SANITATION DISTRICTS OF LOS ANGELES COUNTY

# Pesticides and POTWs: Opportunities and Challenges

**Preeti Ghuman**

**May 20, 2010**

# What Is Tri-TAC?

- Technical Advisory Committee formed in the 1970s
- Goal:
  - Improve “the overall effectiveness and accountability of environmental programs that impact POTWs in California.”
- Represents POTWs via its 3 sponsoring organizations:
  - League of California Cities (480 cities)
  - California Association of Sanitation Agencies (216 member agencies)
  - California Water Environment Association (~9,000 members)
- Constituents include representatives from most of the sewered population in California
- Monthly Meetings – Air, Land, and Water Committees

www.tritac.org

# California Urban Pesticide Facts

- >900 registered pesticide active ingredients
- >11,000 registered pesticide products
- At least 50% of pesticide use is in urban areas


Source: Urban Pesticides Use Trends Annual Report 2008, TDC Environmental.

# Pesticide Compliance Driven by Toxicity & TMDLs

- Toxicity is the compliance key for most pesticides
  - Clean Water Act (CWA) narrative discharge standard “no toxics in toxic amounts”
  - Numerical water quality standards exist for only about 20 of the 900 pesticides
- Total Maximum Daily Loads (TMDLs) are setting tough standards
  - Many in progress for pesticides or toxicity
  - More anticipated (pyrethroids)

# POTWs Have Little Control Over Pesticides

- Cannot regulate sales or use
- Can regulate discharge
  - But is this practical?
- Can use voluntary programs
  - Even expensive programs usually can't obtain reductions needed for compliance

# Main US EPA Activities

- Pesticide Registration & Registration Review
  - Pesticides should "*not cause unreasonable risks to human health, workers, or the environment when used as directed on product labeling*."
  - By pesticide "active ingredient"
  - 15 year review cycle
    - No action between reviews
  - Do environmental risk assessments
    - Don't use water quality criteria
    - Often don't consider sewer discharges
    - Don't address cumulative risks
    - Don't fully assess degradates, "inerts" & synergists
  - Allow public comments

# Main California Department of Pesticide Regulation (DPR) Activities

- Pesticide Product Registration
  - Each product individually (by name, not a.i.)
  - No evaluation of aquatic toxicity for urban products
  - No environmental risk assessment
  - No assessment of sewer discharges
  - Almost no public information—hard to comment
- Reevaluation
  - Can address environmental problems
  - Generally want proof of harm prior to action
  - Decide breadth of requirements without public involvement

# Pesticide/Water Quality Regulatory Gaps

- CWA and pesticide registration not coordinated
  - Pesticides registered for uses that will cause CWA violations & POTW compliance problems
  - Pesticide registration rarely considers sewer discharges
- Water regulators and pesticide regulators work independently
- US Food and Drug Administration (FDA) evaluates impacts of pesticides with pharmaceutical uses

# Tri-TAC Pesticide Activities

- Identify pesticides of concern
- Review environmental risk assessments
- Prepare comment letters
- Participate in meetings, conference calls & stakeholder groups
- Work with Urban Pesticide Pollution Prevention Project (UP3 Project)
  - Cost effective
  - Coordinate with existing regulatory processes
  - Request special action to address current problems
  - Utilize UP3 Project scientific and regulatory support

# Tri-TAC
# Major Pesticide Projects

- DPR Pyrethroid Reevaluation
- Comment Letters

# Pyrethroids & Pyrethrins

- 75% of pyrethroid use occurred in urban areas
- Highly toxic to aquatic organisms
- Direct pathways to POTWs (impregnated fabric; human & pet wash-off treatments)
- Indirect pathways to POTWs (indoor pesticide application & inflow)
- Synergists (PBO, MGK-264) can make products more toxic

Source: Urban Pesticides Use Trends Annual Report 2008, TDC Environmental.

