



May 17, 2021

By email

Secretary Julie Moore
Vermont Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, VT 05620-3901

Secretary Anson Tebbetts
Vermont Agency of Agriculture, Food and Markets
116 State Street
Montpelier, VT, 05620-2901

Re: Agency action needed to address PFAS contamination in pesticides

Dear Secretary Moore and Secretary Tebbetts:

We write to alert you to the urgent issue of pesticides contaminated with per- and polyfluoroalkyl substances ("PFAS"), toxic "forever chemicals." Recent tests conducted by the U.S. Environmental Protection Agency ("EPA") and Public Employees for Environmental Responsibility ("PEER") have shown alarmingly high concentrations of PFAS in pesticide products registered and used in Vermont. We ask that your agencies take the following steps to protect Vermont's residents and environment from exposure to PFAS:

- (1) Prohibit or suspend distribution and use of pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Vermont for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

Overview of PFAS & Health Effects

Per- and polyfluoroalkyl substances, known as PFAS, are human-made chemicals used in hundreds of products and industrial processes. PFAS are known as “forever chemicals” because they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion (“ppt”).¹ 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.² PFAS have been linked to increases in testicular and kidney cancer in human adults.³

Alarming, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,⁴ and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.⁵ The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a “Statement on Potential Intersection between PFAS Exposure and COVID-19,” which recognized the “evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance.”⁶

PFAS Contamination in Pesticides

In fall 2020, Public Employees for Environmental Responsibility (“PEER”) tested the insecticide Anvil 10 + 10 (“Anvil”) and discovered that it contains PFAS. Specifically, PEER’s tests found 250 ppt of perfluorooctanoic acid (“PFOA”), and 260 – 500 ppt of hexafluoropropylene oxide dimer acid (“HFPO-DA”), a “GenX” replacement for PFOA.⁷ PFOA was phased out of production starting in 2006 because of serious concerns over its harmful effects on human health

¹ U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls* (June 2018), at 5–6, <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.

² *Id.*

³ *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf>.

⁴ Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), <https://pubmed.ncbi.nlm.nih.gov/30470793/>.

⁵ See U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

⁶ Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last visited Mar. 29, 2021).

⁷ Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

and the environment.⁸ PEER notified the Massachusetts Department of Environmental Protection (“DEP”) and the U.S. Environmental Protection Agency (“EPA”). In December 2020, the *Boston Globe* reported on PEER’s findings, confirming that DEP had tested Anvil and found levels of some PFAS compounds that substantially exceed the state’s new limits on PFAS in drinking water.⁹

Anvil, manufactured by Clarke, is used widely for mosquito control. At least twenty-six states – including Vermont – have used Anvil for mosquito control in recent years.¹⁰ Clarke stores and ships Anvil and some of its other pesticides in a type of plastic container called high density polyethylene (“HDPE”). Clarke’s HDPE containers are fluorinated in order to make them less permeable and reactive.¹¹ EPA testing revealed that the fluorinated containers used to store Anvil contain eight different PFAS compounds – including three PFAS compounds listed in Vermont’s new drinking water standards¹² – at levels ranging from 20-50 parts per billion.¹³

EPA’s theory is that the PFAS are likely leaching from the fluorinated containers into the pesticide stored inside.¹⁴ If the fluorinated containers are the source of the PFAS in Anvil, this problem likely extends well beyond pesticides produced by Clarke. This could be a problem for hundreds or even thousands of pesticide products, as fluorination is a common treatment for pesticide packaging.¹⁵

⁸ See U.S. Environmental Protection Agency, *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what> (last visited Mar. 29, 2021).

⁹ David Abel, *Toxic “Forever Chemicals” Found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes*, BOSTON GLOBE, December 1, 2020, <https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/>.

