



Recognizing A Resource:

bi  ***s***  ***olids***

**A Roadmap for State & Regional Biosolids
Coordinators
and other interested parties**

**Part 1:
Federal & State Regulations**

This and the other parts of this presentation are available at
<http://www.wef.org/Biosolids/page.aspx?id=7522>



Audience

This presentation is intended for:

- U.S. EPA biosolids program staff
- U.S. EPA regional biosolids coordinators
- State biosolids regulatory agency staff (e.g. state biosolids coordinators)
- Managers of biosolids
- Wastewater treatment facility staff
- Biosolids program design engineers
- Distributors & users of biosolids products
- Other interested parties

Purpose

This presentation is intended to:

- Summarize the history and current status of federal and state biosolids regulations in the United States (U.S.)
- Summarize the state of the science & experience with biosolids management
- Summarize current trends & what can be expected in the future

So that all involved in setting policy & regulations and implementing biosolids management programs ***recognize this resource.***

Sustainable biosolids management requires maximizing the utilization of resources in biosolids and minimizing landfill disposal & combustion without energy recovery.

Contents

This presentation, produced by the National Biosolids Partnership, consists of the following 3 parts:

Part 1: Federal & State Regulations (presented here)

- ▶ **Summary of the Federal Part 503 Regulation**
- ▶ **Other Applicable Federal Regulations, Guidance, & Policies**
- ▶ **State Biosolids Regulations**
- ▶ **State Programs to Reward Environmental Excellence**
- ▶ **Conclusions:** Regulations are mature, Challenges, What's at stake?, How biosolids managers can help

Part 2: 40+ Years of Research & Experience (see separate file)

Part 3 (see separate file):

- ▶ Trends & Drivers in Biosolids Management
- ▶ Focusing on *Resource Recovery*



Happy 20th Birthday
40 CFR Part 503!
February 1993 – February 2013

The U.S. EPA Part 503 Rule

- **Summary of Part 503 – requirements & standards**
- **20 years of Part 503**
- **Current efforts & looking ahead**



Summary of Part 503

The Clean Water Act (CWA)

(amendments of 1987)

Section 405 of the Clean Water Act sets the framework for sewage sludge (biosolids) regulations (i.e., Part 503)

- Requires EPA to establish standards for proper treatment, use, and disposal of sewage sludge.
- “To protect public health and the environment from any reasonably anticipated adverse effects of certain pollutants that might be present in sewage sludge biosolids.”
- Also requires EPA to conduct biennial reviews to determine if additional pollutants should be regulated.



Summary of Part 503

Standards for the Use or Disposal of Sewage Sludge

- Became effective in February 1993
- Sewage sludge = *Solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works*
- Minimum requirements for three management options:
 - ▶ Land application
 - ▶ Incineration
 - ▶ Surface disposal
- Indicates that sewage sludge placed in a municipal solid waste landfill must meet the provisions of 40 CFR Part 258.
- Self-implementing rule - Federally enforceable without a permit
- Essentially all states have adopted Part 503 or something more restrictive
 - Typically include additional requirements to address local factors
 - Eight states are formally delegated (UT, OK, SD, WI, TX, AZ, OH, MI)*; additional states still somewhat interested in delegation
- Choice of use or disposal practice is a local decision.

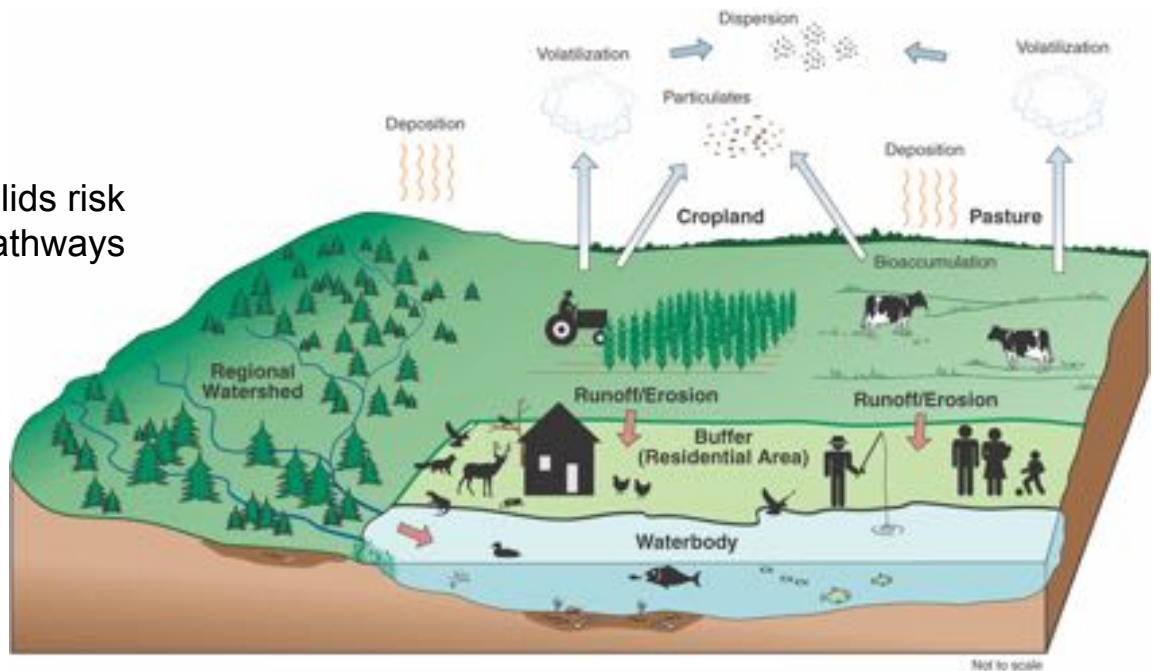
* States are authorized for different portions of Part 503; i.e. some exclude septage, others are authorized for land application but not incineration, etc.

Summary of Part 503

Biosolids Risk Assessment

- Mid-1970s – initial EPA biosolids risk assessment efforts began
- Late 1980s – comprehensive risk assessment (approved by EPA Sci. Advisory Board)
- Updated methods & conducted dioxins risk assessment in 2000s
- Continuing use in EPA's biennial reviews of pollutants identified for potential regulation when there is adequate data for risk assessment

Current biosolids risk assessment model & pathways



Summary of Part 503

Requirements and to whom they apply

- **Requirements focus on the generator, user, & disposer**
- **Requirements “are designed to work together to protect human health and the environment”**
 - ❑ General requirements
 - ❑ Numerical limits for certain pollutants
 - ❑ Management practices
 - ❑ Operational standards
 - ❑ Monitoring
 - ❑ Recordkeeping
 - ❑ Reporting



Summary of Part 503 – Land Application **Pollutants (heavy metals)**

- **Heavy metals limits**

- ✓ Risk based
- ✓ Arsenic, Cadmium, Chromium¹, Copper, Lead, Mercury, Molybdenum², Nickel, Selenium, Zinc

- **Regulatory limits**

- ✓ Ceiling concentration limits (CCL)
- ✓ Pollutant concentration limits (PCL)
- ✓ Cumulative pollutant loading rate (CLPR)
- ✓ Annual pollutant loading rate (APLR)



¹ 1995 amendment deleted land application limits

² 1994 amendment only retained CCL

Summary of Part 503 – Land Application

Pathogens & indicator organisms

- **Microbial standards**

- ✓ Technology based (pathogen risk assessments are being developed now)
- ✓ Representative pathogens & indicator organisms: *Salmonella* sp., fecal coliforms, enteric viruses, viable helminth ova

- **Class A biosolids standard:**

- ✓ <1000 fecal coliform MPN / g (dry weight) or
<3 *Salmonellae* MPN / 4 g (dry weight)
- ✓ <1 PFU enterovirus / 4 g (dry weight)
- ✓ <1 viable helminth ova / 4 g (dry weight)

