clf
conservation law foundation

For a thriving New England

CLF Vermont
15 East State Street, Suite 4
Montpelier, VT 05602
P: 802.223.5992
F: 802.223.0060
www.clf.org

April 7, 2020

Dennis Fekert
Certification Section Chief, Solid Waste Management Program
Department of Environmental Conservation
Agency of Natural Resources
1 National Life Drive, Main 2
Montpelier, VT 05620-3521
Dennis.Fekert@vermont.gov
Via Electronic Mail

Re: Comments on Solid Waste Management Rules

Dear Mr. Fekert:

Conservation Law Foundation (CLF), Toxics Action Center, Vermont Natural Resources Council, Vermont Public Interest Research Group, and Vermont Conservation Voters respectfully submit these comments on the proposed changes to the Solid Waste Management Rules (SWMR). Our comments pertain specifically to Subchapter 13 of the Rules governing Residuals Management Facilities.

CLF protects New England's environment for the benefit of all people. CLF is a non-profit, member-supported organization with offices located in Vermont, Massachusetts, Rhode Island, Maine, and New Hampshire. CLF uses the law, science, and the market to create solutions that protect public health, preserve natural resources, build healthy communities, and sustain a vibrant economy. CLF has been a leading advocate for clean water and safe drinking water in Vermont and throughout New England.

Toxics Action Center (Toxics Action) was founded in 1987 in response to the Woburn contamination crisis. Toxics Action believes that everyone has the right to breathe clean air, drink clean water, and live in a healthy community with a government that operates responsively and democratically. We work to make those rights a reality by working side-by-side community groups fighting pollution threats in their neighborhoods and by training long-term leadership for the environmental and social change movements. Toxics Action has worked with community groups fighting PFAS drinking water contamination since February 2016 and facilitates the National PFAS Contamination Coalition, a network of nearly 30 community groups fighting PFAS contamination from 17 states and Guam.

Through research, education, collaboration and advocacy, Vermont Natural Resources Council (VNRC) protects and enhances Vermont's natural environments, vibrant

communities, productive working landscapes, rural character and unique sense of place, and prepares the state for future challenges and opportunities.

Vermont Public Interest Research Group (VPIRG) is the largest non-profit consumer and environmental advocacy organization in Vermont, with over 50,000 members and supporters. For over 45 years, VPIRG has brought the voice of average Vermont citizens to public policy debates concerning the environment, health care, consumer protection and democracy.

Founded in 1982, Vermont Conservation Voters (VCV) works to elect environmentally-friendly candidates to public office, and then holds elected officials accountable for the decisions they make affecting our air, water, communities, land, and wildlife.

The newly consolidated section of the SWMR governing residuals management facilities (Subchapter 13) contains several important steps forward in protecting public health and water quality from dangerous pollution as a result of residuals management. However, the proposed SWMR does not protect public health from toxic per- and polyfluoroalkyl substances (PFAS) chemicals.

PFAS are present in sewage sludge, biosolids (including exceptional quality (EQ) biosolids), and septage (hereinafter "residuals") and at land application sites where these materials are applied. PFAS are associated with serious adverse human health effects and are tremendously difficult and costly to clean up once released in the environment. To protect Vermont communities, the Agency of Natural Resources (Agency) should establish comprehensive controls to ensure that land application of residuals does not adversely impact public health and the environment. At a minimum, the Agency should revise the SWMR to include mandatory monitoring and reporting requirements to test residuals for the maximum number of PFAS substances detectable from standard laboratory methods before they can be land applied or distributed or marketed as a consumer product.

Additionally, the Agency should require comprehensive baseline and continued monitoring of PFAS in the soil, surface water, and groundwater at all land application sites. The Agency should also establish enforceable standards for PFAS in residuals and prohibit land application of residuals that pose a risk to public health and the environment.

Introduction

Robust monitoring of PFAS in residuals in advance of land application or sale to consumers is necessary to protect Vermont communities. Called 'forever chemicals' because they never fully break down, PFAS are a group of over 7,000 manmade chemicals used widely in products that many of us rely on every day – nonstick cookware, food wrappers, water-repellent clothing, stain-resistant fabrics and carpets, some cosmetics, some firefighting foams, and products that resist grease, water, and oil. It's estimated that almost every American has one of these toxic compounds in their blood. PFAS have been linked to a variety of health problems including kidney and testicular cancer; impaired liver, pancreatic and immune system function; thyroid disease; fertility and pregnancy issues; high blood pressure; and growth and learning problems in infants and children.

