



Cooperatively promoting the environmentally sound recycling of biosolids and other residuals

Information Update: US EPA Defines “Sewage Sludge” as Solid Waste **July 20, 2009; updated August 25, 2009 and May 10, 2010**

Summary

On April 30th, U. S. EPA released a proposed set of rules addressing “the regulation of commercial and industrial incinerators and boilers under the Clean Air Act (CAA)” (NACWA, 2010). The proposed rules impact the management of sewage sludge, amongst other materials, by clarifying what is defined as solid waste and what is not. EPA is not proposing to change the definition of solid waste; rather the Agency is “proposing that sewage sludge, generated from POTWs and when combusted, be classified as a solid waste, and subject to the CAA Section 129 requirements.” The proposed rule will be published in the *Federal Register* in May, and a 45-day public comment period will follow.

Key Concerns

- *Sewage Sludge Incinerators (SSI) will have to comply with stricter Clean Air Act (CAA) Section 129 MACT standards.* This is this rulemaking’s major, clear, and intended impact on sewage sludge management. Sewage sludge incinerators will be significantly affected.
- *Will current and future systems that are designed to put sewage sludge to use as an alternative fuel come under this rule and have to comply with the stricter CAA Section 129 standards?* This could be a concern for biogas utilization programs (is biogas a solid waste under this rule?), co-generation, and gasification or pyrolysis projects.
- *EPA requests comments regarding sewage sludge being regulated under multiple programs: air and water.* As EPA clearly recognizes in the proposed rule, this action does not create a solid waste exclusion for combusted sewage sludge. Rather, EPA recognizes that combusted sewage sludge is to be regulated under both the Clean Air Act (Section 129) and the Clean Water Act (Part 503). However, in the draft final rule, EPA asks for comment on whether EPA has the discretion to possibly avoid this redundancy in regulation.
- *Of minor potential concern:*
 - While EPA clearly states that it believes the rule will not impact state regulatory programs for sewage sludge management, there is a small chance that unintended impacts might occur that would require states to amend laws or regulations, especially if they happen to reference federal definitions of solid waste and/or the Domestic Sewage Exclusion.
 - In the draft final rule, the data used to describe sewage sludge is grossly outdated (1988 and prior) and not representative of modern-day sewage sludges/biosolids. This, and some of the language used in the EPA discussion, mischaracterizes the quality and value of sewage sludge/biosolids.

Background

On January 2, 2009, U. S. EPA published an advance notice of proposed rulemaking in the *Federal Register*, seeking comments on a proposed regulation to clarify the definition of “solid waste” as it refers to non-hazardous materials, including sewage sludge or biosolids.

U. S. EPA's Office of Resource Conservation and Recovery (ORCR, formerly Office of Solid Waste) proposed this new, refined definition of solid waste partially in response to a court decision that required EPA action by September 15, 2009 – a deadline that was later extended to April 2010. The core issue was whether or not sewage sludge combustion will be regulated under Section 112 of the Clean Air Act (CAA) or Section 129.

In 2009, EPA stated the purpose of this regulatory action in this way, “EPA now needs to articulate which nonhazardous secondary materials constitute solid wastes under RCRA Subtitle D so that EPA can establish appropriate standards under CAA sections 112 and 129 for units that combust secondary materials for the purposes of energy recovery or when used as an ingredient” (*Federal Register*, 2009).

Is “Sewage Sludge” Excluded From the RCRA Definition of “Solid Waste?”

One reason that sewage sludge has not been regulated under CAA Section 129 in the past seems to be because EPA has not in the past formally defined it as a solid waste under the Resource Conservation and Recovery Act (RCRA).

In February 2, 2009 comments, the National Association of Clean Water Agencies (NACWA) argued that the RCRA definition of “solid waste” does not and should not include sewage sludge, because the definition specifically states that it “does not include solid or dissolved material in domestic sewage....” NACWA wrote: “Both Congress and EPA have stated that the Domestic Sewage Exclusion includes the sewage sludge processed at POTWs. After all, sewage sludges are simply the ‘solid and dissolved materials in domestic sewage’ that are filtered and extracted during the wastewater treatment process.”

In its April 2010 proposed rule, EPA stated: “We agree with commenters that the RCRA definition of solid waste excludes the solid and dissolved materials in domestic sewage. This is evidenced by the RCRA hazardous waste regulations that extend this exclusion to mixtures of hazardous waste with domestic sewage, provided that the mixture occurs in a pipeline en route to a POTW.... However, we do not agree with the commenters that the Domestic Sewage Exemption applies to the sludge generated from the treatment process and thus, sewage sludge is a solid waste if it is discarded¹. We believe that sewage sludge burned without energy recovery (i.e. burned for destruction) in an incinerator is discarded, and thus a solid waste. Further, the Agency is not proposing to provide a regulatory solid waste exclusion for sewage sludge burned in incinerators that would preserve the current framework for regulating sewage sludge managed under section 405 of the CWA [Clean Water Act] to avoid redundancy. However, we request comment on whether such an approach is within our discretion.”