¹⁰ Public Employees for Environmental Responsibility, *Internet Search of State Use of Anvil 10 +10 in the United States* (November 23, 2020), <https://www.peer.org/wp-content/uploads/2020/11/State-use-of-Anvil-1010-updated-11.9.20.pdf?eType=EmailBlastContent&eId=1c783f1a-fbb9-4fe2-b9b5-a694dc19b99e>; See also Vermont Department of Public Health, *Aerial Spraying for Mosquitoes Set for Tonight in Brandon/Whiting Areas* (September 6, 2012), https://www.healthvermont.gov/sites/default/files/documents/2016/12/Aerial%20Spraying%20for%20Mosquitoes%20Set%20for%20Tonight%20in%20Brandon_Whiting%20Areas.pdf.

¹¹ U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021).

¹² Those three PFAS substances are PFOA, PFNA, and PFHpA. See U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021) (listing PFAS found in Anvil packaging); 16-3 Vt. Code R. § 500:6.12 (listing maximum contaminant levels for five PFAS).

¹³ U.S. Environmental Protection Agency, *Memorandum, EPA’s Analytical Chemistry Branch PFAS Testing: Rinses from Selected Fluorinated and Non-Fluorinated HDPE Containers*, 3 (March 4, 2021), https://www.epa.gov/sites/production/files/2021-03/documents/results-of-rinsates-samples_03042021.pdf.

¹⁴ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination*, (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

¹⁵ See, e.g., Office of the Indiana State Chemist and Seed Commissioner, Press Release, January 20, 2021, https://www.oisc.purdue.edu/pesticide/pdf/pfas_in_pesticide_statement_012021.pdf (“According [to] the EPA, ‘it is estimated that roughly 20-30% of all rigid agriculture chemical packaging in North America sold into the crop protection market are packaged in fluorinated HDPE containers.’”); Jeremy C. Fox, *EPA Finds Toxic Compounds in Mosquito Spray Used in Mass.; Maker Will Change Packaging*, BOSTON GLOBE, January 14, 2021, <https://www.bostonglobe.com/2021/01/15/metro/epa-finds-toxic-compounds-mosquito-spray-used-mass-maker-will-change-packaging/> (“Fluorinated packaging is widely used by the agricultural industry for finished goods,

Additional testing conducted by PEER has revealed PFAS contamination in the mosquito and tick control pesticide Mavrik Perimeter (“Mavrik”), manufactured by Zoecon, and the mosquito control pesticide Permanone 30–30 (“Permanone”), manufactured by Bayer Environmental Science.¹⁶ Both Mavrik and Permanone are registered for use in Vermont. PEER’s testing found PFAS present in Mavrik at a total concentration of 280 ppt.¹⁷ In Permanone, PEER found 3,500 ppt of PFOA and 630 ppt of HFPO-DA.¹⁸ As you are aware, Vermont’s drinking water standards set the maximum contaminant level of PFAS at 20 ppt, well below the PFAS levels in Mavrik and Permanone.¹⁹ EPA has not yet taken action on the discovery of PFAS in Mavrik, Permanone, and other pesticides. Clearly, these results suggest that PFAS contamination of pesticides is a widespread issue, affecting an unknown number of pesticide products. In addition to Anvil, Mavrik, and Permanone, PEER has discovered PFAS contamination in at least three other pesticides, which PEER will identify once it has completed final tests to confirm the PFAS contamination levels in those pesticides.

PEER’s recent findings also suggest that leaching from fluorinated containers is not the only source of PFAS contamination in pesticides. First, the Permanone PEER tested is sold in metal barrels, not the fluorinated HDPE barrels that Anvil is stored in.²⁰ Second, both the high levels of PFAS found in PEER’s most recent tests and the fact that the tests found different PFAS in many of the pesticides suggest that there is at least one other source of contamination in addition to fluorination of pesticide packaging. Possible sources include PFAS applied to the equipment used to manufacture or package the pesticides or PFAS that are intentionally added as “inert” ingredients to the pesticide products.

PFAS may be added to pesticides as inert ingredients without the public’s knowledge. Most pesticide manufacturers do not disclose the inert ingredients in their pesticide products. Inert ingredients must be approved by EPA, but they are not publicly disclosed if manufacturers claim them as trade secrets under federal pesticide law.²¹ EPA has approved a number of PFAS as permissible inert ingredients,²² but generally only EPA and the manufacturers know which pesticides contain PFAS.

including pesticides,’ [Clarke] said. ‘The potential for PFAS chemistry from the fluorinated packaging to leach into finished goods was unknown to Clarke.’”).