# DPR Pyrethroid Reevaluation

"The reevaluation is based on monitoring surveys and toxicity studies revealing the widespread presence of pyrethroid residues in the sediment of both agricultural and urban dominated California waterways at levels toxic to *Hyalella azteca (H. azteca)*."

- Begun in August 2006
- Requires registrants submit additional data for 20 pyrethroids
- Requires registrants conduct POTW effluent monitoring for permethrin (at their cost)
  - Permethrin residues identified by DPR as likely to enter POTWs include: pet shampoos, products impregnated into or sprayed onto clothing/bedding & products used to treat sewers

# Pyrethroid Monitoring

- Low detection limits needed
  - Water— less than 0.001 ppb
  - Sediment— less than 1 ng/g (dry weight)
  - Few labs can achieve
    - Research:
      - California Department of Fish and Game
      - Southern Illinois University
    - Commercial:
      - CRG Marine Laboratories, Torrance, CA
      - Caltest Analytical Laboratory, Napa, CA
      - AXYS Analytical Services, BC, Canada

Photo courtesy USGS

# Tri-TAC Response

- Supportive of reevaluation
- Requested influent, effluent & biosolids monitoring for 8 pyrethroids
- Requested influent, effluent & biosolids analytical and sampling methods be developed by registrants

# Weston and Lydy Study

Environ. Sci. Technol., 2010, 44 (5), pp 1833–1840

- Evaluated pyrethroid pesticide toxicity in the Sacramento/San Joaquin Delta
- Collected dry and wet weather whole water samples in 2008 & 2009 for:
  - toxicity testing with *Hyalella azteca*
  - analysis of pyrethroids (and chlorpyrifos)
- Evaluated effluent from 3 POTWs
  - Tertiary oxidation ponds – Stockton
  - Secondary activated sludge – Sacramento
  - Tertiary activated sludge – Vacaville

# Weston and Lydy POTW Study Results

- Pyrethroids often found in POTW effluent, usually right around the EC50
- Frequency of toxicity highly variable among facilities (100% Sac., 0% Stockton)
- In terms of mass discharged, the Sacramento POTW is the largest single discharger of pyrethroids to the Delta (about 10 g daily, vs. 2-8 g/d for individual urban pump stations following rains)
- Further study will be necessary to determine why pyrethroids are present in POTW effluent as often as they are, how they get through the plants, or why the compounds present vary substantially from one time to another

# Tri-TAC Comment Letters

- Pyrethroids/Pyrethrins
  - 14 letters have been sent since 12/02
- Head lice treatments
- Synergists
- Impregnated fabrics
- Samsung “Silver Wash” washing machines
- Inert ingredient disclosure
- Data requirements
- Procedural rules

# Comments to US EPA and DPR

- Provide information
  - Which uses cause sewer discharges and how
  - Explain wastewater treatment processes (i.e. photolysis not likely to occur)
  - Explain discharge requirements
    - NPDES permit limits and requirements
    - Effluent dominated water bodies
- Request actions
  - Analysis of sewer discharge in risk assessments
  - Mitigation measures during registration/registration review
  - Reiterate that EPA's assistance is needed for compliance
  - Register pesticide products (impregnated pesticides, washing machines) as pesticides
  - Reassert authority over pesticide pharmaceuticals

# Response from US EPA and DPR

- US EPA permethrin preliminary risk assessments (Aug. 2005)
  - Selected model to evaluate sewer discharges
  - Identified uses that cause sewer discharges
  - Performed a “Down the Drain” Assessment
- DPR reversed decision to register impregnated items (Jan. 2006)
- US EPA decided to regulate Samsung “Silver Wash” washing machines as pesticides (Nov. 2006)

# Contact Information

Preeti Ghuman

Los Angeles County Sanitation Districts

(562) 908-4288, ext. 2904

pghuman@lacsd.org

Acknowledgement:

Kelly Moran, Ph.D., TDC Environmental