

# What's the Cure for Pharmaceuticals in Wastewater?

---

*California Perspective*

Melody LaBella  
NACWA P3 Workshop  
May 17, 2013



**Central Contra Costa Sanitary District**

*Protecting Public Health and the Environment*

# Central Contra Costa Sanitary District (Central San)



# About Central San

- ADWF of 33.2 MGD (2012)
- Serve 467,500 people and ~3,000 businesses in a 146 mi<sup>2</sup> service area 35 miles east of SF
- Household Hazardous Waste Collection Program
  - Collect ~2 million pounds of HHW each year
  - Pharmaceutical collection at 11 law enforcement partner agencies in our District (non-controls only)
  - Collected over 35,000 pounds of unwanted medications since program inception 2009

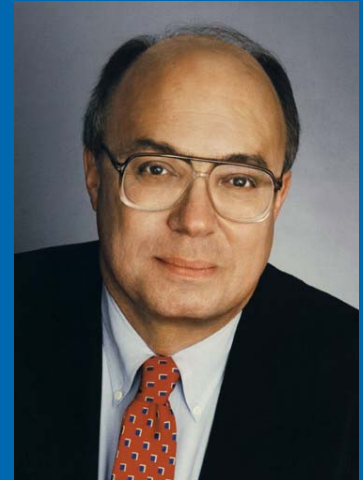
# Frame of Reference

- Drug companies' revenues climbed more than \$200 billion between 1995 and 2010.
- Studies assign that growth to the industry spending \$19 on promotion and marketing for every \$1 spent on research.
- 2011 US prescription drug sales
  - \$227,551,806,436
- 2011 CA prescription drug sales
  - \$25,218,537,904
- US Prescription drug sales fell 1% in 2012
  - 1<sup>st</sup> time since tracking started in 1957



# Legislative Efforts

- **SB 966 (Simitian) 2007**
  - **There Ought to Be a Law Contest 2006**
    - Intent was to require pharmacies to establish collection for unwanted medications
  - Developed “model program” guidelines
  - Final report to the legislature in December 2010 recommended EPR legislation