PFAS have been found at unsafe levels in the environment throughout Vermont, including drinking water, groundwater, surface waters, and soils. One of the primary exposure pathways to PFAS is through diet (likely due to food packaging containing PFAS as well as food products grown in PFAS-contaminated soil). Another significant exposure pathway is through consuming drinking water contaminated with PFAS. Spreading residuals containing PFAS onto the land contributes to these exposure pathways in two ways: (1) because PFAS are highly mobile in water, they can leach out of land-applied residuals and subsequently contaminate groundwater that serves, or potentially could serve, as a drinking water supply; and (2) livestock that either feed on crops grown in contaminated soil or irrigated with contaminated water can also uptake PFAS, which can then be transferred to animal milk.

The problem with PFAS contamination is we often do not know about it unless we look for it. Given that we know residuals contain harmful PFAS compounds, it is illogical that the Agency would update the Residuals Management Program Rules without addressing this serious threat to public health. We recommend the Agency revise the SWMR to at least require monitoring and reporting for the presence of these harmful PFAS in the residuals, as well as the soils, surface waters, and groundwater at the land application sites. The Agency should also establish enforceable standards for PFAS in residuals and prohibit land application of residuals that pose a risk to public health and the environment.

We are also providing initial comments on the Agency's "Guidance on PFAS and Biosolids," which was recently issued on April 3, 2020. We reserve the right to supplement those comments once we have had an opportunity to review more fully.

I. Legal authority

The Secretary of the Agency has broad authority to adopt rules pursuant to 3 V.S.A. chapter 25 to implement the provisions of chapter 159 (Waste Management).[1] Chapter 159 authorizes the Secretary to adopt rules to establish a testing program for all sewage sludge or similar liquid wastes, prior to their beneficial use on land, or prior to distribution and marketing of those wastes in liquid or solid form.[2] In addition, the state has an obligation to hold and protect groundwater and drinking water in the public trust.[3] The release of dangerous pollution to surface and groundwater is also prohibited.[4] Therefore, the Agency has the authority to and should adopt comprehensive controls to protect groundwater and drinking water from PFAS in residuals.

[1] 10 V.S.A. § 6603.
[2] 10 V.S.A. § 6604b(a).
[3] 10 V.S.A §§ 1390; *see also* Groundwater Protection Rule and Strategy, Environmental Protection Rules § 12-102 (2019) ("It is the purpose of this Rule to establish a system to protect the groundwater resources that are held in trust for the public.").
[4] 10 V.S.A. chapters 47, 59, and 159; Investigation and Remediation of Contaminated Properties Rule, Environmental Protection Rules § 35-102(a) ("The release of hazardous materials into the surface or groundwater, or onto the land of the State is prohibited.").

II. PFAS are harmful to public health

PFAS compounds are toxic in small quantities; extremely persistent in the environment; highly mobile in water; bioaccumulative, used in hundreds of commercial and manufacturing processes, and found in thousands of consumer products; and there are over 7,000 different kinds of these dangerous chemicals. They have been used in non-stick cookware, water-repellent clothing, stain resistant fabrics and carpets, cosmetics, firefighting foams, and other products that resist grease, water, and oil.[5]

PFAS are toxic to humans in concentrations as small as parts per trillion (ppt).[6] These chemicals are associated with cancer and have been linked to growth, learning, and behavioral problems in infants and children; fertility and pregnancy problems, including pre-eclampsia; interference with natural human hormones; increased cholesterol; immune system problems; and, interference with liver, thyroid, and pancreatic function.[7] PFAS have been linked to increases in testicular and kidney cancer in human adults.[8]

III. PFAS exposure from land application of residuals

Exposure to PFAS in residuals is not a new area of concern. The Environmental Protection Agency (EPA) discovered in 2009 that sludge containing high levels of both chemicals had made its way from a wastewater treatment facility in Decatur, Alabama, to nearby fields.[9] For 12 years, that contaminated sludge had been spread across 5,000 acres of local grazing land. Later testing confirmed that the chemicals had contaminated animals and humans in the rural area.[10]

PFAS in residuals have the potential to leach out of land-applied biosolids and subsequently contaminate groundwater that serves, or potentially could serve, as a drinking water supply.[11] Studies have shown that PFAS will readily leach out of biosolids and soils, are relatively soluble in water, and do not remain bound to organic matter in biosolids or soils.[12] While research demonstrates that dermal absorption of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) is minimal and its volatility is fairly low, meaning that mere skin contact with PFOA/PFOS contaminated biosolids presents minimal risk and the likelihood of excessive exposure via inhalation is also minimal, exposure from drinking