¹⁶ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, <https://www.eenews.net/stories/1063728605>.

¹⁷ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, *supra* note 16.

¹⁸ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, *supra* note 16.

¹⁹ See 16-3 Vt. Code R. § 500:6.12.

²⁰ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, *supra* note 16.. It is possible that Permanone is stored in HDPE barrels at some point in the manufacturing or distribution process, but the fact that PFAS exists in the Permanone delivered in metal barrels raises doubts that leaching from HDPE barrels fully explains the PFAS contamination PEER discovered.

²¹ See 7. U.S.C. § 136h (permitting applicants for federal pesticide registration to declare certain information about the pesticide, including the identity of inert ingredients, as non-disclosable trade secrets).

²² See Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

The Agency of Natural Resources' Authority to Regulate PFAS in Vermont's Environment

The Vermont Agency of Natural Resources has legal authority to protect residents and the environment from PFAS-contaminated pesticides by investigating PFAS contamination in the environment and requiring compliance with state water safety standards. The Agency has broad authority to prevent and minimize environmental health hazards, including the power to “regulate the purity of drinking water, the adequacy, construction, and operation of public water systems, public water sources, and public water source protection areas.”²³ The legislature has recognized PFAS as a threat to the state’s water and environment, and consequently empowered the Agency to set limits on PFAS contamination of drinking waters and surface waters. Act 21, enacted in 2019, requires that all community waters be sampled annually for PFAS and charges the Agency with establishing limits for PFAS in drinking water, setting surface water quality standards, and conducting a statewide investigation into the sources of PFAS contamination in Vermont’s environment, actions on which the Agency has already made progress.²⁴ Recently, both chambers of the legislature passed S. 20, nation-leading legislation that would restrict the sale of consumer products that contain PFAS.²⁵ S. 20 underlines the legislature’s concern with PFAS contamination in products and the environment.

In March 2020 the Agency promulgated a rule establishing an MCL of 20 ppt for five PFAS.²⁶ One of these five PFAS – PFOA – appeared in PEER’s tests of Anvil and Permanone at concentrations of 250 and 3,500 ppt, respectively. These levels far exceed Vermont’s MCL, and require immediate action from the Agency to protect the state’s waters and safeguard public health.

Action by the Agency on the issue of PFAS in pesticides would be consistent with Vermont’s larger efforts to investigate the sources of PFAS contamination in the environment and to hold manufacturers and polluters accountable. The state has brought two landmark lawsuits against PFAS manufacturers and distributors, seeking compensation for widespread damage to Vermont’s environment and the costs associated with removing PFAS from the environment.²⁷ The recent discovery of PFAS in Anvil, Mavrik, Permanone, and other pesticides indicates an additional source of PFAS contamination in Vermont’s environment, which the Agency should investigate in support of the State’s efforts to hold polluters accountable.

²³ Vt. Stat. Ann. tit. 10 § 1672

²⁴ Act 21 of 2019.

²⁵ See S. 20, 2021-2022 Reg. Sess. (Vt. 2021)

²⁶ See 16-3 Vt. Code R. § 500:6.12.

²⁷ Office of the Vermont Attorney General, *Vermont Files Suit Against Manufacturers of PFAS Chemicals to Protect Drinking Water and Natural Resources* (June 27, 2019), <https://ago.vermont.gov/blog/2019/06/27/vermont-files-suit-against-manufacturers-of-pfas-chemicals-to-protect-drinking-water-and-natural-resources/>.

