EPA Biosolids Program 40 CFR Part 503

Biosolids Part 1: Overview of Wastewater Treatment Sludge and Clean Water Act Regulatory Structure Practice

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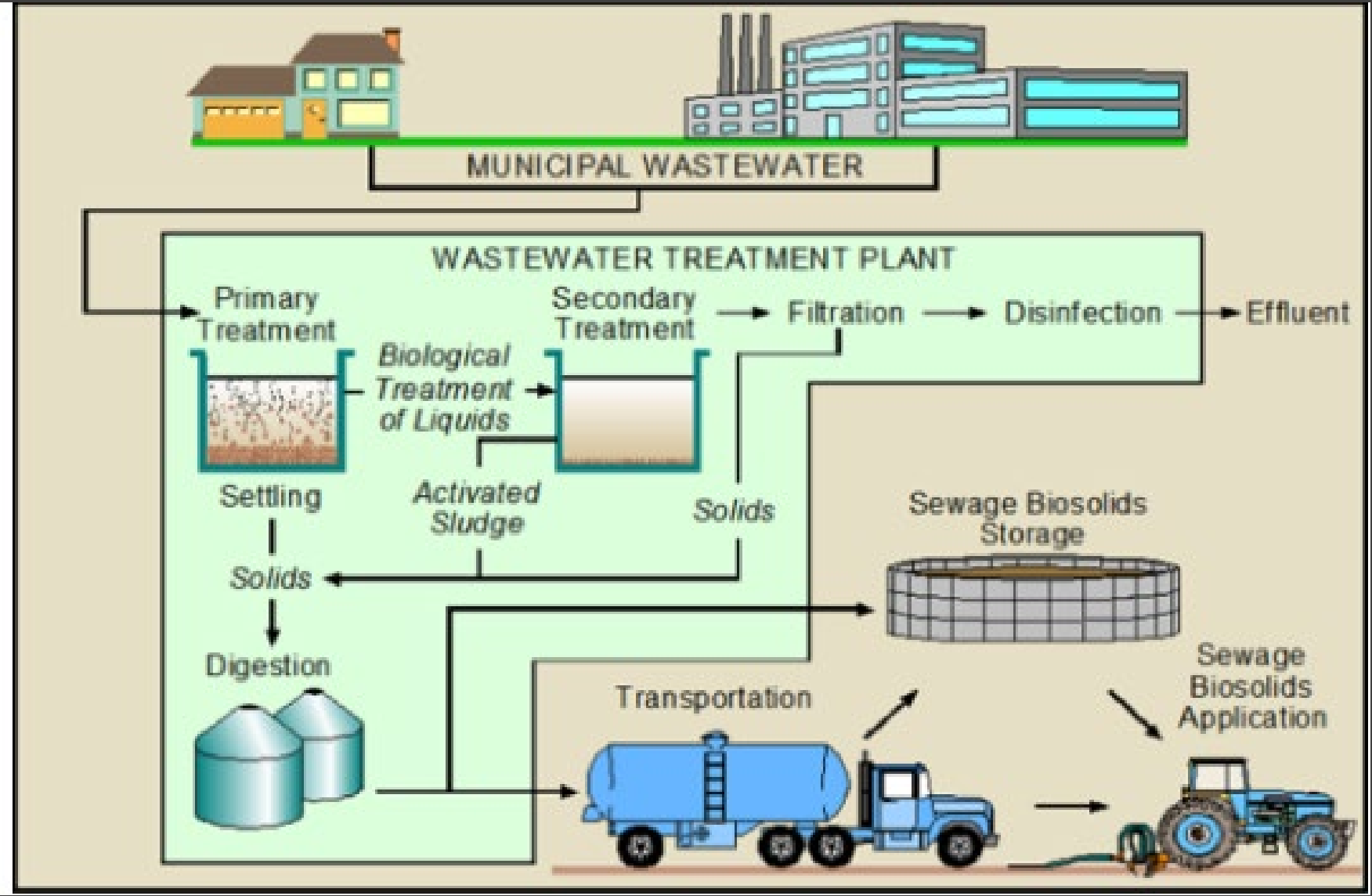
Office of Science and Technology, Office of Water

