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Emerging Pollutants

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• Technology to detect pollutants has advanced far beyond practicable technology to remove such pollutants

• What is EPA’s response? FDA? FDEP?

• What legal issues arise for public water and wastewater service providers?
Major EPA focus is on Pharmaceuticals and Personal Care Products (PPCP’s).

According to EPA, 92% of the substances constituting concern in reference to the water supply are NOT prescription drugs, but are over the counter cold remedies, pain relievers, hormone supplements, etc.

These products typically have expiration dates and at some point become “waste”.

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• PPCP’s typically enter the environment and water supply through the sanitary waste treatment system. This may happen by:
  – Passage through the body
  – Direct washing or dumping
• Treatment technology to remove PPCP’s at sanitary waste treatment plants is not practicable at this time.

• Even membrane (Reverse Osmosis) treatment may be unable to effectively remove miniscule concentrations.

• If R.O. worked, it would likely not be practicable at the volumes passing through the plant (no pun intended)....
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Emerging Pollutants [Courtesy of Geosyntec Consultants]

- Pharmaceuticals and EDCs in ecosystems
- **Prozac** 150 ppb induces spawning in zebra
- Mussels

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Emerging Pollutants [Courtesy of Geosyntec Consultants]
• Synthetic oral contraceptives <10 ppb
• causes feminization in male fish
Antibiotics into environment causes antibiotic resistance among bacterial pathogens.

Wild geese near Chicago, Illinois resistant to 4 major antibiotics, including penicillin and erythromycin.
• **HOWEVER,**

• "For those drugs for which environmental assessments have been required, there has been no indication of environmental effects due to flushing….” FDA 10/09.

• In addition, according to the Environmental Protection Agency, scientists to date have found no evidence of adverse human health effects from pharmaceutical residues in the environment.

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• By the time we confirm that low levels of PPCP’s actually DO affect human health (if that occurs), it may be too late to remove the risk from the water supply.
The only practicable way to reduce the flow of unused PPCP waste into the environment appears to be removal of the waste once the consumer determines that it will not be used for medical or personal care purposes.

This requires a safe disposal option and individual willingness to make the effort.

Voluntary collection sites are available in some communities
The need for action is apparent but legal obstacles exist:

- For prescription drugs, it is illegal for persons other than the patient to possess controlled substances.

- Other PPCP’s could be collected for disposal but there are liability issues and uncertainty regarding the characterization of waste.
• Ethical and Liability Issues

• Any program which allows the public to deposit their pharmaceuticals for disposal offers exposure to the program organizers unless the following issues are clearly and competently addressed:
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• Possibility that controlled substances will be part of the waste stream

• Any person knowingly accepting controlled substances is committing a crime

• A container with a person’s name and other information could get into the wrong hands
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• Any pharmacist or pharmacy employee accepting pharmaceuticals at the point of dispensing drugs is likely violating their state board of pharmacy regulations. The waste could be resold. The pharmacist could lose their license.
• Are the persons who accept the materials vetted? Do they participate in a drug testing program?
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• Is the waste destroyed to deter theft while being stored?
• Is the program designed to avoid any person other than the one depositing the waste from coming in contact with any containers?
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• Other legal / Policy issues:
  – Should the program be voluntary or mandated by legislation (e.g. require pharmacies to accept PPCP waste)
  – Should manufacturers be required to fund the cost of the program or should pharmacies and patients share in the cost?

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• Some pharmaceuticals (e.g. chemotherapy drugs) qualify as “hazardous waste” and collection / disposal requires compliance with RCRA.

• EPA’s proposed response is to add such substances to the “Universal Waste Rule”. The rule already streamlines collection of household wastes otherwise subject to RCRA such as batteries, pesticides and mercury-containing lamps.
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• Because the PPCP provisions for the Universal Waste Rule are less stringent than standard federal criteria (Resource Conservation and Recovery Act), individual states have the option of adopting or not adopting the new provisions.

• FDEP adopted the UWR provisions in May of 2009:

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• The FDEP rules address pharmaceuticals exhibiting characteristics of hazardous waste (ignitable, corrosive, reactive, toxic)
Liability under Florida Law – Chapter 376 / Aramark Case

Aramark v. Easton: Section 376.313(3) creates an private cause of action and absolute liability for damages to adjoining landowner (Fla. Sup. Ct. 2004)

What substances are covered?

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- Sec. 376.301

- (10) "Contaminant" means any physical, chemical, biological, or radiological substance present in any medium which may result in adverse effects to human health or the environment or which creates an adverse nuisance, organoleptic, or aesthetic condition in groundwater.

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• It’s only a matter of time before someone sues for exposure to an emerging pollutant in the environment

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Non-hazardous pharmaceuticals are addressed by White House Guidelines:

- Do not flush prescription drugs down the toilet or drain unless the label or accompanying patient information specifically instructs you to do so. For information on drugs that should be flushed visit the FDA’s website.
**Federal Guidelines:**

To dispose of prescription drugs not labeled to be flushed, you may be able to take advantage of community drug take-back programs or other programs, such as household hazardous waste collection events, that collect drugs at a central location for proper disposal. Call your city or county government’s household trash and recycling service and ask if a drug take-back program is available in your community.
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• If a drug take-back or collection program is not available:
  • 1. Take your prescription drugs out of their original containers.
  • 2. Mix drugs with an undesirable substance, such as cat litter or used coffee grounds.

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3. Put the mixture into a disposable container with a lid, such as an empty margarine tub, or into a sealable bag.
4. Conceal or remove any personal information, including Rx number, on the empty containers by covering it with black permanent marker or duct tape, or by scratching it off.

5. Place the sealed container with the mixture, and the empty drug containers, in the trash.

Office of National Drug Control Policy October 2009
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• The Act authorizes EPA to establish minimum standards to protect tap water and requires all owners or operators of public water systems to comply with these primary (health-related) standards.

• The 1996 amendments to SDWA require that EPA consider a detailed risk and cost assessment, and best available peer-reviewed science, when developing these standards.

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Stay tuned for SDWA development of guidelines as the science catches up…
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