

Update: Emerging Contaminants Summit

The current state of research, regulations and talking points

Current State of Research

Drinking Water, Wastewater and Biosolids

Constituent

Session

PFAS



Impacts to groundwater, soil

PFOA

Remediation techniques

1,4-Dioxane



Persistence

Trace Organics

Regulating

Pharmaceuticals



Communicating

EDCs

Impacts on drinking water

Chromium



Risk Management

Microbeads

What next?

Research on Biosolids

Examining removal proficiencies
in various treatment processes:

- ❖ Anaerobic Digestion
- ❖ Composting
- ❖ Liming
- ❖ Heat Drying
- ❖ Pyrolysis



What's in Biosolids

What trace organics are in biosolids and at what concentrations?

Do we see reductions when processing biosolids to meet Class A vs. Class B?

How do we put the results into perspective?

- **Wide variety of Pharmaceuticals**
 - Antibiotics
 - Steroids/hormones
- Antimicrobials
- PBDEs (polybrominated diphenyl ethers)
- PAHs (polycyclic aromatic hydrocarbons)
- PFASs (per- and polyfloro-)
- Fragrances
- Surfactants
- Parabens
- Bisphenol analogues

Study: 74 WWTP, 35 States 84 constituents

By: Dr. Lakhwinder Hundal

Constituent	Occurance	ug/g
Antibiotics		
Azithromycin	80	.008 - 5.2
Ciprofloxacin	84	.075 - 40.8
Hormone/Steroid		
17 α estradiol (birth control)	5	.016 - .048
β -strigmastanol (plant steroid)	83	3.0 - 1,330
Antimicrobials		
Triclocarbon	84	.187 - 441
Triclosan	79	.334 - 133

Study: 11 Class A products - 33 Constituents

By: Dr. Linda Lee

Constituent	Occurrence	ug/g
Pharmaceuticals		
Ciprofloxacin	Higher in heat dried	.006-.843
Ibuprofen	Higher in heat dried	.19-.456
Hormone/Steroid		
17 β estradiol		Not Detected
17 α estradiol (birth control)		Not Detected
Estrone	Higher in less processed	.043-.85
Antimicrobials		
Triclocarbon	Consistent across all treatments	.190-17.79
Triclosan	Consistent across all treatments	.285-19.98

So we have numbers, what do they mean?

Reality Check

- ❖ Very little difference between processes and classes
- ❖ When biosolids are land applied you have a 100-200-fold dilution.
- ❖ Pharmaceuticals and personal care products bind to organic matter – **limited bioavailability.**
- ❖ The risks are minimal in comparison to the benefits
 - ❖ We burn 7.3Kcal from fossil fuel to get 1Kcal of food.
 - ❖ Biosolids provide carbon sequestration
 - ❖ Biosolids build healthy soils

Regulatory Perspective

EPA

Why are we paying attention to biosolids?

- Only 7M dry tons of biosolids are land applied compared to 140M dry tons of manure
- Lots of data gaps – detection does not mean harm



Regulatory Perspective

Department of Defense

Scan, Watch, Action approach

What we should do

1. Confirmation sampling and characterization
2. Define unacceptable exposure
3. Site specific risk assessment- do not need an MCL

What is Europe doing?



- Limits for EDCs set low (pg/L) but only one facility can measure that small.
- They want treatment to occur at the WWTP.
- 4 German states have begun regulating emerging contaminants.
 - not a coordinated effort
 - all have different treatment approaches
- The Swiss are aiming to reduce release by 80% at the WWTP.

Legal

EPA= make a determination on 5 contaminants from the CCL every 5 years

No federal decision= state decision (this comes with consequences)

1. Regulations allow standards to be determined by good science
 2. Standards set by experienced teams
 3. Final standards set by regulators with stakeholder input
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1. Litigations are not science based
 2. Standards set by lawyers and jury
 3. Final decision by jury



Communication

Put things into perspective for the public



Isn't a billion more than a million?