- **Class B biosolids standard:**

- ✓ Use of a PSRP or equivalent process or
<2 million fecal coliform / g (dry weight)



Vector Attraction Reduction (VAR)

Must treat with one of ten VAR options, such as:

- Reduce the mass of volatile solids by a minimum of 38% (such as with anaerobic digestion)
- Add alkaline materials to raise the pH under specific conditions (e.g. to at least 12 for 2 hours and 11.5 for an additional 22 hours)
- Reduce moisture content to at least 75% or 90% solids (depending on level of wastewater treatment)
- Injection or immediate incorporation into soil (with specific requirements depending on level of pathogen treatment)



Summary of Part 503 – Land Application **EQ biosolids**

To qualify as EQ (exceptional quality):

- No regulated pollutant (e.g. heavy metal) shall exceed the pollutant (Part 503, Table 3) concentration.
- Must meet Class A pathogen reduction requirement.
- Must be treated by one of eight vector attraction reduction processes (injection and incorporation into soil do not count)
e.g 38% volatile solids reduction (VSR) or alkaline treatment

There are no general or label requirements for EQ biosolids.*

* unless established by EPA or a state on a case-by-case basis



Summary of Part 503 – Land Application

General requirements & management practices

APLR biosolids (not a common type):

- Label requirement regarding nitrogen (N) content and calculation of maximum annual application rate



For PC & CPLR biosolids (mostly Class B biosolids):

- Preparer must provide information regarding, and land applier must comply with, Part 503 land application requirements.
- No application to flooded, frozen, or snow-covered sites.
- No biosolids entering wetlands or other waters of the U. S.
- No application less than 10 meters from U. S. waters (unless otherwise permitted).
- Must be applied at rate equal to or less than the agronomic rate for N (exception permissible for reclamation sites).
- Must not harm threatened or endangered species or their critical habitat.
- CPLR biosolids sites must be tracked for accumulation of pollutants; no application allowed if any pollutant exceeds CPLR.

Summary of Part 503 – Land Application

Class B biosolids

Access restrictions

No public access until*...

- ≥ 30 days after application – when there is a low potential for exposure (e.g. private farmland)
- ≥ 1 year – when there is a high potential for exposure (e.g. turf)

No crop harvest until...

- ≥ 30 days after application for all food, feed, & fiber crops whose edible parts do not touch the soil
- ≥ 14 to 38 months after application, depending on type of food crop and the extent to which edible parts touch the soil

No grazing until...

- ≥ 30 days after application

Class B plus management requirements is as safe as Class A biosolids use.

* Public access restrictions do not apply to workers, i.e. land appliers, farmers



Summary of Part 503 – Land Application

Record-keeping

Records must be kept...

- by *preparer* of biosolids and
- by *applier* of biosolids (but preparer is ultimately responsible for the applier and their records)
- for 5 years (or indefinitely for CPLR biosolids)

Reporting required...

- for Class 1 treatment plants (WWTPs)
- WWTPs serving population of $\geq 10,000$
- WWTPs with ≥ 1 MGD design flow
- Annually by February 19th to EPA or state

Signed certification statement...

"I certify under penalty of law, that the [pathogen requirements, VAR requirements, management practices, site restrictions, requirements to obtain information] in [section number(s) in Part 503 for each requirement met] have been/have not been met.... I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment."

Chapter Two Land Application of Biosolids

TABLE 2-8
Recordkeeping and Reporting Requirements

Type of Biosolids	Records That Must Be Kept	Person Responsible for Recordkeeping		Records That Must Be Reported ⁴
		Preparer	Applier	
EQ Biosolids	Pollutant concentrations	✓		✓
	Pathogen reduction certification and description	✓		✓
	Vector attraction reduction certification and description	✓		✓
	Pollutant concentrations	✓		✓
EC Biosolids	Management practice certification and description		✓	
	Site restriction certification and description (where Class II pathogen requirements are met)		✓	
	Pathogen reduction certification and description	✓	✓	✓
	Vector attraction reduction certification and description	✓	✓	✓
CPLR Biosolids	Pollutant concentrations	✓		✓
	Management practice certification and description		✓	
	Site restriction certification and description (of Class II pathogen requirements are met)		✓	
	Pathogen reduction certification and description	✓	✓	✓
APLR Biosolids	Vector attraction reduction certification and description	✓	✓	✓
	Other information: — Certification and description of information gathered (information from the previous applier, landowner, or permitting authority regarding the existing cumulative pollutant load at the site from previous biosolids applications) — Site location — Number of hectares — Amount of biosolids applied — Cumulative amount of pollutant applied (including previous amounts) — Date of application		✓	✓
	Pollutant concentrations	✓		✓
	Management practice certification and description	✓		✓
	Pathogen reduction certification and description	✓		✓
	Vector attraction reduction certification and description	✓		✓
	The AWSAR for the biosolids	✓		✓

¹ Reporting responsibilities are only for POTWs with a design flow rate equal to or greater than 1 mgd. POTWs that serve a population of 10,000 or greater, and Class I sludge management facilities.

² The preparer certifies and describes vector attraction reduction methods other than injection and incorporation of biosolids into the soil. The applier certifies and describes injection or incorporation of biosolids into the soil.

³ Records that certify and describe injection or incorporation of biosolids into the soil do not have to be reported.

⁴ Some of this information has to be reported only when 90 percent or more of any of the CPLRs is reached at a site.

48 - EPA Guide to Part 503 Rule

Summary of Part 503

Surface Disposal

- Subpart C of Part 503
- Less common method of use or disposal of biosolids
- Applies to monofills, surface impoundments & lagoons (but not treatment lagoons), waste piles, dedicated disposal sites, etc.
- These regulations apply to storage or disposal sites where biosolids are on land longer than 2 years (< 2 years = storage).
- Standards include:
 - ❑ General requirements
 - ❑ Pollutant limits (As, Cr, Ni)
 - ❑ Management practices
 - ❑ Operational standards for pathogen reduction & VAR
 - ❑ Frequency of monitoring requirements
 - ❑ Recordkeeping requirements
 - ❑ Reporting requirements



Summary of Part 503 Incineration

- Subpart E of Part 503 applies to sewage sludge incinerators (SSIs)*
- If municipal solid waste is >30% (dry weight) of mixture, 40 CFR Parts 60 & 61 apply
- Incinerator ash is not covered by Part 503; see 40 CFR Parts 257 & 258
- Sets limits in combusted biosolids for: As, Be, Cd, Cr, Pb, Hg, & Ni.
- Sets limits on air emissions from SSIs for: total hydrocarbons, CO
- Management practices covered in Part 503, Subpart E:
 - ❑ Instrument operation & maintenance
 - ❑ Temperature requirements
 - ❑ Operation of air pollution control devices
 - ❑ Protect threatened & endangered species
 - ❑ Monitoring & record-keeping



* New EPA regulations adopted in 2011 under the Clean Air Act include additional requirements for SSIs. See details below.



20 Years of Part 503

See References at end of
slideshow for links to these
documents.

