Information Item:
Contaminants of Emerging Concern PFAS and Wastewater Treatment

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About today’s topic

- What are contaminants of emerging concern?
- What are PFAS?
- Implications for wastewater treatment plants
- MCES activities
- Wastewater industry engagement
- Summary

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Contaminants of emerging concern

- Emerging:
  - Newly identified or measurable
  - New information on their impacts
- Concern:
  - Impacts on health and/or environment
  - For Wastewater Treatment Plants:
    - Receive, do not produce them
    - Current processes may not destroy them
    - Very low concentrations
    - No standard/approved measurement methods
    - Undeveloped regulatory direction
    - Very costly to address
- Examples:
  - Endocrine disrupting compounds
  - Pharmaceuticals
  - Micro plastics
  - PFAS

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PFAS

Per- and- Poly Fluoro Alkyl Substances

-previously known as **PFCs** (perfluorinated compounds)

- Entered commerce in the 1940s
- Voluntary phase-out of some PFAS but new compounds are continually introduced, now >4000
- Non-stick, water-repellant, long-lasting
- Resistant to biological, chemical, and thermal degradation; i.e. “Forever Chemicals”
- Present in many household, commercial, and industrial products

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PFAS

- Now ubiquitous in the environment and in humans and wildlife
- Present in WWTP influent, some portion associates with the biosolids and some portion passes through with the liquid effluent
- Sources to wastewater treatment plants: Plating, landfills, domestic, commercial
- >4000 compounds of this type. Several specific compounds are key or leading the way:
  - PFOA = perfluoro octanoic acid
  - PFOS = perfluoro octane sulfonate
  - PFBS = perfluoro butane sulfonate

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Implications for wastewater treatment plants
Maine – biosolids PFAS screening

- A March 22, 2019 Memo by the Maine Department of Environmental Protection instituted a requirement for all sludge/biosolids program licensees in their state to test for PFOA, PFOS, and PFBS

- The screening levels initially established may lead to utilities not being able to land apply their biosolids

- For the crop year 2018/2019 ~ 10% of MCES's biosolids were land applied for beneficial agricultural use

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Implications for wastewater treatment plants
Lampeer, Michigan

LAPEER, Mich. (AP) — For more than 20 years, the eastern Michigan town of Lapeer sent leftover sludge from its sewage treatment plant to area farms, supplying them with high-quality, free fertilizer while avoiding the expense of disposal elsewhere.

But state inspectors ordered a halt to the practice in 2017 after learning the material was laced with one of the potentially harmful chemicals known collectively as PFAS, which are turning up in drinking water and some foods across the U.S.

Downloaded on Jan 9, 2020 from: https://www.greatlakesnow.org/2019/09/concerns-michigan-pfas-sewage-sludge-croplands/

Are there PFAS in biosolids? If so, at what levels are they found in biosolids?

PFAS have been found in some biosolids. If PFAS are present in household sewage or industrial wastewater, they can make their way to the wastewater treatment plant. From there they can concentrate during the production of biosolids. Some biosolids have been sampled across the United States for PFAS. There currently are no standards for PFAS concentrations in biosolids for land application. Historically it has been the role of the US Environmental Protection Agency (USEPA) to establish land application criteria. The DEQ and MPART have identified establishing appropriate PFAS criteria as a priority and have requested the USEPA to develop criteria as soon as possible.

Downloaded on Jan 9, 2020 from: https://www.michigan.gov/pfasresponse/0,9038,7-365-86704_89705---,00.html

Implications for wastewater treatment plants

EPA PFAS Action Plan (2019)

Key EPA Actions Addressing PFAS-Related Challenges

- Expand toxicity information for PFAS
- Develop new tools to characterize PFAS in the environment
- Evaluate cleanup approaches
- Develop guidance to facilitate cleanup of contaminated groundwater
- Use enforcement tools to address PFAS exposure in the environment and assist states in enforcement activities
- Use legal tools such as those in TSCA to prevent future PFAS contamination
- Address PFAS in drinking water using regulatory and other tools
- Develop new tools and materials to communicate about PFAS

Short-Term Actions			
Understanding and Addressing PFAS Toxicity and Occurrence			
Establish and curate a clearinghouse of chemical information for PFAS	The EPA's CompTox Chemistry Dashboard has been updated to include several curated lists of PFAS chemicals with links to known chemical, physical, and other properties.	Provide simple access to a comprehensive array of up-to-date information for PFAS of interest.	Ongoing
Expand analytical methods to accurately test for additional PFAS in drinking water	Expand the current drinking water Method 537 to include GenX chemicals and additional PFAS; develop a new drinking water method for additional short-chain PFAS not measured by Method 537.	Improved and/or additional methods would help stakeholders and the EPA accurately test, analyze, and quantify a broader suite of PFAS in their drinking water, including GenX chemicals and other short-chain PFAS.	Method 537.1 completed November 2018; additional methods in 2019
Test for PFAS and PFAS precursors in media other than drinking water	Develop and validate methods for other water matrices (wastewater, surface waters, groundwater), solids (soil, sediment, biosolids, fish tissue), and air (ambient, stack emission, off-gases).	Provide additional methods for stakeholders and the EPA to identify the presence of PFAS in concentrations of concern for media other than drinking water.	2019 – 2021