The Agency of Agriculture, Food and Markets' Authority to Regulate PFAS in Pesticides

Vermont law grants the Agency of Agriculture, Food and Markets broad authority to regulate pesticide distribution, use, and application within Vermont. The Agency's authority includes the power to promulgate "rules and regulations providing for the collection and examination of samples of economic poisons,"²⁸ and to "[r]equire correction of sources of pesticide contamination that threaten human health or the environment."²⁹ Under that authority, there are a range of actions that the Agency could take to protect the environment and residents of Vermont from exposure to PFAS-contaminated pesticides. The Agency has the authority to cancel the state registration of any pesticide that does not comply with Vermont's pesticide laws.³⁰ The agency also may seize adulterated or misbranded pesticides³¹ and may deny permits for the use of mosquito control pesticides.³²

The Agency would not be alone in exercising its authority over pesticides to protect people and the environment. For example, the New York Department of Environmental Conservation acted quickly after learning of the presence of PFAS in Anvil by "quarantine[ing] Anvil 10 + 10 products statewide" and "launching a comprehensive investigation into the universe and use of products stored in [fluorinated HDPE] containers."³³

It is critical that the Agency act swiftly to protect residents and the environment. Waiting for EPA to address the issue puts residents and the environment at unnecessary risk. EPA has so far relied primarily on voluntary action by Clarke to recall Anvil shipped in fluorinated containers. According to EPA, Clarke has "voluntarily stopped shipment of any products in fluorinated HDPE containers and is conducting its own testing to confirm EPA results and product stability in un-fluorinated containers."³⁴ EPA has "asked states with existing stock of [Anvil] distributed in fluorinated HDPE containers to discontinue use and hold until its final disposition is determined."³⁵ EPA's requests for voluntary action are insufficient to address the serious dangers posed by PFAS-contaminated pesticides. EPA's actions do not apply to Mavrik, Permanone, or any other contaminated pesticide and do not apply to consumers, certified applicators, or others who may possess or apply PFAS-contaminated pesticides. The Agency must act to protect residents and the environment.

²⁸ Vt. Stat. Ann. tit. 6, § 915.

²⁹ Vt. Stat. Ann. tit. 6, § 1104 (15).

³⁰ Vt. Stat. Ann. tit. 6, § 918.

³¹ Vt. Stat. Ann. tit. 6, § 921.

³² Vt. Stat. Ann. tit. 6, § 1083.

³³ New York Department of Environmental Conservation, *Statement from New York State Department of Environmental Conservation Commissioner Basil Seggos on New Investigation of Potential PFAS Contamination* (January 15, 2021), <https://www.dec.ny.gov/press/122184.html>.

³⁴ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

³⁵ *Id.*

CLF and PEER's Requests

Given the dangers PFAS pose to Vermont's residents and environment and the growing evidence of widespread PFAS contamination in pesticides, CLF and PEER reiterate our request that your agencies take the following actions:

- (1) Prohibit or suspend distribution and use of Anvil, Mavrik, Permanone, and any other pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Vermont for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

We appreciate your prompt attention to this urgent issue of public and environmental health and await your response.

Sincerely,



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May 17, 2021

By email

Commissioner Katie Dykes
Connecticut Department of Energy and Environmental Protection
79 Elm St.
Hartford, CT 06106

Commissioner Deidre Gifford
Connecticut Department of Public Health
410 Capitol Ave.
Hartford CT 06134

Re: Agency action needed to address PFAS contamination in pesticides

Dear Commissioners Dykes and Gifford,

We write to alert you to the urgent issue of pesticides contaminated with per- and polyfluoroalkyl substances ("PFAS"), toxic "forever chemicals." Recent tests conducted by the U.S. Environmental Protection Agency ("EPA") and Public Employees for Environmental Responsibility ("PEER") have shown alarmingly high concentrations of PFAS in pesticide products registered and used in Connecticut. We ask that the Department of Energy and Environmental Protection and the Department of Public Health take the following steps to protect Connecticut's residents and environment from exposure to PFAS:

- (1) Prohibit or suspend distribution and use of pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Connecticut for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides including identifying and addressing environmental contamination and potential health impacts; and
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Overview of PFAS & Health Effects