Clarifying that the Domestic Sewage Exclusion does not include combusted sewage sludge allows EPA's air office to apply the existing regulations for combustion of non-hazardous solid wastes to sewage sludge incineration. Those regulations determine whether various “secondary” materials – such as sewage sludge – are “legitimate” resources (fuels) being recycled as valuable commodities or are merely being “discarded.”

¹ “EPA has long viewed sewage sludge generated from POTWs as a solid waste, beginning with the 1980 Identification and Listing of Hazardous Waste rulemaking. In this final rule, EPA stated that the DSE [Domestic Sewage Exemption] is ‘only applicable to non-domestic wastes that mix with sanitary waste in a sewer system leading to a POTW.’ See 45 FR 33097 (May 19, 1980). In the same rule, EPA further said it decided not to exclude sewage sludge from regulation under RCRA, since the statutory expressions regarding the definitions of ‘solid waste’ and ‘sludge’ was clear. (See 45 FR 33101).”

Determining Whether Combusted Sewage Sludge is a Legitimate Alternative Fuel or Ingredient

For solid wastes used as alternative fuels or ingredients to be considered “legitimate” – and thus *excluded* from the definition of solid waste – they must meet three criteria:

1. They must be handled as a *valuable commodity*.
2. They must have meaningful *heating value* or provide a useful contribution to a final product.
3. Any contaminants in the material must not present significant risk when they are released during combustion (based on a qualitative evaluation), or contaminants must not be present in significantly higher concentration in the final product (the fuel) than in a traditional product (fuel, *e.g.* coal).

Applying these criteria to sewage sludge:

1. *Valuable commodity*: EPA’s thinking is that sewage sludge incinerators have been intended to dispose of (“discard”) sewage sludge; i.e. sewage sludge is not a “valuable commodity.” Even if energy is recovered from combustion of that sewage sludge, the material would still be considered a solid waste, because, in most cases, the main purpose of the combustion process is for disposal, not energy production. Generally, unless the energy recovery system is integral in the design of the combustion operation, the sewage sludge is considered to be “discarded” and, therefore, not a legitimate fuel.
2. *Heating value*: Sewage sludge does have meaningful heating value; when dry, it is similar to low-grade coal. In the proposed rule discussion, EPA does not challenge this fact.
3. *Contaminants*: In the proposed rule discussion, EPA perfunctorily notes that typical concentrations of metals in sewage sludges are higher than in coal, stating “the Agency does not believe that sewage sludge would meet the legitimacy criteria for contaminants.” However, this assessment appears to be based on data included in the discussion that is 25 years old and is not representative of modern municipal sewage sludges and biosolids.

Thus, the challenge for sewage sludge incinerators might be demonstrating that sewage sludge meets all three criteria as a legitimate alternative fuel, and that it is not something that is just being “discarded.” For older incinerators, this would be hard to do, because any energy recovery system is added on, not integral to the system. However, facilities that utilize sewage sludge as a fuel (or one of several fuels), in which the intention of the facility is energy production, should be able to consider the combusted sewage sludge as a legitimate fuel under the first criteria. And there are biosolids products being produced today that meet the first and second criteria, such as heat-dried pellets used for fuel in cement kilns or other energy-producing facilities. However, EPA cites sewage sludge quality (with regards to metals concentrations) as a reason why the third criteria is not met. The Agency then proposes a categorical requirement that applies to all “sewage sludge, generated from POTWs and when combusted...” Those sewage sludges are to “be classified as a solid waste, and subject to the CAA Section 129 requirements.” However, one section of the proposed rule states that the producer of any of the non-hazardous secondary materials discussed in the rule can petition EPA that its material is a legitimate fuel, demonstrating how it meets the legitimate fuel criteria.

The Impact of Clean Air Act Section 129 vs. Section 112

The ORCR’s refined RCRA definition of incinerated sewage sludge as a solid waste results in the EPA Office of Air and Radiation requiring sewage sludge incinerators to comply with the standards of the CAA Section 129, which applies to all combusted materials defined as solid wastes. These standards are stricter and will apply maximum achievable control technology (MACT) standards to each individual sewage sludge incinerator.

According to the January 2, 2009 *Federal Register* notice, Sections 112 and 129 “differ in three primary respects:”

First, CAA section 112 requires that MACT standards be established for major sources of HAP (hazardous air pollutant) emissions, but provides discretionary authority to establish MACT standards for area sources of HAP emissions. On the other hand, the CAA section 129 MACT standards apply across the board to all solid waste incineration units in a given category regardless of size. Second, CAA section 129 requires that emission standards be set for specific HAP and certain pollutants that are not classified as CAA section 112 HAP. Specifically, CAA section 129 requires numeric emission limitations for the following nine pollutants: cadmium, carbon monoxide dioxins/furans, hydrogen chloride, lead, mercury, NOX, particulate matter (total and fine), opacity (as appropriate), and SO₂. The CAA section 129 pollutants listed above represent the minimum that must be regulated; EPA has the discretion to establish standards for other pollutants as well. Third, CAA section 129 includes requirements for operator training, pre-construction site assessments, and monitoring that are not included in CAA section 112.