Downloaded on Jan 9, 2020 from: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf

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Implications for wastewater treatment plants
MPCA 2020 Biosolids Project

Environment and Natural Resources Trust Fund (ENRTF)
2020 Main Proposal Template

PROJECT TITLE: Developing strategies to manage PFAS in land-applied biosolids

I. PROJECT STATEMENT

This project helps municipal wastewater plants, landfills, and compost facilities protect human health and the environment by developing strategies to manage per- and polyfluoroalkyl substances (PFAS) in land-applied biosolids.

Outcome	Completion Date
1. MPCA completes administration of competitive RFP to identify project consultant	March 2021
2. Deliverable of best management practices report to MPCA	June 30, 2023

Minnesota Pollution Control Agency. (2020, January 9). Environmental and Natural Resources Trust Fund 2020 Request for Proposals. Proposal "Developing Strategies to Manage PFAS in Land-Applied Biosolids". Retrieved from https://www.lccmr.leg.mn/proposals/2020/originals/098-b.pdf

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Implications for wastewater treatment plants
Water quality concerns

- In addition to the recent biosolids issues, there are continuing developments on water quality issues

- Water quality concerns and the regulatory process to address them, under some scenarios, could result in effluent limits

- MCES has accomplished order of magnitude cost estimates of the implications of effluent limits. Initial cost projections are:
  - Hundreds of millions of $’s in capital cost
  - Tens of millions of $’s/year in operation and maintenance cost

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MCES activities

- MCES monitors, reviews, and communicates with MPCA on PFAS water quality issues to understand and participate in activities relevant to our effluent discharge limit

- We have quarterly effluent PFAS monitoring requirements in the permits of 4 plants: Blue Lake, Eagles Pt., Metro, and Seneca

- Approved sampling and analytical methods are not developed for wastewater and biosolids. We have carried out research to better understand the limitations and problems involved in measuring these compounds

- We are active with our professional organizations and peer agencies and have identified several collaborative research projects that will help us and the industry address PFAS

- Our Industrial Waste/Pollution Prevention division (IWPP) is active in PFAS source identification and monitoring

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MCES IWPP Activities

- 2009 survey of a targeted group of metal finishers and other dischargers

- 2010 MPCA officially identified PFOS as a pollutant of concern for Metro Permit,
  - MCES expanded source identification efforts by sending PFC inventory forms to all permitted industrial dischargers
  - Began discussing PFC reductions during industrial inspections
  - Instituted PFC monitoring requirements for 41 landfills that use the Metro Plant for leachate disposal
  - Annual MCES sampling for PFOS at selected industrial dischargers was begun, as was annual PFC monitoring at the Metro Plant

- Required one permitted metal finishing industry with significant PFOS discharge concentrations to develop and implement a PFOS reduction plan, and to conduct quarterly monitoring to verify PFOS reductions

- PFAS are included in the Local Limit Evaluation process (every 5 years)
  - In the last local study (2016), Empire was the closest to having a PFOS local limit.
  - SKB Landfill was the only known industrial discharger, so induvial permit action was taken

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MCES IWPP Activities (continued)

- After a permitted groundwater remediation site installed an activated carbon system in 2010 to reduce its PFOS discharge by over 90%, MCES required ongoing operation of the pretreatment system and monthly PFOS monitoring

- MCES denies requests to discharge Aqueous Film-Forming Foam (AFFF), unless the requestor can document that the fire-fighting foam contains no PFAS

- Has and continues PFAS monitoring requirements at all landfill permits, the Douglas Corporation permit and the 3M Oakdale groundwater remediation site

- In 2017 email surveyed the hospitals in our service area asking:
  - If they have a helipad on site,
  - If so, does it have a fire suppression system
  - If so, is the fire suppression system tested periodically
  - If so, are there chemicals used in the system
  - If so, do they contain PFAS
  - How are the fire suppression chemicals managed?

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Industry Engagement

NACWA and others have recognized the risks of PFAS and produced fact sheets outlining the industry's concerns

https://www.nacwa.org/docs/default-source/resources---public/national-pfas-fact-sheet-developed-by-pfas-receivers.pdf?sfvrsn=4

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Summary

- Contaminants of emerging concern can potentially have significant impacts on wastewater treatment plants
- PFAS concerns may have implications for both our effluent and biosolids
- We receive these compounds, we do not produce them, and they are not destroyed or captured in our existing processes, so **source control is key**
- On-going Minnesota state activities with respect to PFAS directly impact MCES

  MCES is actively monitoring, commenting on, and participating, as appropriate, on the activities
- MCES has an active and robust Industrial Waste/Pollution Prevention department engaged on PFAS
- PFAS issues impact the whole wastewater industry, and its professional organizations are actively engaged. There is support information and resources available

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Questions

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