---

[5] *See Per- and Polyfluoroalkyl Substances (PFAS) and Your Health*, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, https://www.atsdr.cdc.gov/pfas/overview.html.
[6] Toxicological Profile for Perfluoroalkyls, U.S. DEP'T OF HEALTH & HUMAN SERV., AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY 5–6, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf.
[7] *Id.*
[8] *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVTL. HEALTH PERSPECTIVES 1313, 1313 (Nov.–Dec. 2013), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf.
[9] Sharon Learner, *Toxic PFAS Chemicals Found in Maine Farms Fertilized with Sewage Sludge*, THE INTERCEPT (June 7, 2019), https://theintercept.com/2019/06/07/pfas-chemicals-maine-sludge/.
[10] *Id*.
[11] Ernie Kelley & Eamon Twohig, *VT Dep't of Envtl. Conservation Residual Waste & Emerging Contaminants Program, Wastewater Treatment Sludge and Septage Management in Vermont* 41 (2018), https://dec.vermont.gov/sites/dec/files/wmp/residual/RMSWhitePaper20180507.pdf.
[12] *Id.*

contaminated water or from the ingestion of contaminated materials does present potential health risks in direct proportion to the amount of PFAS ingested.[13]

In addition, land-application of PFAS-contaminated residuals may lead to contamination of food products that are then consumed by humans. PFAS can migrate into fruits, vegetables, and grains that are grown in soils that are contaminated with PFAS.[14] In 2019, the Federal Drug Administration (FDA) released the results of an investigation showing detection of 16 PFAS chemicals in food samples collected from grocery stores in the mid-Atlantic region.[15] While the FDA says it is working to better understand the potential dietary exposure to PFAS, researchers have already clearly shown that vegetables can absorb PFAS chemicals from the soil into their leaves.[16]

PFAS may also lead to contamination of livestock that eat feed or graze on fields where biosolids were applied.[17] This terrifying prospect became reality for one dairy farmer in Arundel, Maine in 2018 when milk from his dairy was found to be contaminated with PFAS that had likely come from sludge that the farmer had spread on his land as fertilizer.[18]

IV. PFAS have been found in sludge and septage in Vermont, as well as in soils and groundwater where those residuals were land-applied

Harmful PFAS compounds have already been identified in sludge and septage at wastewater treatment facilities (WWTF) and industrial sites in Vermont.[19]

Recent sampling of soil and groundwater at land application sites throughout Vermont also showed presence of PFAS compounds. CLF only reviewed four of the dozen or so sampling reports submitted to the Agency.[20] However, even in these four reports (two municipal, one industrial, and one farm site), each report notes PFAS detections either in the soil at the land

---

[13] *Id.*
[14] Colin O'Neil and David Andrews, *FDA Tests Confirm Suspicions about PFAS chemicals in food*, ENVIRONMENTAL WORKING GROUP, (June 3, 2019), https://www.ewg.org/news-and-analysis/2019/06/fda-tests-confirm-suspicions-about-pfas-chemicals-food.
[15] Tom Neltner, *FDA finds surprisingly high levels of PFAS in certain foods – including chocolate cake*, ENVIRONMENTAL DEFENSE FUND, (June 3, 2019), http://blogs.edf.org/health/2019/06/03/fda-high-levels-pfas-chocolate-cake/.
[16] Blaine et al., *Perfluoroalkyl Acid Distribution in Various Plant Compartments of Edible Crops Grown in Biosolids-Amended soils*, ENVIRON. SCI. TECHNOL. 2014, 48, 14, 7858-7865.
[17] EPA, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)* 20, (May 2016) (finding that livestock can accumulate PFOS from eating contaminated feed or grazing on fields where biosolids were applied), https://www.epa.gov/sites/production/files/2016-05/documents/pfos_health_advisory_final_508.pdf.
[18] Richard Valdmanis, *The curious case of tainted milk from a Maine dairy farm*, REUTERS, (Mar. 19, 2019), https://www.reuters.com/article/us-usa-dairy-chemicals/the-curious-case-of-tainted-milk-from-a-maine-dairy-farm-idUSKCN1R01AJ.
[19] Weston and Sampson, *Poly- and Perfluoroalkyl Substances at Wastewater Treatment Facilities and Landfill Leachate Summary Report* 3-5 (Jan. 30, 2020) (noting PFAS was detected in all sludge samples, and two PFAS were detected in one out of six septage samples).
[20] This data should be released publicly as soon as possible in a format that is accessible to the public (i.e. summary, graphs).