1993 – Part 503 becomes effective

1994 & 1995 – Minor revisions*

1996 – 1st NAS / National Research Council Review (of land application)

2001 - Dioxin assessment (EPA determines no need to regulate dioxins & related compounds in surface disposed or incinerated biosolids)

2002 – Office of Inspector General review (of EPA biosolids program)

2002 – 2nd NAS/ National Research Council Review (of land application)

2003 – EPA response to 2nd NAS review

2003 – Dioxin assessment (EPA determines no need to regulate dioxins & related compounds in land applied biosolids)

2003 – Interagency (ISCORS) reports on radioactivity in biosolids

2003, 2005, 2007, 2009 – Biennial reviews

2009 – Targeted National Sewage Sludge Survey (TNSSS) Report

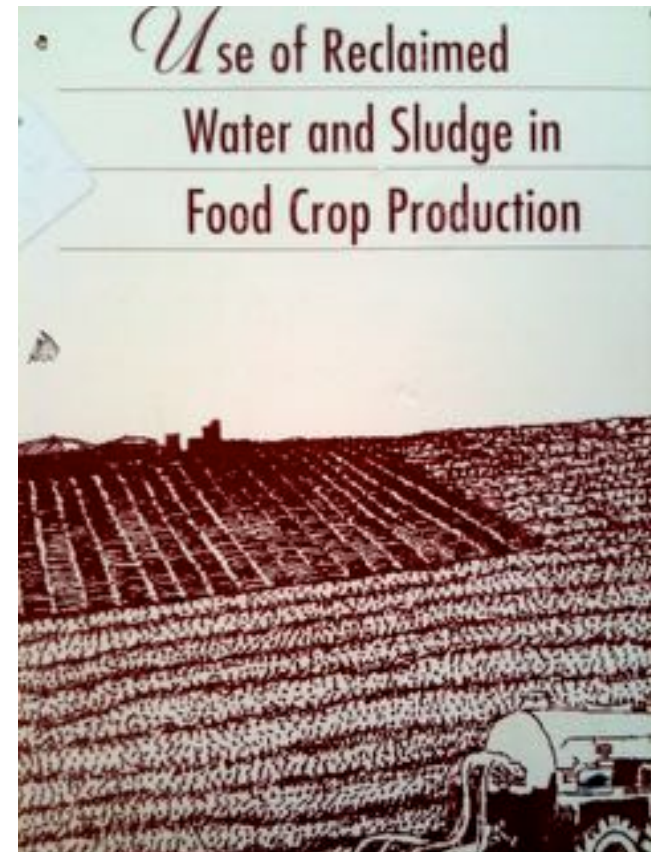
2011 – Biennial review (in process)

* For land application, Cr standard deleted from all tables and Mo deleted from Tables 2, 3, & 4.

20 Years of Part 503

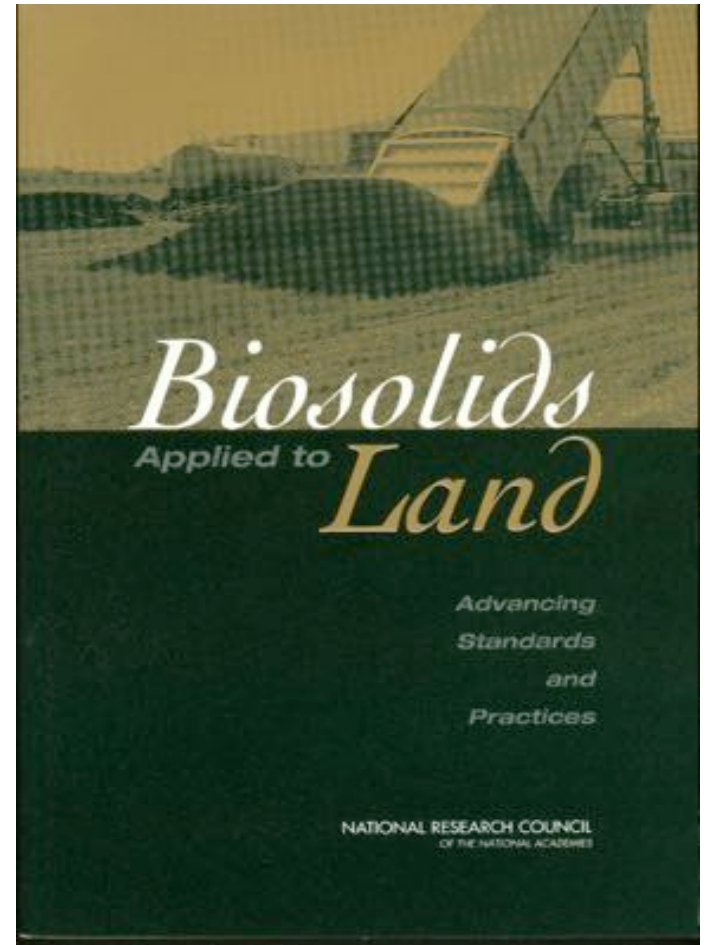
National Academy of Sciences (NAS) National Research Council Review, 1996

“In summary, society produces large volumes of treated municipal wastewater and sewage sludge that must be either disposed of or reused. While no disposal or reuse option can guarantee complete safety, the use of these materials in the production of crops for human consumption, when practiced in accordance with existing federal guidelines and regulations, present negligible risk to the consumer, to crop production, and to the environment.”



20 Years of Part 503
National Academy of Sciences (NAS)
National Research Council Review, 2002

“There is no documented scientific evidence that the Part 503 rule has failed to protect public health. However, additional scientific work is needed to reduce persistent uncertainty about the potential for adverse human health effects from exposure to biosolids.”



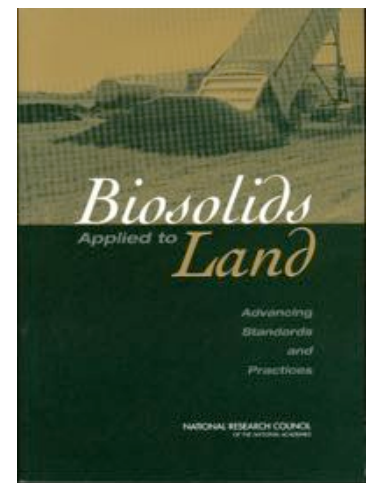
20 Years of Part 503

National Academy of Sciences (NAS)

National Research Council Review, 2002

EPA summarized “4 overarching recommendations”

- Use improved risk assessment methods to better establish standards for chemicals and pathogens
- Conduct a new national survey of chemicals and pathogens in biosolids
- Establish an approach to human health investigations
- Increase resources to the EPA’s biosolids program

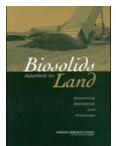


20 Years of Part 503

Current efforts & looking ahead...

