceed standards
  - Public Education Campaign
  - Began at a local level
  - DPR banned in 1996!

Lindane (1998)

- Toxicity testing violations
- TIE identified Lindane in head lice shampoo
- Eventual State legislation banned use in head lice and scabies treatment in 2002
- Lessons Learned
  - Pesticides may cause compliance problems
  - POTWs have Limited regulatory authority to control
  - Need DPR assistance

Samsung Silver Wash

- Would discharge ionic silver (a toxic metal) during wash and rinse cycles directly to the sewer
- Tri-TAC letters to EPA
- EPA Update: “the Samsung washing machine is a pesticide that requires registration”

Chlorpyrifos

- Effluent Toxicity Testing Violations
- Urban and Rural Stormwater Runoff Toxicity
- EPA Re-registration
  - Almost all residential use to end by 2005
  - Commercial and agricultural uses remain at reduced levels

Tri-TAC's Requests of DPR

- Consider pathways to sewers during registration
  - Proactive instead of reactive
- Tri-TAC can assist in identifying potential pesticides of concern and evaluation methods
- Provide Information to DPR staff on Water Quality Issues
  - POTWs and Stormwater
- Develop method to evaluate impacts on POTWs– something like EPA "down the drain" model
- Incorporate this Process into DPR's normal Program to ensure sufficient funding

Summary

- Pesticides can become problems from a variety of sources
- POTWs are heavily regulated yet have limited ability to control pesticide inputs to our systems
- Wastewater treatment plants are not designed to remove pesticides
- POTWs must meet all Effluent Limits including Whole Effluent Toxicity
- Tri-TAC desires to partner and collaborate with DPR and other stakeholders

Thank You

Questions?