application site or in the groundwater downgradient from the application site.[21] For example, sampling at the Town of Bradford's biosolids land application site indicated the presence of PFOS in one groundwater monitoring well at 46.3 ng/L, which exceeds the Vermont Groundwater Enforcement Standard (VGES) of 20 ng/L for the sum of the five regulated PFAS compounds.[22] Sampling at the St. Johnsbury biosolids land application sites also revealed several PFAS analytes above the VGES in groundwater monitoring wells at the North Danville Site (MW-12 had 110 ng/L of total regulated PFAS), and the Lyndonville Site (MW-5 and MW-8 had 151 ng/L and 104 ng/L of total regulated PFAS, respectively).[23] These results show that residual application is contaminating groundwater with PFAS.

These test results are on par with similar sampling done at residuals land application sites in the State of Maine. Of 44 samples taken last year from Maine farms and other facilities that distribute compost made from sludge, all contained at least one PFAS chemical.[24] In all but two of the samples, the chemicals exceeded regulatory thresholds for sludge set by Maine.[25]

V. The Agency must establish comprehensive controls to prevent exposure to unsafe levels of PFAS in soils, surface water, and groundwater

Land application of residuals is a significant potential source of PFAS exposure. Given the toxicity of PFAS in small concentrations, the extreme persistence of these dangerous chemicals in the environment, and the significant challenges of cleaning them up once they are released, it is critical that the Agency put in place controls to prevent the land application of residuals with PFAS concentrations that pose a risk to public health and the environment. While a great deal of public attention has recently been paid to PFOA, PFOS, and other long-chain PFAS, EPA and other scientists have raised concerns that other chemicals in the PFAS class of compounds are similar in chemical structure and are likely to pose similar health risks.[26] Accordingly, the Agency should take a class approach to managing PFAS in residuals. At a minimum, we

---

[21] CLF reviewed sampling reports from the Towns of Bradford, St. Johnsbury, Northstar/Vermont Yankee, and Garvey Farm.
[22] PFAS Sampling Town of Bradford Biosolids Land Application Site Report 2, Waite Heindel (Feb. 19, 2020).
[23] Letter Report for St. Johnsbury Biosolids and Septage Land Application Sites PFAS Evaluation 4-5, Stone Environmental (Feb. 21, 2020).
[24] Sharon Learner, *Toxic PFAS Chemicals Found In Maine Farms Fertilized With Sewage Sludge*, THE INTERCEPT (June 7, 2019), https://theintercept.com/2019/06/07/pfas-chemicals-maine-sludge/.
[25] *Id.*
[26] *See, e.g.*, Elsie Sunderland et al., *A review of the pathways of human exposure to poly- and perfluoroalkyl substances (PFASs) and present understanding of health effects*, 29 J. OF EXPOSURE SCI. & ENVTL. EPIDEMIOLOGY 131 – 147 (2018), *available at* https://www.nature.com/articles/s41370-018-0094-1 ("A recent hazard assessment based on the internal dose of Gen X[, a short-chain PFAS,] suggests that it has a higher toxicity than PFOA after accounting for toxicokinetic differences."); Consent Order, *In the matter of: Dupont Company,* (Nos. P-08-508 and P-08-509, U.S. E.P.A. Office of Pollution Prevention and Toxics, April 9, 2009), at vii (stating that, with respect to "GenX" compounds (chemical substances intended to replace long-chain (C8) PFAS used in Teflon), "EPA has concerns that these PMN substances will persist in the environment, could bioaccumulate, and be toxic ("PBT") to people, wild mammals, and birds.") *available at* https://assets.documentcloud.org/documents/2746607/Sanitized-Consent-Order-P08-0508-and-P08-0509.pdf; Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, 123 ENVTL. HEALTH PERSPECTIVES A 107, A 107 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

recommend the following controls be implemented as part of broader strategy to address PFAS in residuals.

First, PFAS should be added in section 1306(n)(1)(2) of the SWMR as a required sampling parameter for all sludges, biosolids (including EQ biosolids), or septage intended for land application or distribution/marketing. At a minimum, responsible parties should be required to test for the maximum number of PFAS substances detectable from standard laboratory methods. Such testing should occur at the same frequency as other parameters in subpart (n). These results should be included in the quarterly reports submitted to the Secretary pursuant to section 1308.