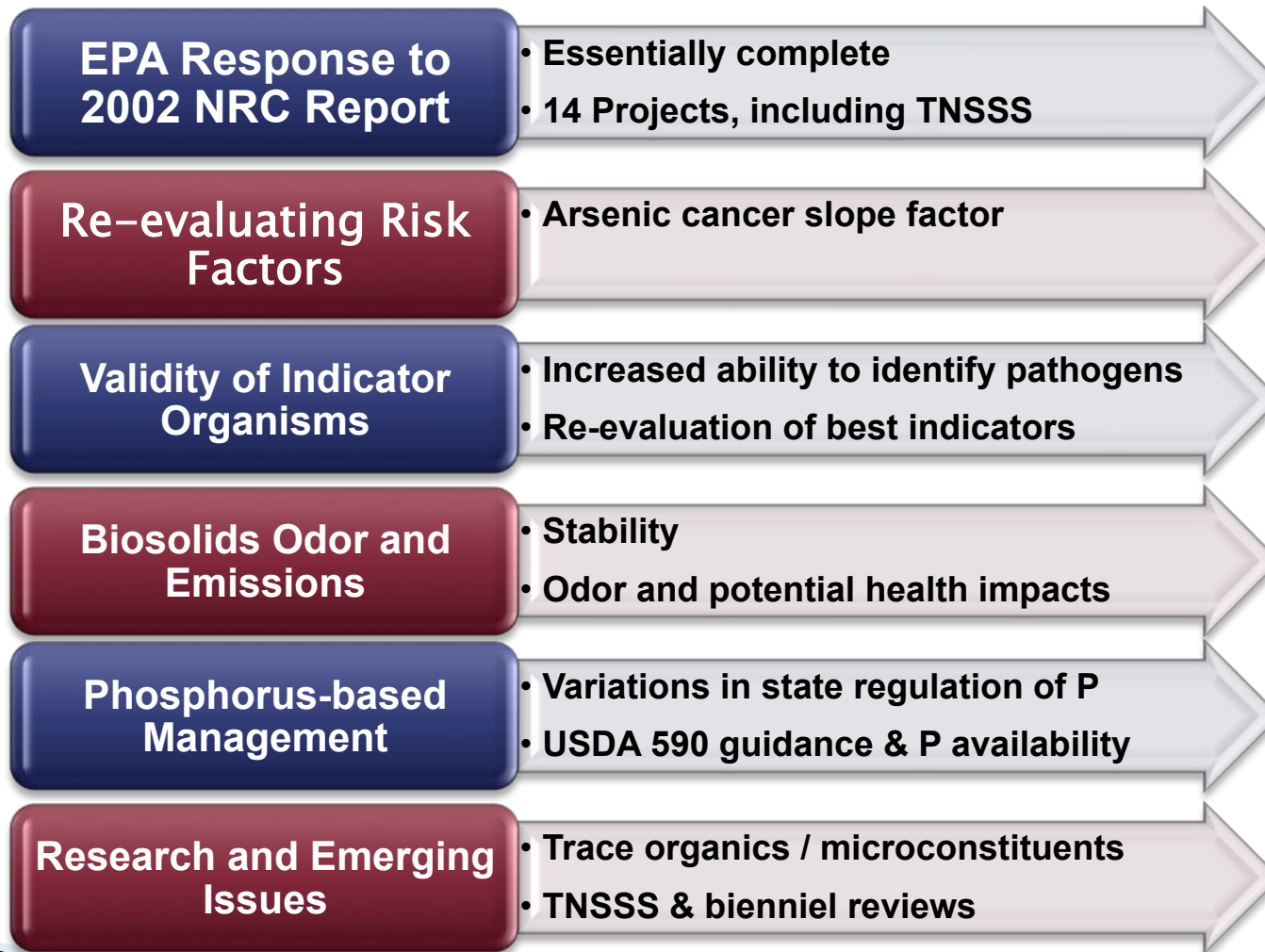
EPA Response to 2002 NRC Report

- In December 2003, the EPA responded to the 2002 NRC report with an action plan of 14 items, which have generally been completed, including:
 - the 2004 state-of-the-science conference, Univ. of Florida
 - further improvement of biosolids risk assessment
 - ensuring advancements in quantitative microbial risk assessment
 - the Targeted National Sewage Sludge Survey, which included microconstituents / pharmaceuticals & personal care products
 - development of an investigation tool for reported human health impacts associated with land application of biosolids & manures; this was a project completed by the Water Environment Research Foundation
 - Ongoing biennial reviews
- EPA has not increased resources to the biosolids program; instead, it has reduced staff time and placed greater reliance on state programs.



20 Years of Part 503

Current efforts & looking ahead...

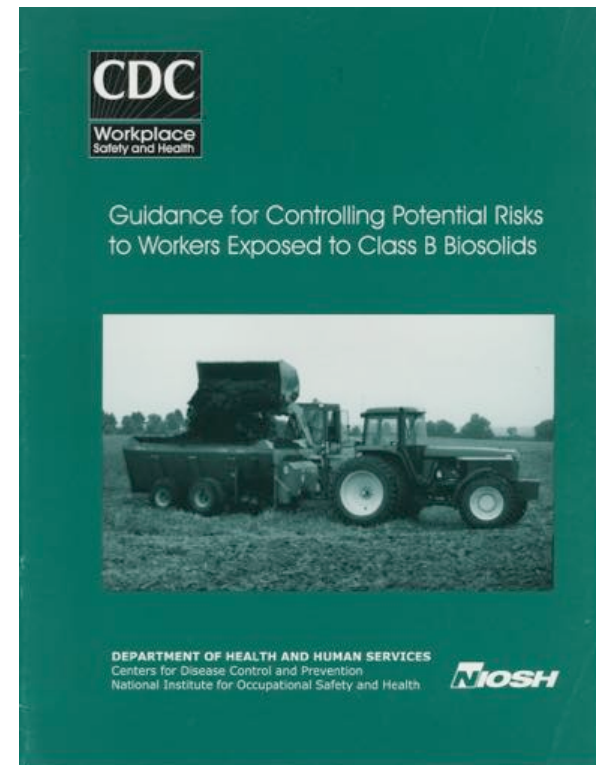




Other Applicable Federal Regulations, Guidance, & Policies

- **Food & Drug Administration**
Guide to Minimize Microbial Food Hazards for Fresh Fruits and Vegetables (1998)

NEW! Proposed regulations for food safety, which discuss biosolids, are proposed (Jan. 2013)
- **CDC / National Institute for Occupational Health & Safety (NIOSH)**
Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids (2002)



Other Applicable Federal Regulations, Guidance, & Policies

U. S. Dept. of Agriculture: Land Application

- **Long involved in research on biosolids, including through interagency agreements with EPA**

- **National organic program – biosolids not allowed**

“205.105 Allowed and prohibited substances, methods, and ingredients in organic production and handling.

To be sold or labeled as “100 percent organic,” “organic,” or “made with organic (specified ingredients or food group(s)),” the product must be produced and handled without the use of:

(g) Sewage sludge.”

“205.203 Soil fertility and crop nutrient management practice standard.....

(e) The producer must not use:...

(2) Sewage sludge (biosolids) as defined in 40 CFR part 503....”

- **NRCS nutrient management – *NEW* guidance**

590 Nutrient Management Conservation Practice Standard (December 2011)

Provides standards for land applying manures, biosolids, & other organic residuals.



Other Applicable Federal Regulations, Guidance, & Policies

EPA – Office of Air & Radiation:

***NEW* Sewage Sludge Incinerator (SSI) Rule**

2005 - Other Solid Waste Incineration (OSWI) rule

- EPA decision not to regulate SSI units under CAA §129, but rather §112
- EPA was sued (NDRC v EPA; 489F. 3d 1257-8)
- 2007 - courts determine that any unit burning solid waste must be regulated by Section 129 of Clean Air Act (CAA)

2010 - Resource Conservation and Recovery Act (RCRA) rule

- Defined sewage sludge as non-hazardous solid waste when it is combusted
- Sewage sludge failed to meet rule's "legitimate fuel criterion"
"Presence of non-comparable levels of metals when compared to traditional fuels"

March 31, 2011– Published final rule:

40 CFR Part 60 Subpart LLLL & MMMM - Standards of Performance for New Stationary Sources (LLLL) and Emission Guidelines for Existing Sources (MMMM): Sewage Sludge Incineration Units

**Current litigation brought by NACWA and Sierra Club.
Decision expected summer 2013.**



Other Applicable Federal Regulations, Guidance, & Policies *NEW* Sewage Sludge Incinerator (SSI) Rule

40 CFR Part 60 Subpart LLLL & MMMM

- Regulates *only* units that incinerate sewage sludge *at* WWTPs
 - Creates two subcategories
 - Multiple hearth
 - Fluidized bed
 - Establishes opacity limits and emissions limits for nine pollutants (based on maximum achievable control technologies [MACT])
 - Mercury
 - Lead
 - Cadmium
 - Hydrogen chloride
 - Particular matter
 - Carbon monoxide
 - Dioxins/furans
 - Nitrogen oxides
 - Sulfur dioxide



Other Applicable Federal Regulations, Guidance, & Policies
***NEW* Sewage Sludge Incinerator (SSI) Rule**

40 CFR Part 60 Subpart LLLL & MMMM

- Provisions for testing, monitoring, recordkeeping, reporting, and operator training
- Required to obtain title V operating permit
- SSI units will be subject to two sets of standards; Part 503 (CWA) and Subpart LLLL/MMMM (CAA)
 - Numeric standards, operational standards, monitoring, recordkeeping, and reporting
 - EPA plans to evaluate the requirements under both statutes to determine what changes, if any, should be made to part 503 regulations



Other Applicable Federal Regulations, Guidance, & Policies

EPA – Office of Air & Radiation:

Greenhouse Gas (GHG) Emissions

Reporting rule

Some large wastewater treatment plants are required to report GHGs. Others may be required to do so in the future.