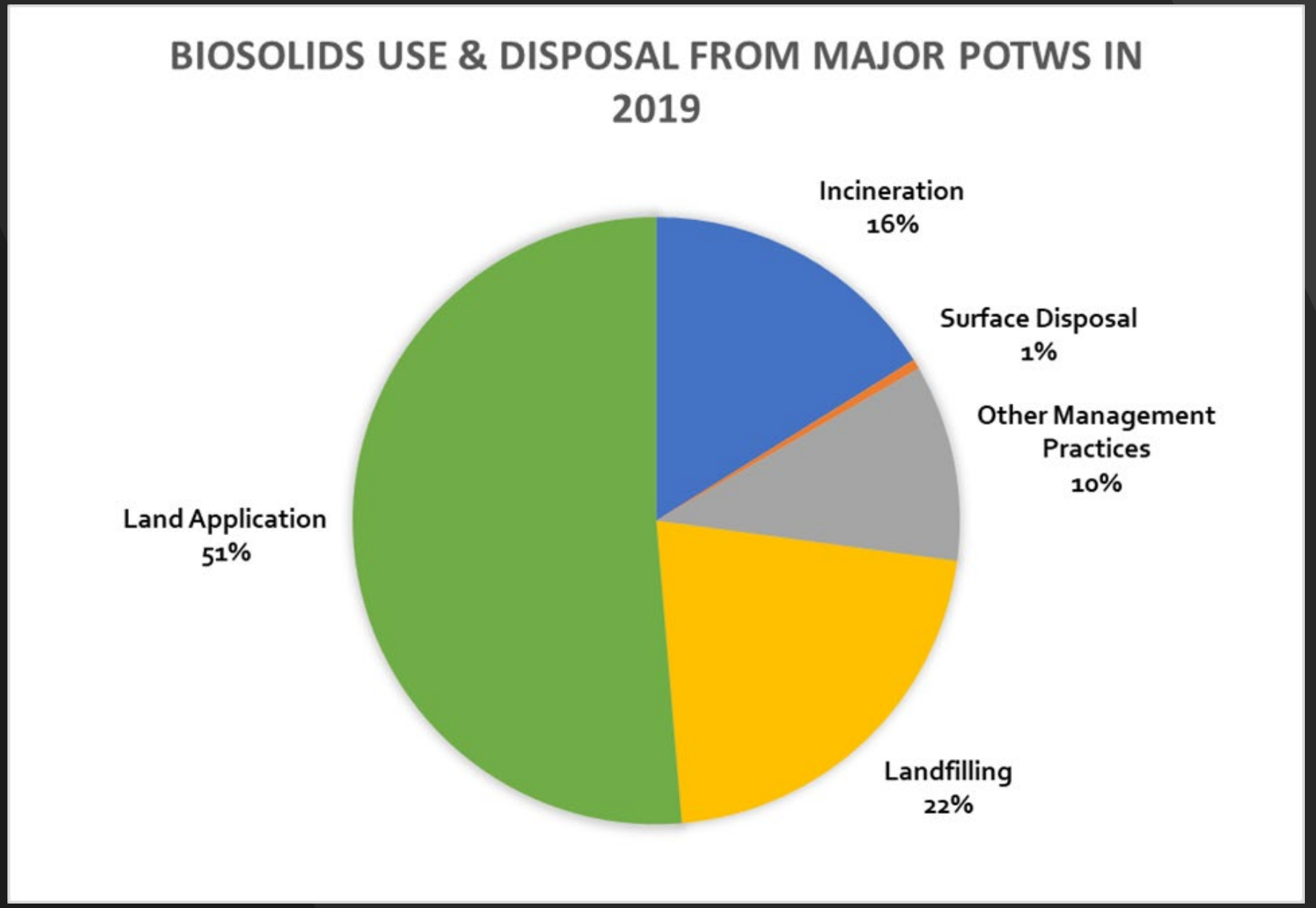
How are Biosolids Produced?