Second, any entity responsible for land application of sludge, biosolids, or septage should be required to conduct a round of representative sampling of the soils at the intended application site to obtain information about any existing PFAS contamination issues. Given that soil testing on several sites receiving residuals have shown detectable levels of PFAS, it is important to establish this baseline level of information before permitting additional residual application. This sampling information should be reviewed in tandem with the PFAS sampling results of the residuals to determine whether continued residuals application is safe. Soils at land application sites should also be tested on a regular basis to assess PFAS concentrations.

Third, entities responsible for land application of sludge, biosolids, or septage should also be required to conduct ongoing surface water sampling and groundwater sampling at the site, at compliance points, and downgradient of the application site to monitor impacts to surface and groundwater. Where enforcement standards are exceeded, the party must investigate and clean up releases of PFAS consistent with the Groundwater Protection Rule and Strategy and the Investigation and Remediation of Contaminated Properties Rule.

Fourth, the State should establish enforceable numeric standards to limit the amount of allowable PFAS in residuals intended for land application, or for management at a facility preparing, distributing, or marketing EQ biosolids. These standards should be set for the combined class of PFAS as opposed to individual compounds, and account for cumulative loading at land application sites. These standards should be incorporated into subsections (o) (concentration standards) and (q) (cumulative loading rate limits) of section 6-1306.[27]

Finally, the State should prohibit the land application of residuals with PFAS concentrations that are likely to adversely impact public health and the environment.

VI. ANR Guidance on PFAS in Biosolids issued on April 3, 2020

CLF has had limited time to review the recently issued ANR Guidance on PFAS in Biosolids (Guidance). We have several initial comments on this Guidance, included in the bullets below, but we reserve the right to provide additional comments once we have had an opportunity to more fully review the document.

[27] Note that in the Agency's "CLEAN" version of the SWMR posted online, subsection (p) appears to be mistakenly deleted.

- General: We are pleased to see the Agency taking the positive step forward of requiring routine monitoring and reporting of PFAS in residuals and on application sites. However, these new requirements, along with all the other requirements in the first four bullets of the Guidance, should be incorporated into the SWMR themselves. With respect to the frequency of monitoring, the Agency should harmonize the timing of PFAS monitoring to be consistent with the occurrence of other monitoring required by section 6-1306 (r) and (s).
- Class B: Any groundwater monitoring requirements should specify that sampling occur at *all* monitoring wells on site, not just at compliance points.
- Class A/Exceptional Quality (EQ) Biosolids:
    - We do not support exempting amounts that are distributed as one cubic yard or less from the disclaimer and recordkeeping requirements in this bullet. This exemption would prevent many residential gardeners from receiving critical information about the health risks of applying PFAS-contaminated EQ biosolids on smaller-scale home vegetable gardens.
    - In addition to the bullets included in the Guidance, the Best Management Practices (BMP) document should also include a summary explaining what PFAS are, why they end up in Class A/EQ biosolids, and why they are harmful to human health. This BMP provides an opportunity to educate the public about PFAS exposure pathways and the importance of source reduction.
- Reducing PFAS Inputs to Publicly Owned Treatment Works (POTWs): The minimal actions the State proposes are not sufficient. The State must develop comprehensive and mandatory controls to reduce PFAS inputs to POTWs. This plan would include outreach and education activities, but also include controls such as (1) addressing source reduction through either restrictions and eventual bans on the use, manufacture, sale, or distribution of widely used PFAS-containing consumer products; and (2) establishing surface water and pre-treatment discharge standards for PFAS in industrial discharges and wastewater effluent.

Conclusion

Thank you for the opportunity to provide these comments. We appreciate the Agency's attention to the significant public health and environmental problems posed by PFAS in residuals. We urge the Agency to revise the proposed Rules consistent with our recommendations to ensure that land application of residuals does not adversely impact human health and the environment.

Respectfully submitted,

_____

Elena Mihaly
Senior Attorney
CLF Vermont

Shaina Kasper
Vermont State Director
Toxics Action Center

Jon Groveman
Policy & Water Program Director
Vermont Natural Resources Council

Paul Burns
Executive Director
Vermont Public Interest Research Group

Lauren Hierl
Executive Director
Vermont Conservation Voters