Tailoring rule for PSD* & Title V

New facilities with GHG emissions of at least 100,000 tons per year (tpy) carbon dioxide equivalent (CO₂e) are required to obtain PSD permits. Existing facilities that emit 100,000 tpy of CO₂e and make changes increasing the GHG emissions by at least 75,000 tpy CO₂e, must also obtain PSD permits. Facilities that must obtain a PSD permit, to include other regulated pollutants, must also address GHG emission increases of 75,000 tpy or more of CO₂e. New and existing sources with GHG emissions above 100,000 tpy CO₂e must also obtain operating permits. ***Generally, wastewater treatment plants are not currently covered by this program.***

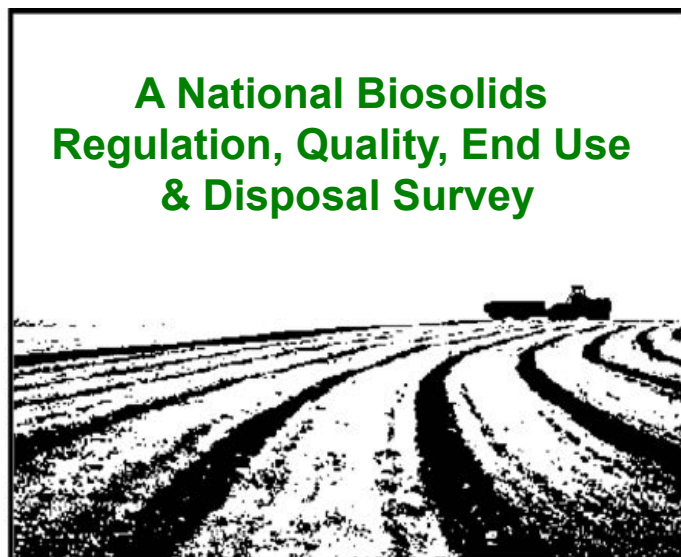
* Prevention of Significant Deterioration (of air quality), a long-standing Clean Air Act program



State Biosolids Regulations

The following slides provide information on state biosolids regulations derived from *A National Biosolids Regulation, Quality, End Use, and Disposal Survey* (NEBRA, 2007).*

Some of these data may be out of date; consult current regulations.



* <http://www.nebiosolids.org/uploads/pdf/NtlIBioslidsRpt-AppABC-07.pdf>

State Biosolids Regulations

Divisions of government that oversee biosolids management, disposal, and end use.

Environmental agency - water/wastewater program	58 %
Environmental agency - solid waste program	16 %
Environmental agency - water/wastewater program & Environmental agency - solid waste program	16 %
Environmental agency - water/wastewater program, Environmental agency - solid waste program & Public health department	2 %
Environmental agency - water/wastewater program, Environmental agency - solid waste program & Air quality	2 %
Environmental agency - water/wastewater program & Air division	2 %
Environmental agency - water/wastewater program, Environmental agency - solid waste program, Public health department or agency & Environmental agency - air program	2 %

NOTE: Some of these data may be out of date; consult current regulations.

State Biosolids Regulations

Mechanisms utilized for biosolids regulation by the state agency

General NPDES type permit	8 %
Specific NPDES type permit	30 %
Solid waste license/permit	18 %
General & Specific NPDES type permits	4 %
General & Specific NPDES type permits & Solid waste license/permit	4 %
Other	14%
No State Mechanism	6 %

NOTE: Some of these data may be out of date; consult current regulations.

State Biosolids Regulations

Requires any of the following oversight, certification, odor control, or pathogen control for biosolids land application programs.

Independent inspectors or monitors at land application sites	10 %
Certification of biosolids land appliciers who manage or implement land application programs	18 %
Numerical odor emission limits at land application sites	0 %
Other requirements or actions to control odors at land application sites	38 %
Sampling and testing of Class A biosolids for the presence of pathogens if three weeks or more have elapsed since processing	26 %

NOTE: Some of these data may be out of date; consult current regulations.

State Biosolids Regulations

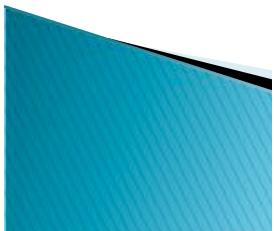
Number of FTEs per million population



NOTE: Some of these data may be out of date; consult current regulations.

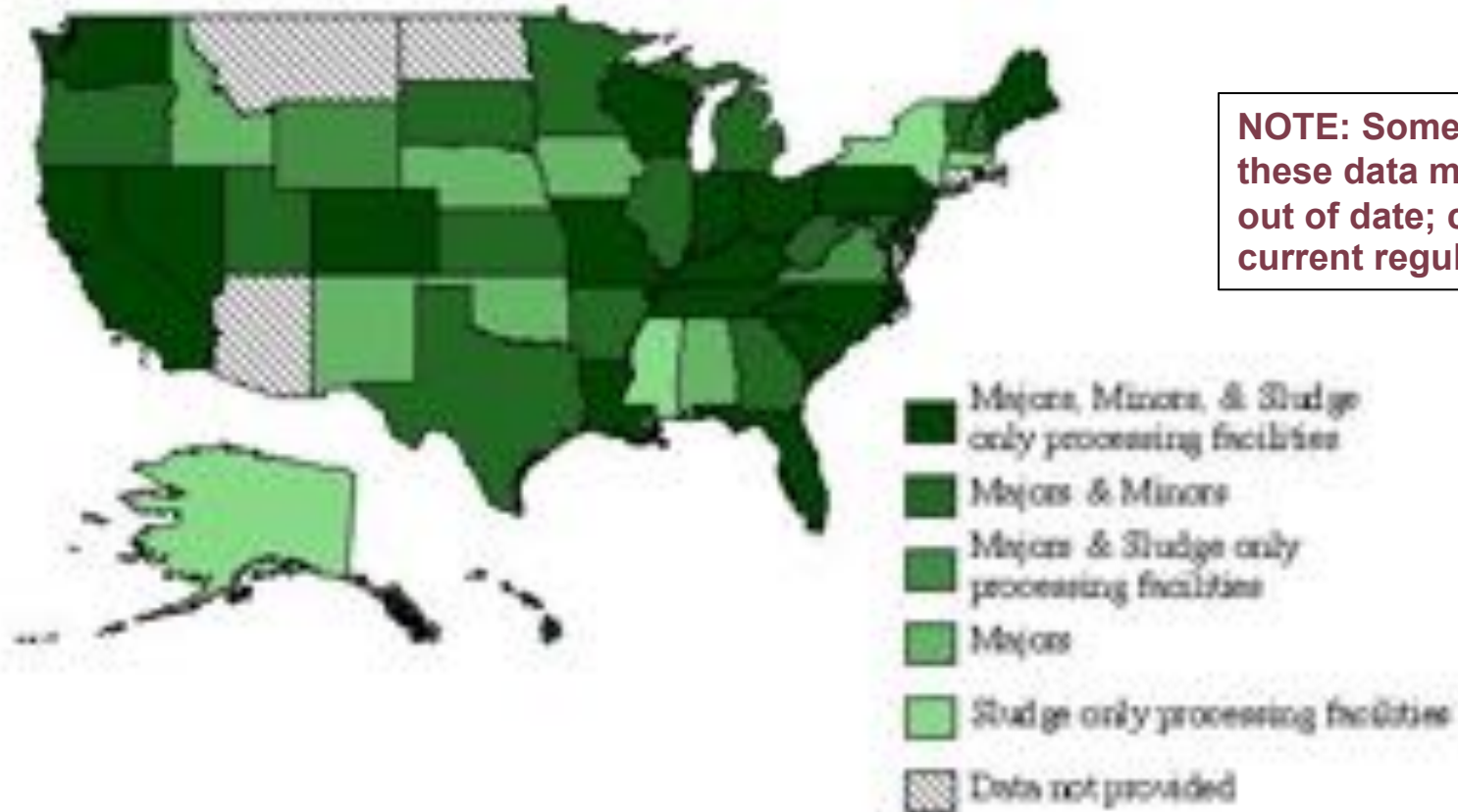
FTEs per million population

- 0.00 - 0.03
- 0.03 - 0.15
- 0.15 - 0.50
- 0.50 - 0.80
- 0.80 - 2.00
- 2.00 - 4.43
- Data not provided



State Biosolids Regulations

From whom does your state require reporting of biosolids information and data?