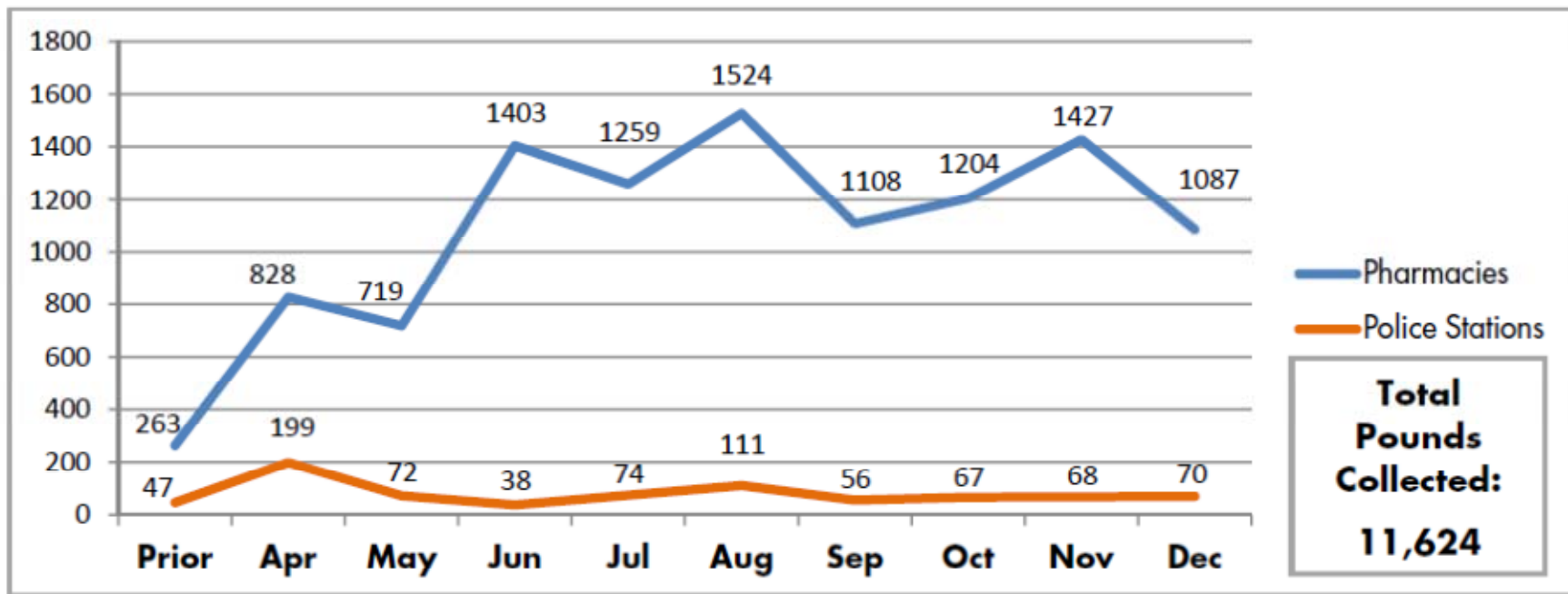
Rebecca Kassel

# Legislative Efforts

- City and County of San Francisco Board Supervisor Ross Mirkarimi introduced a Safe Drug Disposal Ordinance in December 2010.
  - Passed 7-4 on first reading
  - Pharmaceutical industry intervened and persuaded Board to instead opt for a pilot collection program funded by PhRMA and Genentech (\$110,000)
  - No major pharmacy chains participated (>70%)
  - 13 independent pharmacies and 10 police stations
  - SF adopted Ordinance requiring all pharmacies to advertise disposal locations

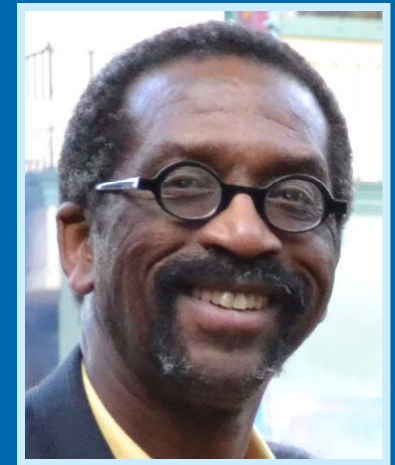


# San Francisco's 2012 Results



# Legislative Efforts

- Supervisor Nate Miley introduced Alameda County's Safe Drug Disposal Ordinance in March 2012; passed 5-0 at first reading
- Industry intervened; complained of not being included in the process
- Series of stakeholder meetings held
- Organizing support was critical
- Adopted unanimously in July 2012, making Alameda the 1<sup>st</sup> County in the nation to pass an EPR Ordinance for unwanted medications



Supervisor Miley



Kamika Dunlap



## Lawsuit Filed 12/7/12

**The New York Times**

Article on 12/7/12 quotes complaint:

**“The household trash can is a better and safer alternative, the drug makers say”**

- PhRMA, Generic Pharmaceutical Association & Biotechnology Industry Association
- Filed in Federal Court claiming violation of the Commerce Clause of the Constitution
- Alameda filed initial response on 12/28/12
- Alameda just filed a cross-motion for summary judgment on 5/9/13.

# Legislative Efforts

- April 2013 Senator Hannah-Beth Jackson (Santa Barbara) introduces SB 727, requiring producers to implement EPR
- Cosponsors include:
  - Clean Water Action
  - CA Product Stewardship Council
  - CA Alliance for Retired Americans
  - Alameda County
  - City and County of San Francisco



# Lessons Learned

- The pharmaceutical industry's lobby should not be underestimated.
- Their arguments against EPR will include:
  - Trash is the answer for drug disposal
  - Cost to implement a statewide program is “considered tremendous and non-absorbable”
  - End-of-life management of drugs is ingestion.
  - They will ask what problem you are trying to solve.
  - Commerce Clause violation
- To take on the pharmaceutical industry, support needs to be organized.

