

Public comments: Amendment of Regulations pertaining to Biosolids after transfer from the Virginia Department of Health

The Federal Water Pollution Control Act (CWA) of 11/27/02 does not use the word “biosolids” and is explicit in its use of the phrase “sewage sludge,” especially in Section 405. VDH had no authority to substitute the word “biosolids” for sewage sludge. The etymology of the word biosolids derives from the waste disposal industry who coined it in an attempt to disguise the true nature of the material. The most “solid” material of biological origin is wood or bone, so the construction of the word is nonsense.

With regard to the CWA “The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Sec. 101 (a). The word “restore” is critical, and requires not just that EPA’s TMDL goals be met, but that the Chesapeake Bay ecosystem change so as to approach a state documented in the historical past. In order to achieve restoration, Section 405 (a) dictates “... in the case where the disposal of sewage sludgewould result in **any** pollutant from such sewage sludge entering the navigable waters, such disposal is prohibited” (my emphasis). Section 405 (d) further requires “...establishing numerical limitations for each such pollutant ...” Numerical limits have been established in DCR’s Virginia Nutrient Management Standards and Criteria, Revised 2005 (hereafter identified as “Standards”) and these “numerical limitations” must be imposed to adhere to Federal law.

In the case of phosphorus (P), according to Section V of “Standards,” in no case should more than 120 pounds of P be applied per acre. Since the annual agronomic crop-removal rate for P is rarely more than about 40 pounds per acre, permitting as much as 120 pounds of P to be disposed annually is very lenient and would have no negative impact on crop productivity. According to “Standards,” the allowable amount of P (as pounds of P₂O₅) disposed per acre is $120 - (2.18 * \text{ppm P})$ where “ppm P” is the Mehlich 1 soil test value. Disposal at P at higher rates, as is allowed by the Phosphorus Index, by the recently revised Poultry Regulations, and by these proposed regulations is a blatant violation of the Clean Water Act. P-based land application, using the “numerical limits” in “Standards,” is the only legal option for land application of any animal waste.

Any nutrient that is not sequestered in the harvested crop either accumulates in the soil or pollutes the environment by processes such as infiltration, runoff, volatilization, etc. There exist no other possibilities. The huge amounts of N and P disposed by the land application of animal waste are not all sequestered in the crop or retained in the soil, and therefore pollution is certain. There exists no science to support P disposal in excess of a realistic annual agronomic rate, as is provided in “Standards.” It is an undeniable scientific fact that any fertilizer applied at more than the annual agronomic rate increases pollution and “...any pollutant from such sewage sludge entering the navigable waters ... is prohibited.” The only reason for sanctioning higher P disposal rates than recommended in “Standards” is to protect the profits of special

interests, to the detriment of water quality, the same reason that VDH proposed to use “biosolids” and not “sewage sludge.”

The Code of Virginia (CoV) uses the phrase “sewage sludge” 55 times in §62.1-44.19:3 and states explicitly in §62.1-44.19:3.A.2 “The addition of lime or deodorants to sewage sludge that has been treated to meet land application standards shall not constitute alteration of the composition of sewage sludge.” Clearly it is the intent of the General Assembly to adhere to Federal policy and characterize the human solid waste derived from wastewater treatment facilities as “sewage sludge” and not “biosolids.” Neither the Virginia Department of Environment Quality nor the State Water Board have the authority to trump Federal statute or the intent of the General Assembly. The word “biosolids” must be removed everywhere from the Virginia Administrative Code, and on signage, and replaced by the legally binding phrase “sewage sludge.”

CoV §62.1-44.19:3.B dictates that “The Board shall adopt regulations to ensure that ... (ii) land application, marketing, and distribution of sewage sludge is performed in a manner that will protect public health and the environment; and (iii) the escape, flow or discharge of sewage sludge into state waters shall be prevented.” Purposeful use of the words “escape” and “flow” incorporate nonpoint sources of pollution.

CoV §10.1-104.2.A. further requires “The Department [DCR] shall operate a voluntary nutrient management training and certification program to certify the competence of persons preparing nutrient management plans for the purpose of assisting land owners and operators in the management of land application of fertilizers, municipal sewage sludges, animal manures, and other nutrient sources for agronomic benefits and **for the protection of the Commonwealth's ground and surface waters.**” (my emphasis.) In order to protect “... the Commonwealth’s ground and surface waters.” disposal of nutrients, including P, at rates in excess of the annual agronomic crop nutrient requirements as documented in “Standards” cannot be justified scientifically and is a violation of both State and Federal law.