NOTE: Some of these data may be out of date; consult current regulations.



State Biosolids Regulations

Nutrient Management

Basis of Agronomic Loading Rate	Nitrogen	72 %
	Nitrogen & Phosphorus	14 %
	Nitrogen & Other	6 %
	Nitrogen , Phosphorus, & Other	4 %
	Formal Nutrient Management Plans	22 %
	Manages the application of P	50 %
	Additional Monitoring at Class B sites	56 %

NOTE: Some of these data may be out of date; consult current regulations.

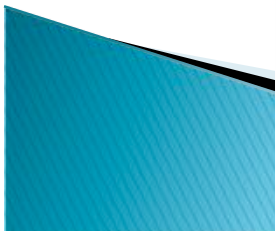
State Biosolids Regulations

As of today, are your state's biosolids regulations more restrictive than 40 CFR Part 503?



NOTE: Some of these data may be out of date; consult current regulations.

-  Management practices more restrictive than 40 CFR Part 503
-  Pollutant limits more restrictive than 40 CFR Part 503
-  Pathogen limits more restrictive than 40 CFR Part 503
-  Not more restrictive than 40 CFR Part 503



State Biosolids Regulations

Comparing state ceiling limits to Part 503 Table 1 (2006 data)

State	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn
Part 503										
Table 1	75	85		4300	840	57		420	100	7500
Hawaii	20	15	200	1500	300	10	15	100	25	2000
Indiana	75	85	N/A	4300	840	57	75	420	100	7500
Iowa			3000				75			
Kentucky	TCLP						75			
Maine	41	39	3000	1500	300	10	75	420	100	2800
Maryland		25		1000	1000	10		200		2500
New Hampshire	32	14	1000	1500	300	10	35	200	28	2500
New York	75	85	1000	4300	840	57	75	420	100	7500
Rhode Island	75	85	3000	4300	840	57	75	420	100	7500
Vermont	15	21	1,200	1,500	300	10	75	420	100	2,800
Washington	75	85		4300	840	57	75	420	100	7500
West Virginia	75	85	3000	4300	840	57	75	420	100	7500
Virginia										

NOTE: Some of these data may be out of date; consult current regulations.

State Biosolids Regulations

Comparing state “low metals” limits to Part 503 Table 3 (2006 data)

State	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn
EPA Table 3	41	39		1500	300	17		420	36	2800
Hawaii	20	15	200	1500	300	10	15	100	25	2000
Illinois										
Indiana	41	39		1500	300	17	75	420	100	2800
Iowa			1000				75		36	
Kentucky		10		450	250			50		900
Maine	10	10	1000	1000	300	6	75	200	100	2000
Maryland		12.5		500	500	5		100		1250
Massachusetts	41	14	1000	1000	300	10	10	200	36	2500
New Hampshire	10	10	160	1000	270	7	18	98	18	1780
New York	41	21	1000	1500	300	10	40	200	100	2500
Rhode Island	41	39	1200	840	300	17	75	420	36	2800
Vermont	15	21	1,200	1,500	300	10	75	420	100	2,800
Washington	41	39		1500	300	17	75	420	36	2800
West Virginia	20	39	1000	1500	250	10	18	200	36	2800

NOTE: Some of these data may be out of date; consult current regulations.

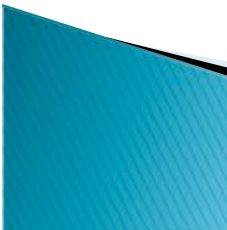
State Biosolids Regulations

Does your state allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year?



NOTE: Some of these data may be out of date; consult current regulations.

- Yes
- No
- Data not provided



State Biosolids Regulations

Does your state allow land applicators or landowners to become the holder of legal liability for biosolids end use?



NOTE: Some of these data may be out of date; consult current regulations.

State Biosolids Regulations

As of today, are local governments allowed to enact ordinances that are more restrictive than state law?



NOTE: Some of these data may be out of date; consult current regulations.

State Biosolids Regulations

County and local restrictions

- ▶ Local regulation of biosolids use on land proliferated in the 1990s and early 2000s in several states where public upset occurred: especially in CA, NH, PA, and VA.
- ▶ Local regulatory action has diminished in recent years, and some local ordinances banning or severely restricting biosolids use have been overturned by courts or rewritten to be more reasonable.
- ▶ But even areas where Class B biosolids land application has a long, successful history have occasional local reactions, such as the 2012 ordinance in Wahkiakum County, WA.
- ▶ Some legal challenges continue.

Biosolids Land Application in California




State Biosolids Regulations

Other State Regulations

- ▶ Additional state regulatory programs are affecting biosolids management with increasing frequency:
 - In California, regulations on VOC emissions are being applied to composting operations, and research had to be done to show biosolids composting emits relatively few precursors of smog formation.
 - In several states, air emissions regulations applied to biogas electrical generation facilities are complicating this kind of renewable energy project.
 - In Massachusetts and several other states, the regulatory structures allowing for co-digestion of biosolids and other organic wastes are still being developed; this is slowing creation of such beneficial projects.

These additional regulatory burdens make resource recovery from biosolids more complex and costly. In some cases, they create disincentives, driving biosolids to landfill disposal or other less environmentally sound management options.