# What is the “Cure?”

- Drugs are designed to impact biological systems at low doses.
- Drugs are not designed with the environment in mind.
- Treatment plants aren't designed to remove dilute concentrations of complex chemicals.
- We can't yank all existing drugs off shelves and insist that the manufacturers go back and redesign them.
- This is a long-term issue (no cure).
- However...



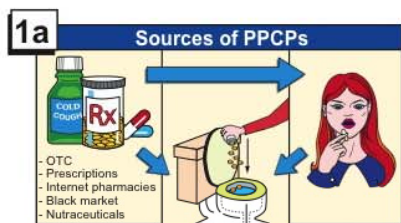
Do we have to wait until there is a water quality problem?



# What is the “Cure?”

- We need to do what we can now to reduce the amount of pharmaceuticals entering the wastewater stream before we get to a problem.
  - **Precautionary approach**
- Unwanted and expired medications are the proverbial “low hanging fruit.”

# Is Trash the Cure for Unwanted Medications?

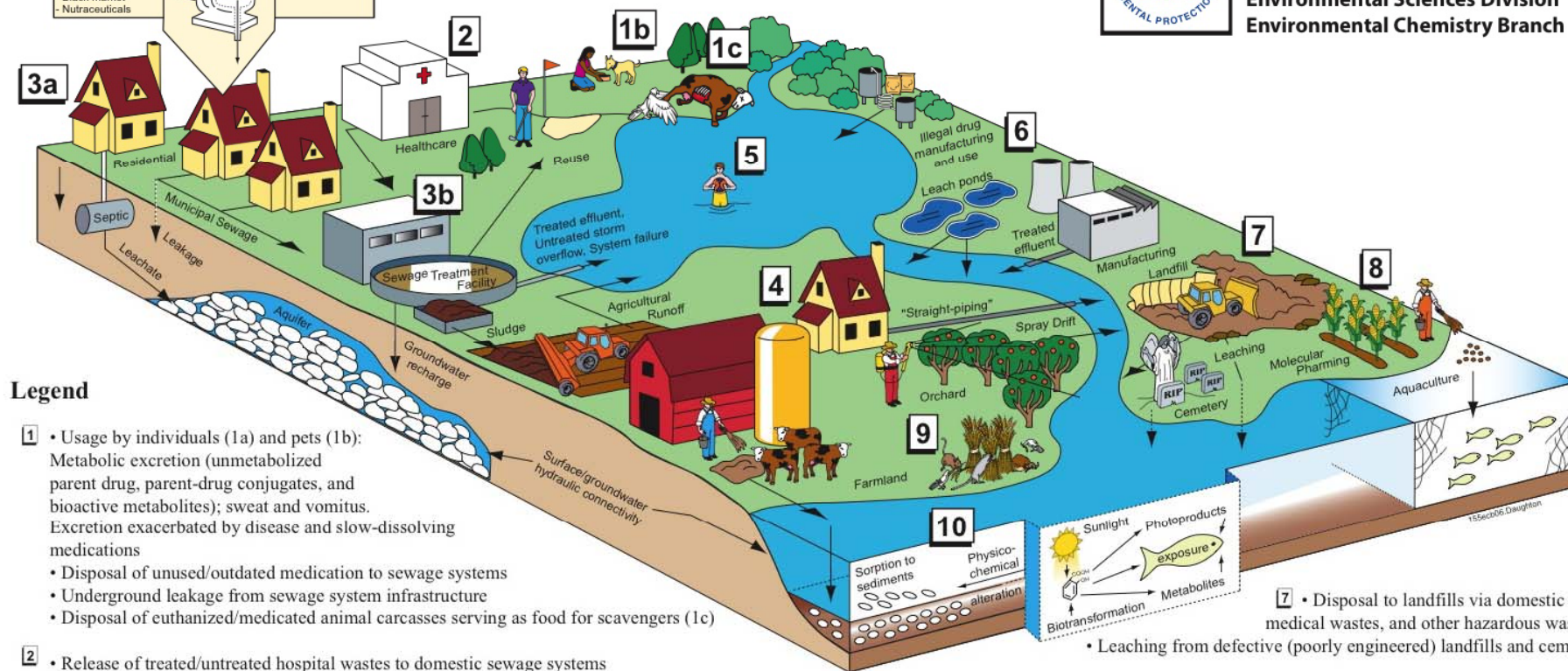


# Origins and Fate of PPCPs<sup>†</sup> in the Environment

<sup>†</sup> Pharmaceuticals and Personal Care Products



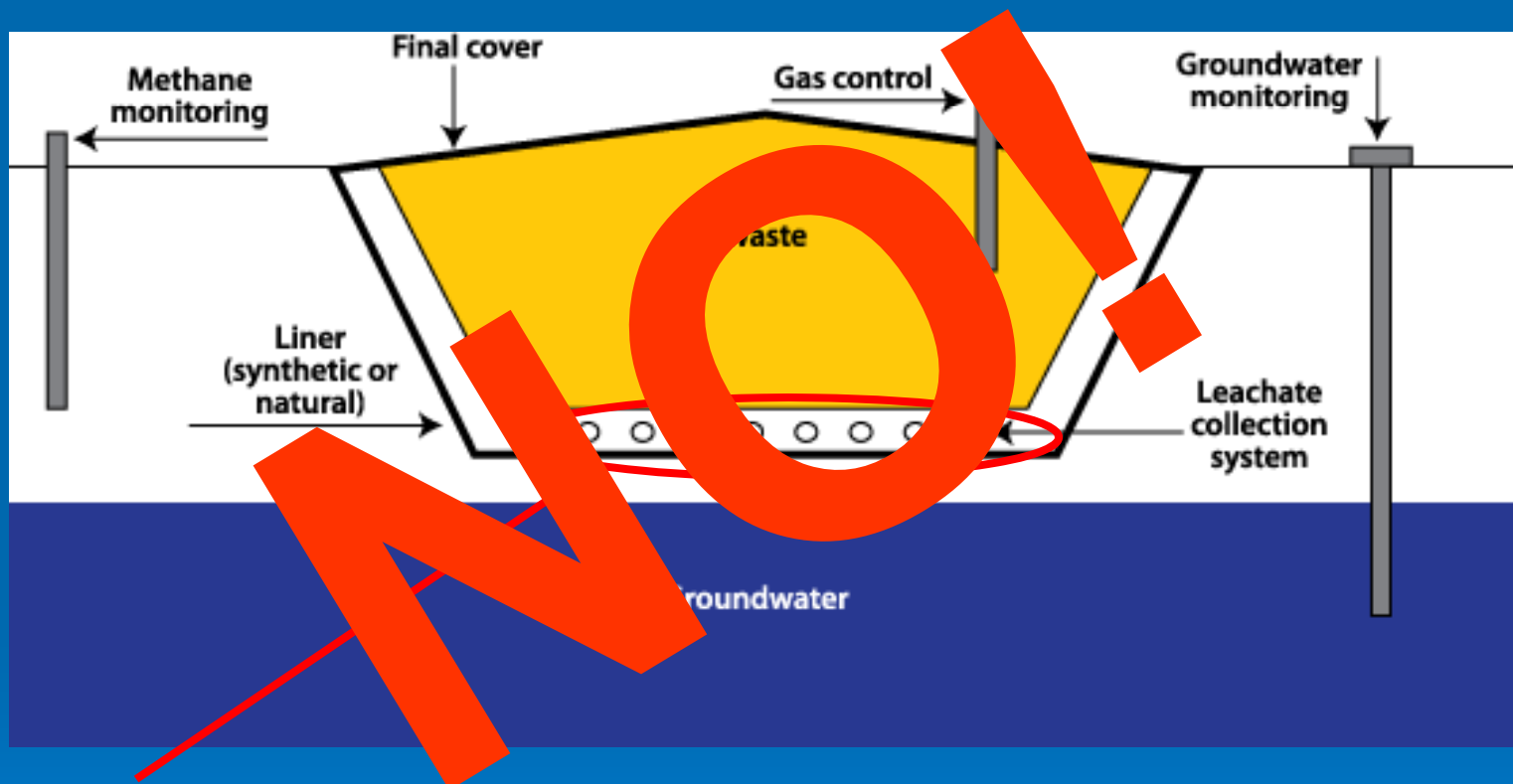
U.S. Environmental Protection Agency  
Office of Research and Development  
National Exposure Research Laboratory  
Environmental Sciences Division  
Environmental Chemistry Branch



