

PFAS Sampling Considerations



- Main concern is with cross-contamination of PFAS in the sampling environment
 - PFAS are ubiquitous
 - Low (i.e. ppt) standards
 - Much of our typical sampling equipment and items in the sampling environment contain or may contain PFAS
 - Little published research on how certain materials may affect sample results
- Refer to MI EGLE PFAS Sampling Guidance for appropriate and prohibited materials for sampling and personal protection
- **Conservative approach is recommended**
 - When in doubt, collect field, equipment, trip blanks
 - Also advisable to collect sample duplicates



Formally-established PFAS Laboratory Analysis Standards

- EPA Method 537.1 Rev 1.1
 - Drinking water method last updated November 2018
 - Includes 18 PFAS analytes
 - Requires Field Reagent Blank for additional QA/QC
- ISO Method 25101
 - Method for unfiltered samples of drinking water, groundwater, and surface water
 - Used for PFOS and PFOA
- ASTM D7979
 - Used in surface water, sludge, and wastewater for select PFAS
- ASTM D7968
 - Used for perfluorinated substances (not exhaustive PFAS list)
 - “Quick and dirty” method



PFAS Laboratory Analysis to be Established

- **Some labs have “Modified” EPA Method 537**
 - Includes isotope dilution, not typically sanctioned by EPA
 - Used for other media (i.e. groundwater, soil, etc.)
 - Requires Field Reagent Blank for additional QA/QC
- EPA working on additional PFAS methods for release in 2019
 - EPA 8237: non-drinking water, 24 PFAS compounds
 - EPA 8238: non-drinking water/POTW influent/biosolids/soils/DoD sites, 24 PFAS + GenX
 - New drinking water method for shorter chain PFAS outside EPA Method 537 Scope



AGENDA

- 1 Introduction to PFAS
- 2 PFAS Health Effects and Regulations
- 3 PFAS Sampling and Laboratory Analysis Considerations
- 4 Landfill Considerations
- 5 Recommended Resources