State Biosolids Regulations

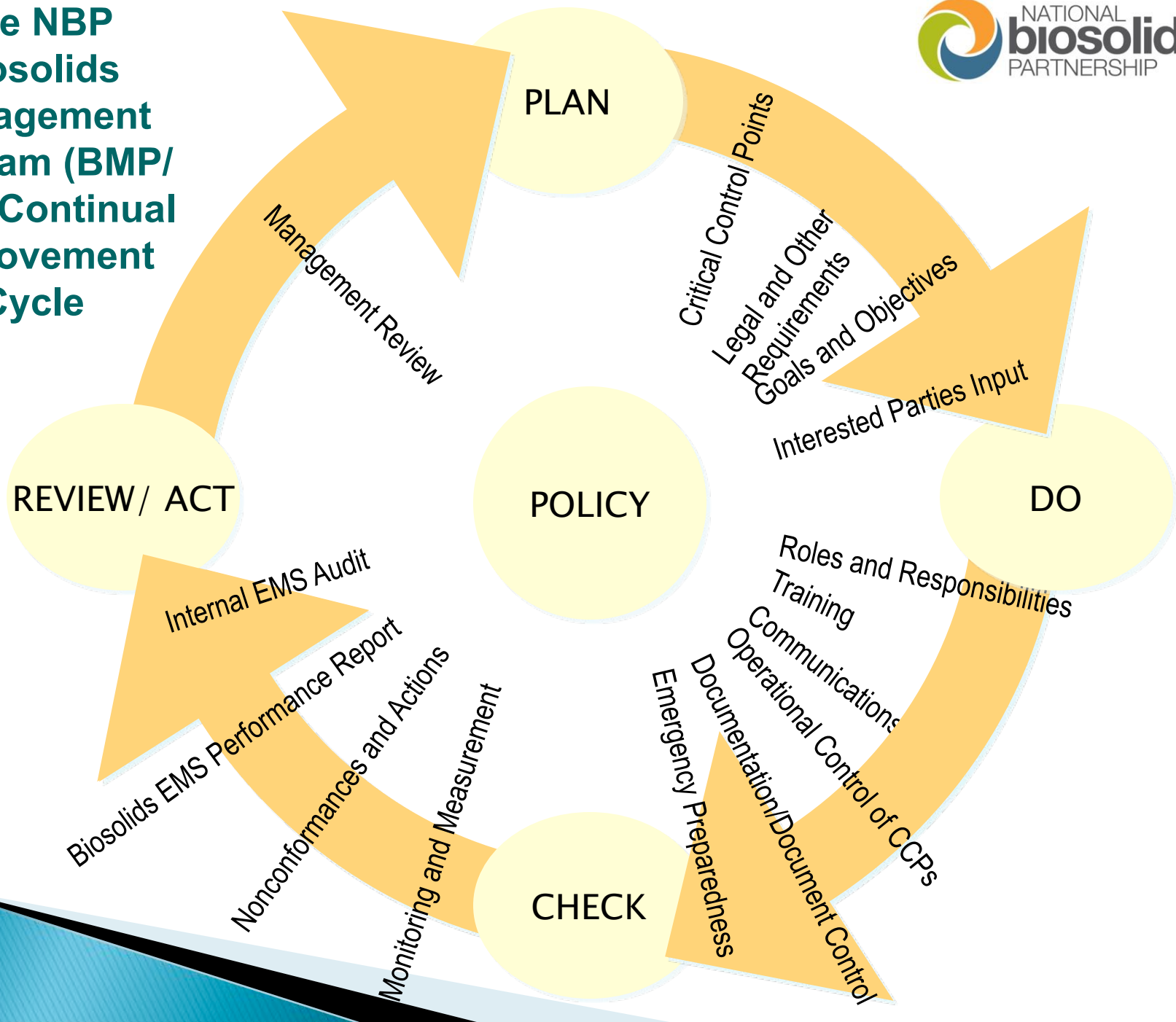
State Programs to Reward Environmental Stewardship

How can states encourage best biosolids management and going above & beyond regulations?

- ▶ 3 states currently reward forms of environmental stewardship, such as Environmental Management Systems (EMS), by providing incentives to organizations that adopt such voluntary programs that go above and beyond regulation.
- ▶ The NBP Biosolids Management Program (BMP, *aka* EMS) program qualifies for these benefits in these 3 states.



The NBP Biosolids Management Program (BMP/ EMS) Continual Improvement Cycle



State Biosolids Regulations
State Programs to Reward Environmental Stewardship
Wisconsin

- ▶ **The “Green Tier” Program under the DNR Bureau of Cooperative Environmental Assistance**
- ▶ **2 tiers + charter level**
- ▶ **Participants who have committed to an EMS receive:**
 - **Green Tier logo**
 - **Dept. of Natural Resources (DNR) single point of contact**
 - **Limited civil immunity**
 - **Publicity**
 - **Reduced inspection frequency**



State Biosolids Regulations
State Programs to Reward Environmental Stewardship
Wisconsin (2)

▶ **The WI Environmental Cooperation Pilot Program**

- Approved by EPA under a joint agreement to promote regulatory innovation through regulatory flexibility;
- Companies contract with DNR to allow variances in policies, guidance and rules in exchange for superior environmental performance available as a result of this process

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State Biosolids Regulations

State Programs to Reward Environmental Stewardship

Indiana

▶ **Two offerings:**

▶ **Environmental Stewardship Program**

- The ESP is a voluntary, performance based leadership program designed to recognize and reward Indiana regulated entities for going above and beyond current environmental regulations;
- Implementing an EMS qualifies the business for regulatory flexibility including expedited and flexible permits, reduced reporting frequencies, reduced record keeping and reporting, low priority for routine inspections, public recognition and networking opportunities;



State Biosolids Regulations

State Programs to Reward Environmental Stewardship

Indiana (2)

- **Partners for Pollution Prevention**

- The Indiana Partners for Pollution Prevention (Partners) is a group of businesses and other organizations that volunteer for a public-private partnership with IDEM to promote pollution prevention and environmental stewardship in Indiana
- For the PPP, participants receive public recognition and networking opportunities.

- **CONTACT:**

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State Biosolids Regulations

State Programs to Reward Environmental Stewardship

Virginia

- **The Virginia Environmental Excellence Program (VEEP)**

The Virginia Environmental Excellence Program was established to encourage superior environmental performance through the development and implementation of environmental management systems and pollution prevention efforts. VEEP drives environmental excellence by encouraging facilities within the Commonwealth that have strong environmental records to go above and beyond their legal requirements.

- VEEP members earn recognition and are potentially eligible to utilize specific regulatory and administrative flexibilities.

- Facilities are recognized at one of three levels:

- E2 – environmental enterprise;
- E3 – exemplary environmental enterprise;
- E4 – extraordinary environmental enterprise

All 3 levels require and recognize the EMS for qualification



State Biosolids Regulations State Programs to Reward Environmental Stewardship Virginia (2)

- **Specific Benefits of VEEP Participation:**
 - Public recognition;
 - Reductions in permit fees up to 10%;
 - Access to the “alternate compliance methods” process with regard to state regulations.

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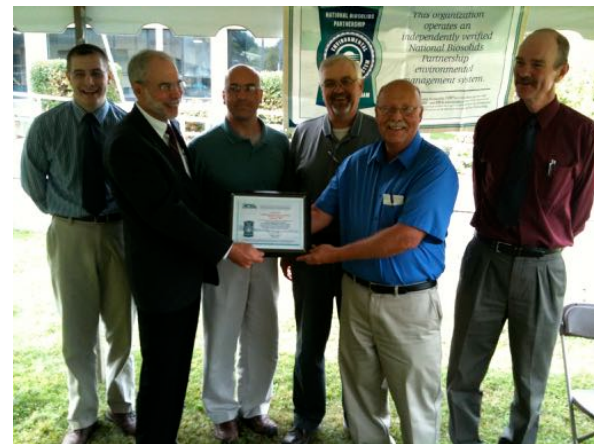


State Biosolids Regulations

State Programs to Reward Environmental Stewardship

Summary

- Environmental management systems (EMS) are a recognized required component of each of these 3 examples
- Regulatory relief can happen for programs that implement the NBP BMP/EMS program
- States can develop specific customized programs or collaborate with EPA in some cases
- These programs can lead to higher levels of voluntary pollution control and reduction



Part 1: Federal & State Regulations

Conclusions

- **EPA considers the Part 503 Rule to be mature & stable:**
 - the highest-risk concerns have been addressed (heavy metals, many chemicals of concern, pathogens, radioactivity, nutrients, stability, odors, etc.)
 - EPA continues to reduce involvement – fewer staff, end of funding for state regulator workshop and National Biosolids Partnership
 - EPA continues some monitoring & evaluation of emerging concerns
- **State biosolids regulatory programs have been advancing and many are also mature and stable, while others continue to develop.**
- **Many states now take the lead in regulating biosolids.**
- **State regulatory programs need support & ongoing training re emerging issues.**



Part 1: Federal & State Regulations

Conclusions: There are challenges!

- **First, the regulatory and policy landscape is complex and is likely to become more so over time** – a challenge for putting to use the resources in biosolids

- **Second, public perception will continue to be a key driver of both regulation and policy:**
 - Many regulatory agencies are not providing much education about biosolids management.
 - There are continuing intermittent and generally local challenges to land application, incineration, and other biosolids management activities.
 - Biosolids managers are left with responsibility for providing outreach & education about biosolids.