Parts per million (ppm)

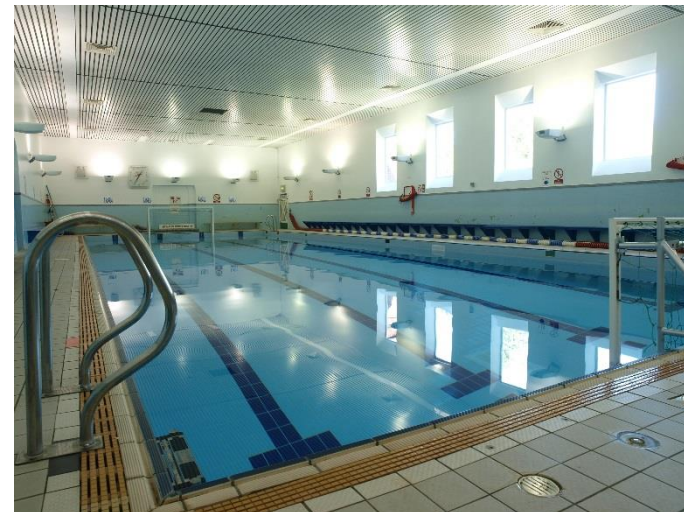
one penny in \$10,000

one bad apple in 2,000 barrels

Parts per billion (ppb)

one penny in \$10,000,000

one bad apple in 2,000,000 barrels



Communication

Be honest

Yes, there are trace organics

Put things in perspective

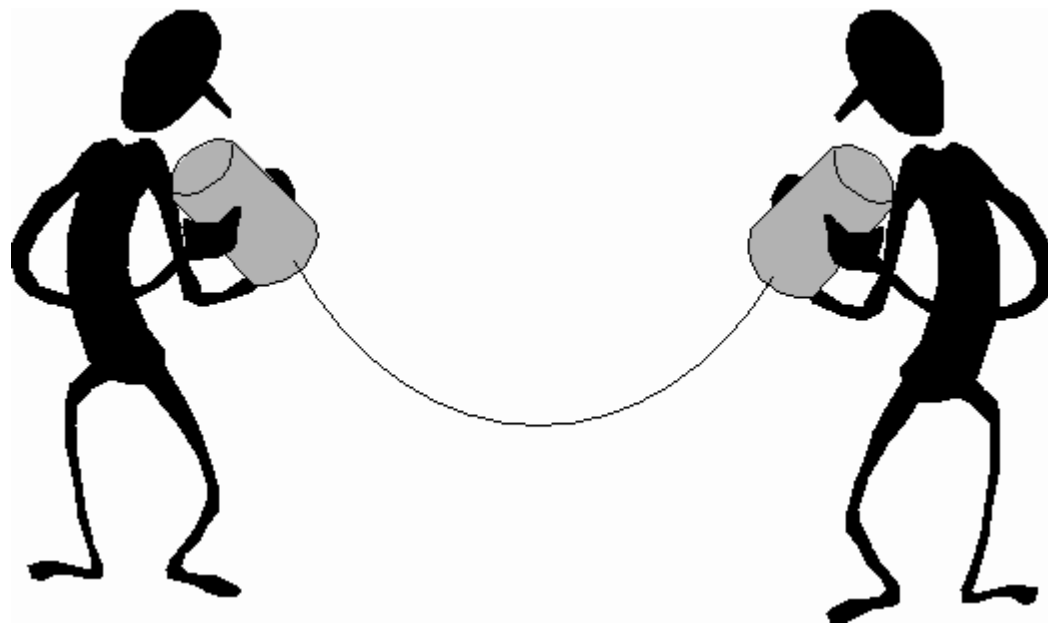
Detection does not mean harm

Be empathetic/Listen

This will gain respect and build trust

Remain positive/non-defensive

We know the benefits are good, in time, so will everyone



Thank You!

Any Questions?