The “Nutrient Management Training and Certification Regulations” are governed by Chapter 15 of the VAC, requiring that land application adheres to 4VAC5-15-140.D.5 “Crop nutrient needs per acre based on soil analysis results and soil productivity.” Further, in 4VAC5-15-150.2.a. “Determination of crop nutrient needs shall be consistent with tables and procedures contained in Virginia Nutrient Management Standards and Criteria, revised October 2005 ... and shall be based on soil test results for P₂O₅ and K₂O.

b. Nitrogen applications rates in nutrient management plans shall not exceed crop nutrient needs in subdivision 2 a of this subsection.

c. Phosphorus application rates shall be managed to minimize adverse water quality impacts consistent with subdivisions 2 c (1) through (5) of this subsection.

(1) Phosphorus applications from inorganic nutrient sources shall not exceed crop nutrient needs over the crop rotation based on a soil test.”

The regulation should read 4VAC5-15-150.2.c.1 “Phosphorus applications in nutrient management plans shall not exceed crop nutrient needs over the crop rotation based on a soil test.” There is absolutely no scientific reason to make a distinction between “inorganic” and “organic” forms of P, and the word “inorganic” should be deleted, so that all sources of P are applied so as “... not to exceed crop nutrient needs” as quantified in “Standards.” “Standards” clearly states (p. 100 and 107) that the P₂O₅ nutrient availability for animal waste is equal to the P₂O₅ analysis. Unlike N, where only a fraction of the N in the animal waste (Tables 8-2 and 9-1) is assumed to be rapidly mineralized and therefore crop available (and almost all of the remainder causes pollution), all the P in the waste is assumed to be crop available. The only reason a distinction is currently made between “inorganic” and “organic” P in animal waste is to promote cheap animal waste disposal to the detriment of water quality, and this distinction is not defensible from a scientific perspective.

The “Economic Impact” summarized in the Virginia Regulatory Town Hall Form: TH02 is grossly inadequate. It projects economic costs for implementation and to “individuals, businesses or other entities” but it fails to acknowledge the economic cost of pollution caused by the land application of such an inefficient “fertilizer.” A very few Virginia farmers save between about \$41 and \$71 per acre by using sludge (JLARC #89, 2005) on less than 2% of farmed acreage. The cost of N pollution has been estimated at between \$0.90 and \$2.25 per pound (J. Ag. Res. Econ. 27(2): 420-432; Env. Sci. Tech. 45: 168-174). Assuming that 30% of the nitrogen in sludge is “plant available” and most of the remainder is pollution, the cost of nitrogen pollution to society when sludge is used as fertilizer is over \$200 per acre. According to JLARC #89, about 232,000 dry tons of sludge are spread annually in Virginia. Averaging about 2.5% nitrogen, 11.6 million pounds of N are disposed annually. Assuming, charitably, that chemical fertilization rates for three years following sludge application are reduced according to Table 9-1 in “Standards,” 5.2 million pounds of N pollution is currently being sanctioned. If chemical fertilization rates subsequent to sludge application are not reduced, which is likely the case, then 8 million pounds of N pollution are being sanctioned. The cost of pollution is borne by society in order for a very few farmers to realize “...savings averaging about \$1,173 per farm.”

Chesapeake Bay is worth hundreds of billions of dollars annually to the Virginia economy (Executive Council Blue Ribbon Finance Panel, 2004; “The economic argument for cleaning up the Bay” Chesapeake Bay Foundation Report, Nov. 2010, and references therein), vastly more than the worth of the waste disposal or poultry sectors. Virginians overwhelmingly want a cleaner Bay. From an economic standpoint, disposing of sewage sludge by land application is much more costly to society, and to Virginia’s State and County income, than alternative uses like biofuel. Bay N pollution caused by

the land application of sewage sludge exceeds the N pollution caused by septic systems and accounts for a significant fraction of the difference between Virginia's 2002 N discharge to Chesapeake Bay (77.8 MPY) and the reduction goal required by EPA's 2025 Draft Allocation (53.7 MPY). The amount of P that is disposed (squandered) in excess of agronomic need by the land application of sludge is much larger than the difference between Virginia's 2002 P discharge to Chesapeake Bay (9.8 MPY) and EPA's 2025 Draft Allocation for P (5.4 MPY).

If land application was P-based, using the numerical limits in "Standards," as both Federal and State law require, and Bay water quality improved proportionately, the increased value of waterfront property and recreational and commercial fisheries would far exceed the value of land application to the agricultural and wastewater sectors. No analysis of "Economic Impact" by the State can ignore these incontestable facts.

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