Part 1: Federal & State Regulations

Conclusions: The odor challenge

- **Public perception** of biosolids management will continue to be closely associated with odors from processing, handling, and end use/disposal.
- **Odor concerns** drive state and local regulatory activities, including odor management plans and, in some locales, “zero tolerance” approaches to biosolids odors.
- **In addressing this issue**, biosolids managers note that compliance with Part 503 does not necessarily mean that product odor will be acceptable and suggested that modifications to current stabilization criteria might be warranted.
 - Any modifications would need to consider product use, as product quality requirements will vary for different uses.
- Compost is an example where modified criteria would be beneficial:
 - carbon dioxide respiration and product curing requirements are potential methods to better ensure that a compost product is well stabilized.




Part 1: Federal & State Regulations

Conclusions: What's at stake

Failure to proactively address current biosolids concerns (odors, emerging pathogens, microconstituents, overall public perception, management of phosphorus) could substantially negatively impact biosolids management in the future.

This could lead to:

- ▶ A more fragmented, state-by-state regulatory framework that increasingly drifts from the Federal 503 baseline
 - ▶ The introduction of more restrictive management practices such as fence line setbacks and incorporation requirements; increased legal liability
 - ▶ Greater uncertainty around the mid-term viability of technology and programmatic choices
 - ▶ Substantially greater complexity associated with obtaining and maintaining management options
 - ▶ A substantial increase in management costs that results in more biosolids sent to landfills without resource recovery.
- 

Part 1: Federal & State Regulations

Conclusions: How biosolids managers can help

Communication – and coordination – will become increasingly important – with EPA departments and other departments and agencies at the state level that have not historically been involved in biosolids management.

- For example, EPA Office of Air & Radiation was relatively unfamiliar with unique issues associated with wastewater solids incineration in the U.S. when it developed the new 2011 SSI regulations.
- Understandably, similar issues can arise at the state level.
- Cross media issues will continue to complicate the biosolids regulatory landscape.



Part 1: Federal & State Regulations

Conclusions: How biosolids managers can help

As the biosolids sector increasingly deals with cross-media regulatory impacts, it will be critical to **emphasize the concept of “maximum environmental benefit”** in regulatory development.

Biosolids managers should **encourage development of a multi-agency regulatory coordination strategy**, including a comparative risk, cross-media approach to regulatory development.

Biosolids managers and other experienced professionals will need to **provide guidance to regulators** as new products emerge from wastewater and biosolids processing, and questions arise as to how (or if) those products should be regulated.



Resources

EPA Biosolids Program / Part 503

Part 503 regulations & EPA regulatory activities

(Office of Water – Science & Technology)

<http://water.epa.gov/scitech/wastetech/biosolids>

Part 503 & EPA biosolids program guidance

(Office of Water – Wastewater Program)

<http://water.epa.gov/polwaste/wastewater/treatment/biosolids/>

NAS / National Research Council Reviews of Part 503

[1996: Use of Reclaimed Water and Sludge in Food Crop Production](#)

[2002: Biosolids Applied to Land: Advancing Standards and Practices](#)

EPA Response to NRC 2002 Review

<http://water.epa.gov/scitech/wastetech/biosolids/dec03factsheet.cfm>



Resources

Other U. S. Government Regulations, Guidance, & Policy

U. S. Food & Drug Agency

Guidance for Industry: Guide to Minimize Microbial Food Hazards for Fresh Fruits and Vegetables (1998)

<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm064574.htm>

CDC – National Institute for Occupational Safety and Health (NIOSH)

Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids (2002)

<http://www.cdc.gov/niosh/docs/2002-149/>

U.S. Dept. of Agriculture: National Organic Program

National Organic Program website

<http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateA&navID=NationalOrganicProgram&page=NOPNationalOrganicProgramHome&resultType=&topNav=&leftNav=NationalOrganicProgram&acct=nop>

7 CFR Part 205 – National Organic Program Regulations

<http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=89420dada951a542e98f097da8b8a214&rqn=div5&view=text&node=7:3.1.1.9.32&idno=7>



Resources

Greenhouse Gas (GHG) Emissions Regulations & Estimation Tools

U. S. EPA Office of Air & Radiation

Greenhouse Gas (GHG) Emissions Reporting Program

<http://www.epa.gov/ghgreporting/index.html>

Greenhouse Gas (GHG) Prevention of Significant Deterioration (PSD) & Title V Tailoring Rule

On the following website, see under “2010” and more recent actions:

<http://www.epa.gov/nsr/actions.html>

Greenhouse gas (GHG) emissions & biosolids management

The Biosolids Emissions Assessment Model (BEAM) developed by Sylvis Environmental and partners from the Canadian Council of Ministers of the Environment (CCME) is a tool for estimating emission from various biosolids management treatment and management options.

http://www.ccme.ca/ourwork/waste.html?category_id=137

See also Env. Sci. & Tech. paper: <http://pubs.acs.org/doi/abs/10.1021/es101210k>

NEBRA: GHG Emissions and Biosolids Management page:

<http://www.nebiosolids.org/index.php?page=biosolids-management-greenhouse-gas-emissions>

The current standard for municipalities to calculate GHG emissions, including from wastewater treatment & solids management, is at The Climate Registry:

<http://www.theclimateregistry.org/resources/protocols/local-government-operations-protocol/>



Resources

Biosolids Use & Trends

A National Biosolids Regulation, Quality, End Use, & Disposal Survey

A collaborative report by NEBRA, NBMA, *BioCycle*, and WI Dept. of Natural Resources

Report (with Executive Summary):

<http://www.nebiosolids.org/uploads/pdf/NtlBiosolidsReport-20July07.pdf>

State-by-state details (regulations and use & disposal data):

Alabama – Missouri

<http://www.nebiosolids.org/uploads/pdf/NtlBioslidsRpt-AppD-AL-MO.pdf>

Montana - Wyoming

<http://www.nebiosolids.org/uploads/pdf/NtlBioslidsRpt-AppD-MT-WY.pdf>



Resources

Federal & State biosolids contacts & regulations

State and Regional Biosolids Contacts:

<http://www.wef.org/Biosolids/page3.aspx?id=7555>

EPA Headquarters and ORD Biosolids Contacts:

<http://www.wef.org/Biosolids/page.aspx?id=7808>

Biosolids State Regulations:

<http://www.wef.org/Biosolids/page.aspx?id=7542>

Technical Resources:

<http://www.wef.org/Biosolids/page.aspx?id=7522>

Regional Biosolids Associations

<http://www.wef.org/Biosolids/page.aspx?id=7691>



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King County, Washington

Mid-Atlantic Biosolids Association (MABA)

North East Biosolids and Residuals Association (NEBRA)

Northwest Biosolids Management Association (NBMA)

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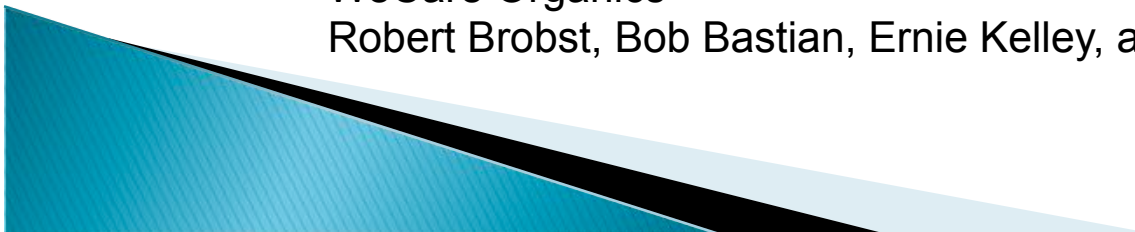
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Philadelphia Water Department

Water Environment Federation

WeCare Organics

Robert Brobst, Bob Bastian, Ernie Kelley, and Greg Kester (reviews)





Recognizing A Resource:

biosolids

**A Roadmap for State & Regional Biosolids
Coordinators
and other interested parties**

This has been Part 1; see also:

Part 2: 40+ Years of Research & Experience

**Part 3: Current Trends & Drivers in Biosolids Management &
Focusing on *Resource Recovery***

Available at:

<http://www.wef.org/Biosolids/page.aspx?id=7522>