Per- and polyfluoroalkyl substances, known as PFAS, are human-made chemicals used in hundreds of products and industrial processes. PFAS are known as “forever chemicals” because they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion (“ppt”).¹ 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.² PFAS have been linked to increases in testicular and kidney cancer in human adults.³

Alarming, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,⁴ and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.⁵ The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a “Statement on Potential Intersection between PFAS Exposure and COVID-19,” which recognized the “evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance.”⁶

PFAS Contamination in Pesticides

In fall 2020, Public Employees for Environmental Responsibility (“PEER”) tested the insecticide Anvil 10 + 10 (“Anvil”) and discovered that it contains PFAS. Specifically, PEER’s tests found 250 ppt of perfluorooctanoic acid (“PFOA”), and 260 – 500 ppt of hexafluoropropylene oxide dimer acid (“HFPO-DA”), a “GenX” replacement for PFOA.⁷ PFOA was phased out of production starting in 2006 because of serious concerns over its harmful effects on human health

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² *Id.*

³ *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf>.

⁴ Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), <https://pubmed.ncbi.nlm.nih.gov/30470793/>.

⁵ See U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

⁶ Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last visited Mar. 29, 2021).

⁷ Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

and the environment.⁸ PEER notified the Massachusetts Department of Environmental Protection (“DEP”) and the U.S. Environmental Protection Agency (“EPA”). In December 2020, the *Boston Globe* reported on PEER’s findings, confirming that DEP had tested Anvil and found levels of some PFAS compounds that substantially exceed the state’s new limits on PFAS in drinking water.⁹

Anvil, manufactured by Clarke, is used widely for mosquito control. At least twenty-six states – including Connecticut – have used Anvil for mosquito control in recent years.¹⁰ Clarke stores and ships Anvil and some of its other pesticides in a type of plastic container called high density polyethylene (“HDPE”). Clarke’s HDPE containers are fluorinated in order to make them less permeable and reactive.¹¹ EPA testing revealed that the fluorinated containers used to store Anvil contain eight different PFAS compounds – including three PFAS compounds listed in Connecticut’s Drinking Water Action Levels.¹² – at levels ranging from 20,000-50,000 parts per trillion.¹³ For reference, Connecticut’s Drinking Water Action Level for PFAS is 70 ppt.¹⁴

EPA’s theory is that the PFAS are likely leaching from the fluorinated containers into the pesticide stored inside.¹⁵ If the fluorinated containers are the source of the PFAS in Anvil, this problem likely extends well beyond pesticides produced by Clarke. This could be a problem for hundreds or even thousands of pesticide products, as fluorination is a common treatment for pesticide packaging.¹⁶

⁸ See U.S. Environmental Protection Agency, *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what> (last visited Mar. 29, 2021).

⁹ David Abel, *Toxic “Forever Chemicals” Found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes*, BOSTON GLOBE, December 1, 2020, <https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/>.

¹⁰ Public Employees for Environmental Responsibility, *Internet Search of State Use of Anvil 10 +10 in the United States* (November 23, 2020), <https://www.peer.org/wp-content/uploads/2020/11/State-use-of-Anvil-1010-updated-11.9.20.pdf?eType=EmailBlastContent&eId=1c783f1a-fbb9-4fe2-b9b5-a694dc19b99e>; See also Vermont Department of Public Health, *Aerial Spraying for Mosquitoes Set for Tonight in Brandon/Whiting Areas* (September 6, 2012), https://www.healthvermont.gov/sites/default/files/documents/2016/12/Aerial%20Spraying%20for%20Mosquitoes%20Set%20for%20Tonight%20in%20Brandon_Whiting%20Areas.pdf.

¹¹ U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021).

¹² Those three PFAS substances are PFOA, PFNA, and PFHpA. See U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021) (listing PFAS found in Anvil packaging); Connecticut Department of Public Health, *Action Level List for Drinking Water*, <https://portal.ct.gov/DPH/Environmental-Health/Environmental-and-Occupational-Health-Assessment/Action-List-for-Drinking-Water> (last visited April 22, 2021) (establishing a Drinking Water Action Level for five PFAS).