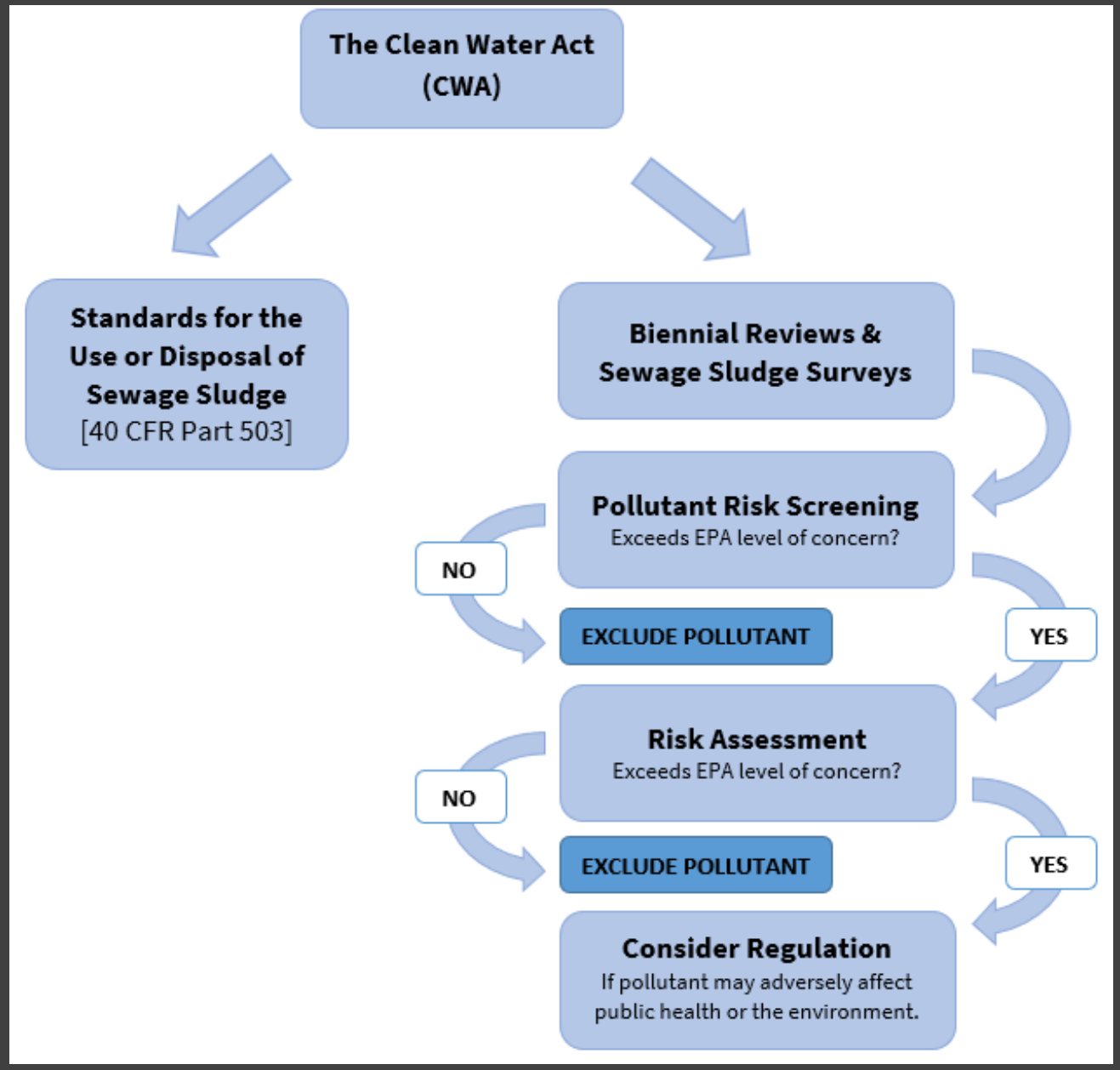
http://www.omafra.gov.on.ca/english/nm/nasm/info/brochure.htm

Biosolids Use

Statisticshttps://echo.epa.gov/



Clean Water Act Section 405(d) Requires EPA to:



Regulation

https://www.govinfo.gov/content/pkg/CFR-2018-title40-vol32/xml/CFR-2018-title40-vol32-part503.xml

- What does 40 CFR Part 503, *Standards for the Use or Disposal of Sewage Sludge* regulate?
  - Sewage sludge
    - Solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works.
  - Domestic septage
    - The liquid or solid material removed from a septic tank cesspool, portable toilet, type III marine sanitation device, or similar system that receives only domestic septage (household, non-commercial, non-industrial sewage).

https://www.usgs.gov/media/images/central-wastewater-treatment-plant-nashville

Regulation

- Self-implementing rule
  - Federally enforceable without a permit.
- Several states have adopted Part 503 or something more restrictive.
  - Eight states formally delegated (SD, UT, OK, WI, TX, AZ, OH, MI).

https://dl.sciencesocieties.org/story/2016/sep/wed/soil-properties-drive-biosolids-effects-on-winter-wheat

Regulation

- The Part 503 rule establishes requirements for the final use or disposal of sewage sludge [biosolids] when biosolids are:
  - Placed on a surface disposal site.
  - Fired in a biosolids incinerator.
  - Applied to land.

https://www.westernvawater.org/wastewater-service/wastewater-treatment/biosolids-land-application

https://www3.epa.gov/region9/water/npdes/sludge.html

https://www.greensboro-nc.gov/departments/water-resources/wastewater-system/treatment-process/wastewater-biosolids-disposal

Polling Question #1

40 CFR Part 503

- Subpart C: Surface Disposal
  - Applicability § 503.20
  - Special definitions § 503.21
  - General requirements § 503.22
  - Pollutant limits § 503.23
  - Management practices § 503.24
  - Operational standards § 503.25
    - Pathogens § 503.32
    - Vector Attraction Reduction § 503.33
  - Monitoring § 503.26
  - Recordkeeping § 503.27
  - Reporting § 503.28

Surface Disposal

- Surface disposal: Biosolids are placed on an area of land for final disposal.
- Liners and leachate collection systems may be used to contain surface disposal sites.
- Types of surface disposal sites:
  - Monofills
  - Surface impoundments and lagoons
  - Waste piles
  - Dedicated disposal sites
  - Dedicated beneficial use sites
- Pollutant limits for: arsenic, chromium and nickel*.

http://burchhydro.com/Services/Biosolids-Stabilization

*Please note that pollutant limits differ for surface disposal, incineration, and land application.