## Legend

- Usage by individuals (1a) and pets (1b): Metabolic excretion (unmetabolized parent drug, parent-drug conjugates, and bioactive metabolites); sweat and vomitus. Excretion exacerbated by disease and slow-dissolving medications  
• Disposal of unused/outdated medication to sewage systems  
• Underground leakage from sewage system infrastructure  
• Disposal of euthanized/medicated animal carcasses serving as food for scavengers (1c)
- Release of treated/untreated hospital wastes to domestic sewage systems (weighted toward acutely toxic drugs and diagnostic agents, as opposed to long-term medications); also disposal by pharmacies, physicians, humanitarian drug surplus
- Release to private septic/leach fields (3a)  
• Treated effluent from domestic sewage treatment plants discharged to surface waters, re-injected into aquifers (recharge), recycled/reused (irrigation or domestic uses) (3b)  
• Overflow of untreated sewage from storm events and system failures directly to surface waters (3b)
- Transfer of sewage solids ("biosolids") to land (e.g., soil amendment/fertilization)  
• "Straight-piping" from homes (untreated sewage discharged directly to surface waters)  
• Release from agriculture: spray drift from tree crops (e.g., antibiotics)  
• Dung from medicated domestic animals (e.g., feed) - CAFOs (confined animal feeding operations)
- Direct release to open waters via washing/bathing/swimming
- Discharge of regulated/controlled industrial manufacturing waste streams  
• Disposal/release from clandestine drug labs and illicit drug usage
- Disposal to landfills via domestic refuse, medical wastes, and other hazardous wastes  
• Leaching from defective (poorly engineered) landfills and cemeteries
- Release to open waters from aquaculture (medicated feed and resulting excreta)  
• Future potential for release from molecular pharming (production of therapeutics in crops)
- Release of drugs that serve double duty as pest control agents:  
examples: 4-aminopyridine, experimental multiple sclerosis drug → used as avicide; warfarin, anticoagulant → rat poison; azacholesterol, antilipidemics → avian/rodent reproductive inhibitors; certain antibiotics → used for orchard pathogens; acetaminophen, analgesic → brown tree snake control; caffeine, stimulant → coqui frog control
- Ultimate environmental transport/fate:  
• most PPCPs eventually transported from terrestrial domain to aqueous domain  
• phototransformation (both direct and indirect reactions via UV light)  
• physicochemical alteration, degradation, and ultimate mineralization  
• volatilization (mainly certain anesthetics, fragrances)  
• some uptake by plants  
• respirable particulates containing sorbed drugs (e.g., medicated-feed dusts)

# Is Trash the Cure for Unwanted Medications?



Where does leachate go?

# Multi-pronged Approach

- Source control
  - Environmental standards for new drugs
  - Prescribing practices
  - Healthier lifestyles
- Better waste management (EPR)
- Public education
- Monitoring
  - Method development





# Moving Forward

- Share information and experiences
- Speak the same language
- Speak the right language
  - ~~• “90% excreted vs. 10% direct disposal”~~
- Stand together and speak as one voice.
- Push hard

# Need for Utilities to Push for Strong Action

## **BIG SPENDERS:** TOP 10 LOBBYISTS OF 2012

U.S. Chamber of Commerce	\$95,660,000
National Association of Realtors	\$26,003,435
Blue Cross/Blue Shield	\$16,238,032
General Electric	\$15,550,000
Google Inc	\$14,390,000
PhRMA	\$14,380,000
AT&T Inc.	\$14,030,000
American Hospital Association	\$13,305,200
National Cable & Telecomm. Association	\$13,010,000
American Medical Association	\$12,980,000

Source: Center for Responsive Politics

# Long-term Role for Wastewater Agencies



We need to think about what our next steps will be should the pharmaceutical industry prevail against Alameda County.