PFAS in Landfills

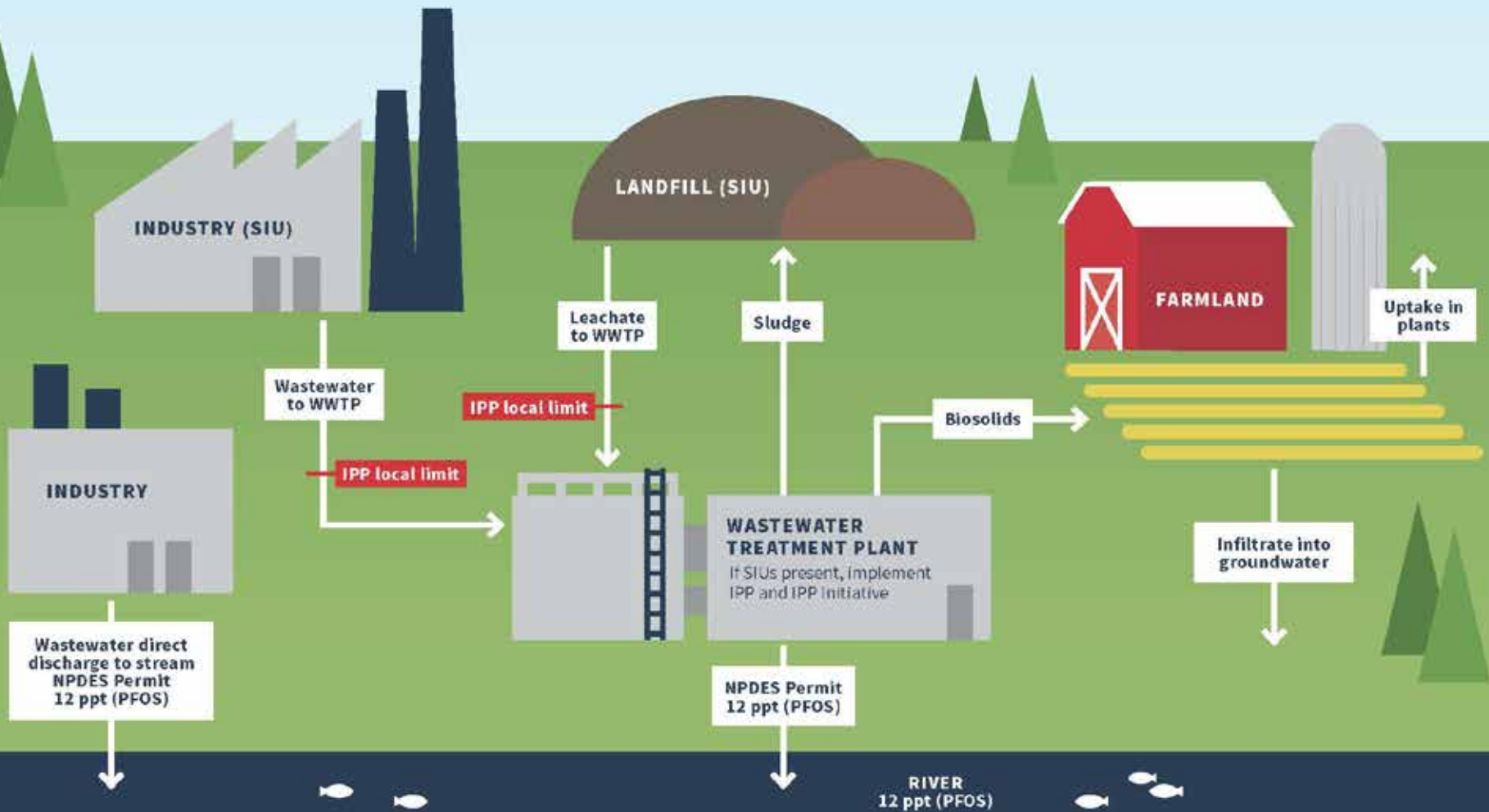


- Sources
 - PFAS-impacted industrial waste
 - Sewage sludge from wastewater treatment facilities
 - Waste from site mitigation
 - PFAS-bearing consumer wastes
 - Any industrial, commercial, and consumer products landfilled since the 1950s
- PFAS composition and concentration
 - Shorter-chain PFAS tends to dominate
 - Concentration depends on type of landfill, waste stream accepted, and local industries



PFAS Water Cycle

IPP = Industrial Pretreatment Program
SIU = Significant Industrial User
NPDES = National Pollutant Discharge Elimination System
PPT = Parts Per Trillion
WWTP = Wastewater Treatment Plant



Source: Michigan EGLE, September 2018



Landfill Considerations



- Lined or unlined?
 - Impacts are harder to control in an unlined landfill
- What material is used for daily cover or alternate daily cover?
 - Sludge, sludge-derived products, shredded automotive parts, spray-on foams may contain PFAS
- How is the leachate processed?
 - WWTP is common, but WWTP technologies are generally ineffective at treating PFAS or might exacerbate the issue
- Age of waste?
 - PFAS will be released at slow but steady rates (i.e. decades) following initial placement
 - May take PFAS several years to reach leachate



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Recommended Resources and References



- ITRC Fact Sheets on PFAS
 - Great for PFAS background, evolving technologies, sampling and analysis, etc.
 - Regulations fact sheet is updated every 6 weeks
- MI EGLE PFAS Sampling Guidance
 - Great for allowable sampling and analysis practices
- MI EGLE PFAS Website
- Free webinars
- USEPA PFAS Website
- Qualified environmental professionals



Uncertainties and Evolving Policies

- Toxicity and risk assessment
- Regulations
- Sampling techniques
- Analysis procedures
- Fate and transport
- Treatment
 - Especially when multiple contaminants are present
 - Long term efficacy



Thank you!

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Consulting
Engineers and
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Questions?

wastewater field waste Guidance
Concentration Shorter-chain recommended
products since MDEQ
items sampling
sludge-derived treatment PFAS-bearing commercial affect
spray-on Sources ineffective local Much
rates industrial Sewage materials
leachate wastes technologies landfilled stream
daily facilities cover Sludge
standards Any processed ppt Age years generally
approach tends PFAS automotive steady
Low dominate released several
issue used material composition blanks protection
collect results typical type published Lined site
ubiquitous reach WWTP following
exacerbate landfill GenX PFAS-impacted
personal equipment mitigation
Refer concern environment certain
accepted unlined foams
sample placement
research shredded prohibited Conservative
treating initial slow
appropriate consumer
cross-contamination