40 CFR Part 503

- Subpart E: Incineration
  - Applicability § 503.40
  - Special definitions § 503.41
  - General requirements § 503.42
  - Pollutant limits § 503.43
  - Operational standard—total hydrocarbons § 503.44
  - Management practices § 503.45
  - Monitoring § 503.46
  - Recordkeeping § 503.47
  - Reporting § 503.48

Incineration

- Incineration: combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

- For incineration of biosolids, the combustion units are coupled with air pollution control devices (APCDs) to remove small particles and adhering metals in exhaust gas or further decompose organics.

- Biosolids can be fired in several different types of incinerators
  - **Sewage Sludge Incinerator (SSI):** an enclosed device in which only sewage sludge (and auxiliary fuel) are fired.
  - **Municipal Waste Combustor (MWC):** equipment that combusts municipal solid waste (co-combusted with biosolids).
  - **Waste-to-Energy:** conversion of non-recyclable waste materials into usable heat, energy or fuel (usually municipal waste combustors co-firing with biosolids).

Incineration

- 40 CFR Part 503 focuses on sewage sludge incinerators (SSIs)
- Commonly used SSIs:
  - Multiple hearth incinerators
  - Fluidized bed incinerators (pictured)

https://hankines.com/fluidized-bed-incinerators/

- Since 1988 (when EPA tracking started) the number of SSIs has decreased, however the amount of sewage sludge incinerated has stayed relatively steady between 16-20% (of sewage sludge generated).
  - The decreased number of SSIs is partly due to new Clean Air Act regulations.
  - Units have also become more efficient: 1 fluidized bed can replace 2 smaller multiple hearth incinerators.
    - Fluidized bed incinerators are generally better at meeting federal emission standards compared to multiple hearth, so most new installations use this technology.

Incineration: Part 503 and Beyond

- Incineration is regulated under 40 CFR Part 503, but other aspects of biosolids incineration are covered by additional regulations:
  - Disposal of ash generated during the firing of biosolids in an SSI is regulated under solid waste disposal requirements (40 CFR Parts 257, 258, & 261-258).
  - SSIs, MWCs and other solid waste incinerators are regulated under the Clean Air Act (40 CFR Part 60 & 62).

40 CFR Part 503

- Subpart B: Land Application
  - General requirements § 503.12
  - Pollutant limits § 503.13
  - Operational standards § 503.15
    - Pathogens § 503.32
    - Vector Attraction Reduction § 503.33
  - Monitoring § 503.16
  - Recordkeeping § 503.17
  - Reporting § 503.18
  - Management Practices § 503.14

Land application

- Land application: Biosolids are applied to land to condition the soil or fertilize crops or other vegetation grown in the soil.

- Biosolids can be applied in solid or liquid states via:
  - Spreading or spraying on soil surface
  - Tilling into soil after being surface applied
  - Injected directly below the surface

- Types of land that benefit from land application:

Nonpublic contact sites	Public contact sites
▪ Areas not frequently visited by the public. ▪ Examples: Agricultural land, forests, reclamation sites.	▪ Areas where people are likely to come into contact with biosolids applied to land. ▪ Examples: Public parks, plant nurseries, roadsides, golf courses, lawns, home gardens.

Pollutant Limits § 503.13

- Regulated pollutants: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Zinc*.

- Pollutant limits – all land applied biosolids must meet the *ceiling concentrations* for pollutants and must also meet either:
  - *Pollutant concentration limits*
  - *Cumulative pollutant loading rate*
  - *Annual pollutant loading rate*

- Pollutant limits are risk based.

*Please note that pollutant limits differ for surface disposal, incineration, and land application.

Pathogen Reduction § 503.32(a),(b)

- Pathogens: Microorganisms that cause disease, including some bacteria, viruses, protozoa, and other organisms.
- Pathogen reduction requirements:
  - Based on technological and microbiological requirements.
  - Indicator microorganisms evaluated : Salmonella sp., fecal coliforms, enteric viruses, viable helminth ova.
  - Level of pathogen reduction distinguishes Class A biosolids from Class B biosolids.

Class A Biosolids	Class B Biosolids
▪ Goal is to reduce pathogens below detectable limits. ▪ Applied to lawns and home gardens, sold or given away in bags or other containers.	▪ Goal is to reduce pathogens to levels that are unlikely to pose a threat to public health and the environment under specific use conditions. ▪ Applied to agricultural and non-agricultural land (e.g., forest, public contact sites, surface disposal sites and reclamation sites).

Pathogen Equivalency Committee (PEC)

- PEC provides technical assistance and recommendations on process equivalencies for pathogen reduction in sewage sludge to government and industry.

- Ensures that new processes employed for sewage sludge treatment are robust and effective in pathogen reduction.