For many sewage sludge incinerators, it will be a costly challenge to meet the stricter Section 129 air emissions standards. This would be especially true for multiple hearth incinerators (MHIs), *if* the MACT standards were set based on the pool of all sewage sludge incinerators; in that case, the standards would be significantly influenced by inclusion of more modern, cleaner-burning fluidized bed incinerators (FBIs).

The EPA Office of Air is expected to publish a draft rule on this by summer 2010; that action is driven by a court-ordered deadline requiring final Section 129 MACT standards by December 2010. In order to establish numerical MACT standards, over the past year, the Agency required nine SSIs around the country to measure emissions and submit data. The group included five MHIs and four FBIs. Apparently, EPA is using this data to create two separate sets of MACT standards, one for MHIs and one for FBIs that burn sewage sludge. Because MACT standards are set based on the performance of the top 12% of operating facilities (those with lowest emissions), the standards are expected to be stringent. For Connecticut and Rhode Island and other areas that rely on incineration for sewage sludge management, the costs for compliance would likely be high.

Will Other Forms of Biosolids Management Be Affected?

As this regulation developed, there was some question as to whether clarifying that at least some sewage sludge falls under the definition of solid waste would lead to unintended impacts on sewage sludges managed in ways other than incineration.

In its April 2010 proposed rule, EPA re-stated this: “[T]hrough this rulemaking, EPA is articulating the narrow definition of which non-hazardous secondary materials are or are not solid waste when used as fuel for energy recovery or as ingredients in combustion units. We are not making solid waste determinations that cover other possible secondary material end uses. In EPA’s view, these regulations would have no effect on state programs that choose to regulate this material in different ways and under different authorities.”

But, even if EPA has no *intention* of impacting other biosolids management options, could there be

unforeseen impacts? For example, some states may link their management requirements for sewage sludge and biosolids to the federal definition of what is defined as a solid waste or to the Domestic Sewage Exclusion. If, because of this federal action, sewage sludge and biosolids are suddenly defined as a solid waste, then the biosolids management programs in those states – perhaps including land application programs – may suddenly be technically subject to a different laws and regulations. Of course, any state that already treats sewage sludge as a solid waste will probably not be impacted; in the North East, this is the case in Maine, New York, and Vermont. And, in reality, it is very unlikely that a state would significantly change its sewage sludge/biosolids management program just because of a nuanced change to how a federal definition is applied; instead, the state would adapt its reference language. An example of a state that regulates sewage sludge mostly under its clean water program is New Hampshire; there, the state already excludes sludge and septage in its definition of solid waste and delegates authority for how these materials are regulated.

Another possible concern arising from the proposed rule is whether anaerobic digester gas will be considered a legitimate alternative fuel and not a solid waste. Traditionally, anaerobic digesters were built to reduce the volume of sewage sludge; this could be seen as a method of discarding the material. Today, however, digester gas from anaerobic digestion is valued as a commodity, and systems are designed to contain it, handle it as a valuable commodity, and utilize it for energy. It is reasonable to argue that sewage sludge and digester gas in such systems should *not* be considered discarded and should not be defined as solid wastes.

Conclusion

EPA's current proposed rule could significantly impact the costs borne by sewage sludge incinerators to comply with Clean Air Act requirements. There remain some questions regarding the potential impacts on facilities designed to use sewage sludges as alternative fuels, including biogas utilization and gasification systems. Other impacts on sewage sludge and biosolids management, if any, are likely to be minimal.

Sources

- National Association of Clean Water Agencies (NACWA), 2009. "Comments...on U. S. EPA's Advanced Notice of Proposed Rulemaking, 74 Fed. Reg. 41 (January 2, 2009) Seeking Input on Defining 'Solid Waste' as it Applies to Non-Hazardous Materials," dated Feb. 2, 2009.
- NACWA, 2010. Letter from NACWA National Office, May 5, 2010.
- National Association of Clean Water Agencies, 2009, 2010, communications from C. Hornback.
- Federal Register*, 2009: 74 Fed. Reg. 41 (January 2, 2009), available at <http://edocket.access.gpo.gov/2009/pdf/E8-30987.pdf>
- U. S. Environmental Protection Agency (EPA), 2010. Identification of Non-Hazardous Secondary Materials That Are Solid Waste, Proposed Rule (pre-publication copy)
- Communications with state biosolids coordinators in Maine, New Hampshire, and Vermont.
- Communications with Jeff Fowley, Esq., Hazardous Waste Section, U. S. EPA Region 1.
- Communications with George Faison, U. S. EPA, Washington, DC.

About NEBRA

The North East Biosolids and Residuals Association is a 501(c)(3) non-profit professional association dedicated to advancing the recycling of biosolids and other organic residuals in New England and eastern Canada. NEBRA membership includes most of the environmental professionals and organizations that produce, treat, test, consult on, and manage the beneficial uses of biosolids and other large volume recyclable organic residuals in this region. NEBRA is funded by membership fees, donations, and project grants. It is directed by a volunteer Board of Directors of professionals from MA, ME, NB, NH, and VT. NEBRA's financial statements and other information are open for public inspection during normal business hours. Information requests and memberships are welcome from anyone: info@nebiosolids.org or 603-323-7654.