- Reviews and makes recommendations to federal and/or state permitting authorities on applications proposing new innovative or alternative sewage sludge pathogen reduction processes.

https://www.epa.gov/biosolids/pathogen-equivalency-committee

Vector Attraction Reduction § 503.33

- Vector: A living organism (such as a fly or mosquito) that transmits infectious diseases between humans or from animal to human.
- Two ways to achieve Vector Attraction Reduction:

Reduction through Treatment	Reduction through Barriers
▪ Treatments are operating conditions or tests to demonstrate that vector attraction has been reduced in biosolids. ▪ Examples: Aerobic and anaerobic digestion, composting, alkali addition, drying, elevated pH (domestic septage only).	▪ Soil is used as a physical barrier to prevent vectors from coming in contact with land applied biosolids. ▪ Examples: injection of biosolids below land surface, incorporation of biosolids into soil, placement of a cover over biosolids.

Options for Meeting Federal Pollutant Limits, Pathogen Requirements, and Vector Attraction Reduction for Land Application of Biosolids

	Pollutant Limit Requirement § 503.13 (a)(1) and (b)(1)-(b)(4)		**Pathogen Requirements** § 503.32 (a)(3)-(a)(8), (b)(2)-(b)(4)	**Vector Attraction Reduction Requirement** § 503.33 (b)(1)-(b)(10)
Class A Exceptional Quality (EQ)	**Ceiling Concentrations** (a)(1)	**Pollutant Concentration** (b)(3)	**Any Class A Alternative** (a)(3)-(a)(8)	**Any Alternative 1-8** (b)(1)-(b)(8)
Class A	**Ceiling Concentrations** (a)(1)	**Pollutant Concentration** (b)(3)	**Any Class A Alternative** (a)(3)-(a)(8)	**Alternative 9 or 10** (b)(9) or (b)(10)
		Cumulative Pollutant Loading Rates (b)(2)		**Any Alternative 1-10** (b)(1)-(b)(10)
		Annual Pollutant Loading Rates (b)(4)		**Any Alternative 1-8** (b)(1)-(b)(8)
Class B	**Ceiling Concentrations** (a)(1)	**Pollutant Concentration** (b)(3)	**Any Class B Alternative** (b)(2)-(b)(4)	**Any Alternative 1-10** ((b)(1)-(b)(10)
		Cumulative Pollutant Loading Rates (b)(2)		**Any Alternative 1-10** (b)(1)-(b)(10)

Polling Question #2

EPA's Biosolids Program What's New

- EPA Website https://www.epa.gov/biosolids
- Read the Biosolids Biennial Report No 8 (Reporting Period 2018-2019) and Fact Sheet
- Read the Summary of the EPA Nationals Biosolids Meeting 2020
- Read the Summary of the EPA Biosolids PFOA & PFOS Problem Formulation Meeting
- Register EPA Biosolids Webinar Series

Thank you!

- Please visit:
  www.epa.gov/biosolids
- Contact:
  - Liz Resek resek.elizabeth@epa.gov
  - Tess Richman richman.tess@epa.gov
  - Lauren Questell questell.lauren@epa.gov

EPA Biosolids Center of Excellence

U.S. EPA REGION 7 – KANSAS CITY

SETH DRAPER

ENFORCEMENT COMPLIANCE AND ASSURANCE DIVISION

Polling Question #1

Table of Contents

I. Biosolids Center of Excellence

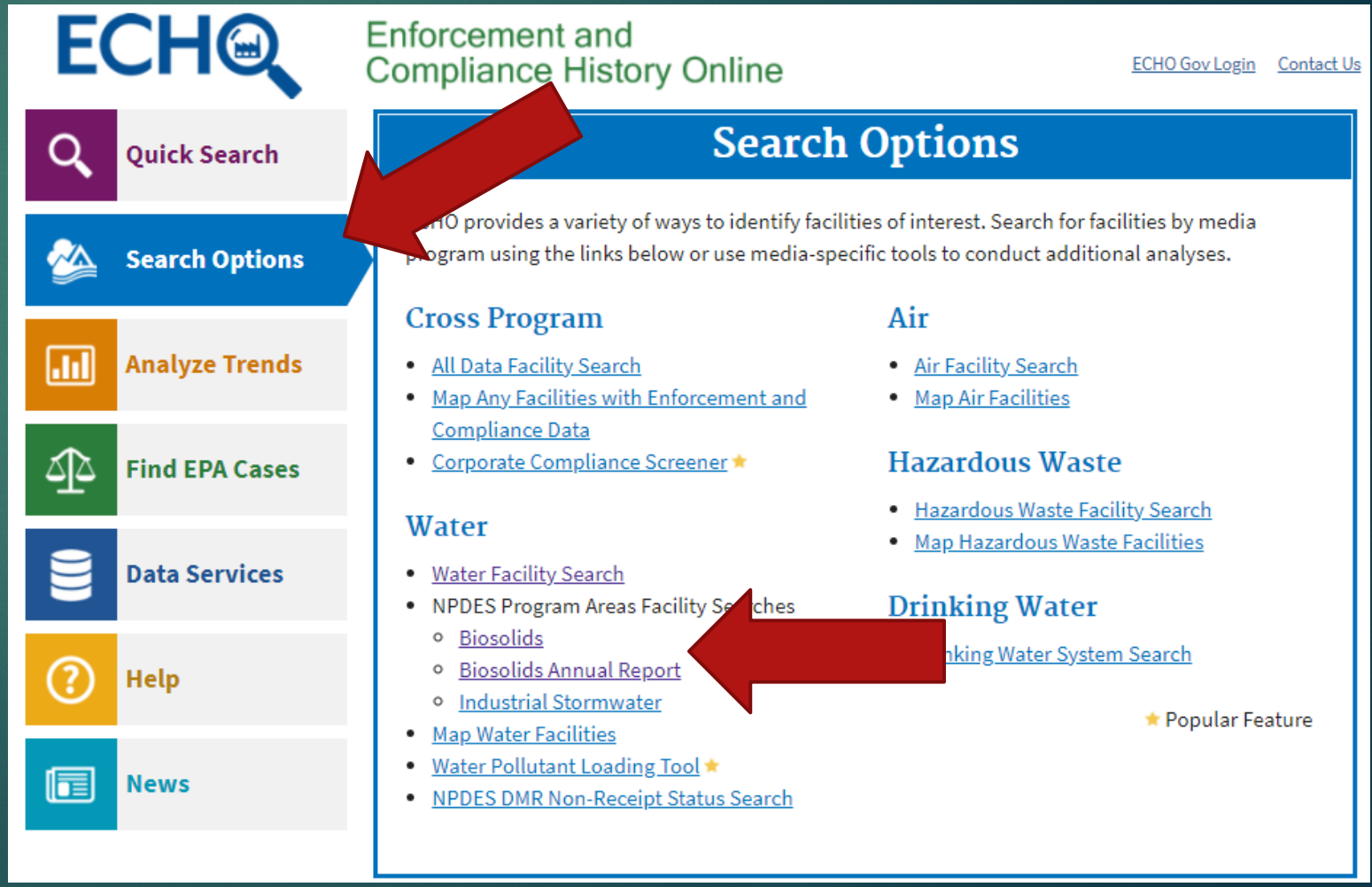
- EPA Region 7 delegated authority on December 23, 2015
- Biosolids Coordinator - enforcement and compliance staff
- Electronic Reporting (E Reporting Rule) – electronic submittal
- Annual report reviews
- Informal and Formal Enforcement

Polling Question #2

II. Environmental Compliance History Online (ECHO)

- Data clearinghouse
- Program Data
- Facility Specific Compliance Data
- Annual Reports

- https://echo.epa.gov/
- https://echo.epa.gov/help/training



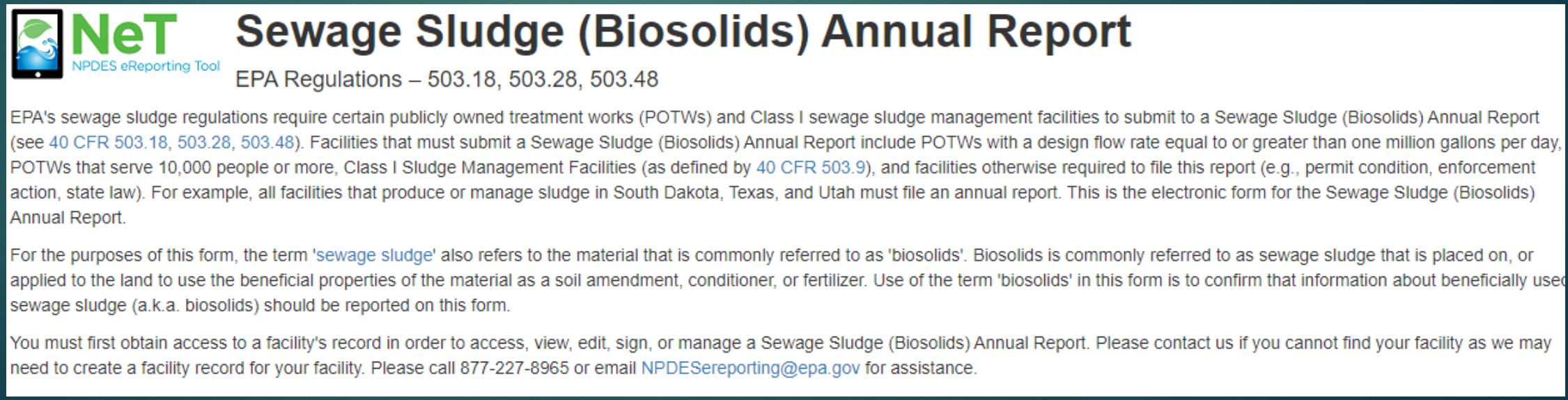
Polling Question #3

III. Electronic Reporting Rule

- Published October 22, 2017
- Paper Reports no longer accepted
- Central Data Exchange (CDX) – report submittals
- CDX Help Desk
  - Contact - 877-227-8965
  - Email - NPDESeReporting@epa.gov
- EPA Region 7 Biosolids Center Coordinator –
  - Seth Draper
  - Draper.Seth@epa.gov
  - 913-551-7080

IV. Biosolids Report Review

- Biosolids Center staff screen for non-compliance
- Follow up emails or phone calls
- Information Requests: Clean Water Act Section 308
- Biosolids Inspections: CWA Section 308



NeT
NPDES eReporting Tool

Sewage Sludge (Biosolids) Annual Report

EPA Regulations – 503.18, 503.28, 503.48

EPA's sewage sludge regulations require certain publicly owned treatment works (POTWs) and Class I sewage sludge management facilities to submit to a Sewage Sludge (Biosolids) Annual Report (see 40 CFR 503.18, 503.28, 503.48). Facilities that must submit a Sewage Sludge (Biosolids) Annual Report include POTWs with a design flow rate equal to or greater than one million gallons per day, POTWs that serve 10,000 people or more, Class I Sludge Management Facilities (as defined by 40 CFR 503.9), and facilities otherwise required to file this report (e.g., permit condition, enforcement action, state law). For example, all facilities that produce or manage sludge in South Dakota, Texas, and Utah must file an annual report. This is the electronic form for the Sewage Sludge (Biosolids) Annual Report.

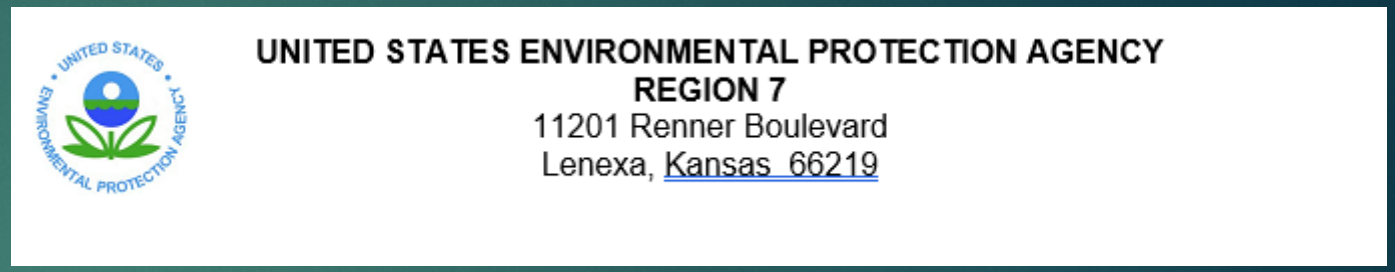
For the purposes of this form, the term 'sewage sludge' also refers to the material that is commonly referred to as 'biosolids'. Biosolids is commonly referred to as sewage sludge that is placed on, or applied to the land to use the beneficial properties of the material as a soil amendment, conditioner, or fertilizer. Use of the term 'biosolids' in this form is to confirm that information about beneficially used sewage sludge (a.k.a. biosolids) should be reported on this form.

You must first obtain access to a facility's record in order to access, view, edit, sign, or manage a Sewage Sludge (Biosolids) Annual Report. Please contact us if you cannot find your facility as we may need to create a facility record for your facility. Please call 877-227-8965 or email NPDESereporting@epa.gov for assistance.

Polling Question #4

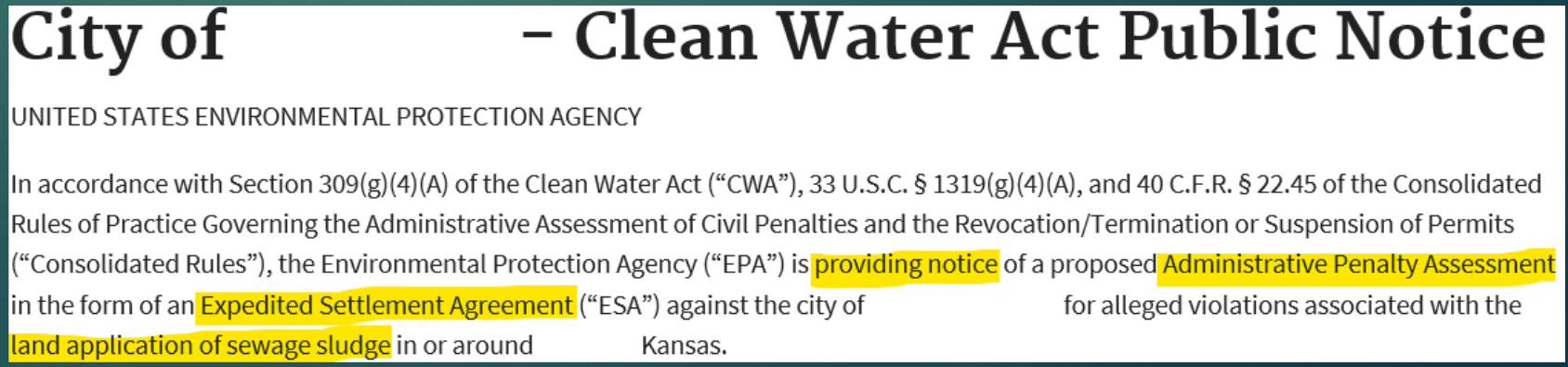
V. Examples of Non-compliance

- Enforcement
  - Informal –
    - Letters of Warning
    - Notice of Violation
  - Formal Enforcement –
    - Expedited Settlement Agreement (2019);
    - Administrative Orders (Unilateral / Consent);
    - Administrative Penalty Orders
- Judicial Referrals – Department of Justice



VI. 2019/2020 Enforcement Actions

- Non-compliance Trends
  - Ceiling Limit Exceedances
  - Agronomic Rate Exceedances
  - Improper Sampling Frequency
  - Specific Oxygen Uptake Rate (SOUR) Exceedances
  - Lesson Learned: Sample – Review Results – Then conduct Land Application
- Letters of Warning
- Penalties Issued
- Press Releases



City of – Clean Water Act Public Notice

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In accordance with Section 309(g)(4)(A) of the Clean Water Act ("CWA"), 33 U.S.C. § 1319(g)(4)(A), and 40 C.F.R. § 22.45 of the Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits ("Consolidated Rules"), the Environmental Protection Agency ("EPA") is providing notice of a proposed Administrative Penalty Assessment in the form of an Expedited Settlement Agreement ("ESA") against the city of for alleged violations associated with the land application of sewage sludge in or around Kansas.

Questions for the Biosolids Center?

VIII. Contacts

- Seth Draper
  Environmental Compliance and Assurance Division/Water Branch
  11201 Renner Blvd
  Lenexa, KS 66219
  913-551-7080
  Draper.Seth@epa.gov

- https://www.epa.gov/biosolids/epa-regional-and-state-contacts-biosolids

NeT Zendesk

- NeT Zendesk URL - https://epanet.zendesk.com

- User Guide
  - Intro to EPA Biosolids eReporting
  - How to gain access to your NPDES ID
  - How to access Biosolids Annual Report (NETBIO)

- Quick Start Guide
  - 4 Step Process

NeT Zendesk (contd.)

- GovDelivery:
  - Permittees List (Public)
- Training Schedule
- Articles
  - How to change your Roles in CDX
  - CDX Roles for NETBIO

Quick Start Guide

Four Steps:

1. Create or Log into your CDX Account
2. Create New NPDES ID or Request Access to existing NPDES ID for Biosolids Reporting
3. Create/Fill Out Biosolids Report
4. Sign and Submit Biosolids Report

Step 1: Create or Log into CDX Account

CDX URL - (https://cdx.epa.gov/)

- New CDX User
  - Visit NeT Zendesk How to Create CDX Account
- Existing CDX User but does not have access to NETBIO
  - Visit NeT Zendesk How to add NETBIO Program Service
- Has access to NETBIO but with the wrong role
  - Visit NeT Zendesk How to Change Your Role in CDX

Step 2: Find/Create New NPDES ID

- How to find/create your Permit number for Biosolids Report:
  - Call Center at 1-877-227-8965 (toll-free)
  - Email to **NPDESeReporting@epa.gov**

- Request Access to existing NPDES ID for Biosolids Reporting – Recording of previous training

Step 3: Create/Fill out Biosolids Report

Step 4: Sign/Submit Biosolids Report

Both can be found in the Recording of previous training.

Resources

- CDX Assistance
  - Forgot CDX Password: https://cdx.epa.gov/PasswordReset/GetResetCode
  - Forgot CDX User ID: https://cdx.epa.gov/AccountRecovery/ForgotUserId
- NPDES eReporting Website: **https://www.epa.gov/compliance/npdes-ereporting**
- Biosolids Online Resources: **https://epanet.zendesk.com**
  - Biosolids User Guide
  - Sample Paper Form (PDF)
  - CDX Roles and How to Change Your Roles in CDX
- Biosolids Annual Program Report Assistance
  - Call Center at 1-877-227-8965 (toll-free)
  - Email to **NPDESeReporting@epa.gov**
- Biosolids Annual Report Contact List: https://epanet.zendesk.com/hc/en-us/articles/360060055254-Biosolids-Annual-Report-Contact-List