¹³ U.S. Environmental Protection Agency, *Memorandum, EPA’s Analytical Chemistry Branch PFAS Testing: Rinses from Selected Fluorinated and Non-Fluorinated HDPE Containers*, 3 (March 4, 2021), https://www.epa.gov/sites/production/files/2021-03/documents/results-of-rinsates-samples_03042021.pdf.

¹⁴ Connecticut Department of Public Health, *Action Level List for Drinking Water*, *supra* note 12.

¹⁵ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination*, (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

¹⁶ See, e.g., Office of the Indiana State Chemist and Seed Commissioner, Press Release, January 20, 2021, https://www.oisc.purdue.edu/pesticide/pdf/pfas_in_pesticide_statement_012021.pdf (“According [to] the EPA, ‘it is estimated that roughly 20-30% of all rigid agriculture chemical packaging in North America sold into the crop protection market are packaged in fluorinated HDPE containers.’”); Jeremy C. Fox, *EPA Finds Toxic Compounds in*

Additional testing conducted by PEER has revealed PFAS contamination in the mosquito and tick control pesticide Mavrik Perimeter (“Mavrik”), manufactured by Zoecon, and the mosquito control pesticide Permanone 30–30 (“Permanone”), manufactured by Bayer Environmental Science.¹⁷ Both Mavrik and Permanone are registered for use in Connecticut. PEER’s testing found PFAS present in Mavrik at a total concentration of 280 ppt.¹⁸ In Permanone, PEER found 3,500 ppt of PFOA and 630 ppt of HFPO-DA.¹⁹ These results indicated levels of PFAS contamination far exceeding Connecticut’s Drinking Water Action Level for PFAS of only 70 ppt.²⁰ EPA has not yet taken action on the discovery of PFAS in Mavrik, Permanone, and other pesticides. Clearly, these results strongly suggest that PFAS contamination of pesticides is a widespread issue, affecting an unknown number of pesticide products. In addition to Anvil, Mavrik, and Permanone, PEER has discovered PFAS contamination in at least three other pesticides, which PEER will identify once it has completed final tests to confirm the PFAS contamination levels in those pesticides.

PEER’s recent findings also suggest that leaching from fluorinated containers is not the only source of PFAS contamination in pesticides. First, the Permanone PEER tested is sold in metal barrels, not the fluorinated HDPE barrels that Anvil is stored in.²¹ Second, both the high levels of PFAS found in PEER’s most recent tests and the fact that the tests found different PFAS in many of the pesticides suggest that there is at least one other source of contamination in addition to fluorination of pesticide packaging. Possible sources include PFAS applied to the equipment used to manufacture or package the pesticides or PFAS that are intentionally added as “inert” ingredients to the pesticide products.

PFAS may be added to pesticides as inert ingredients without the public’s knowledge. Most pesticide manufacturers do not disclose the inert ingredients in their pesticide products. Inert ingredients must be approved by EPA, but they are not publicly disclosed if manufacturers claim them as trade secrets under federal pesticide law.²² EPA has approved a number of PFAS as permissible inert ingredients,²³ but generally only EPA and the manufacturers know which pesticides contain PFAS.

Mosquito Spray Used in Mass.; Maker Will Change Packaging, BOSTON GLOBE, January 14, 2021, <https://www.bostonglobe.com/2021/01/15/metro/epa-finds-toxic-compounds-mosquito-spray-used-mass-maker-will-change-packaging/> (“Fluorinated packaging is widely used by the agricultural industry for finished goods, including pesticides,” [Clarke] said. “The potential for PFAS chemistry from the fluorinated packaging to leach into finished goods was unknown to Clarke.”).

¹⁷ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, <https://www.eenews.net/stories/1063728605>.

¹⁸ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, *supra* note 17.

¹⁹ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, *supra* note 17.

²⁰ Connecticut Department of Public Health, *Action Level List for Drinking Water*, *supra* note 12.

²¹ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*. It is possible that Permanone is stored in HDPE barrels at some point in the manufacturing or distribution process, but the fact that PFAS exists in the Permanone delivered in metal barrels raises doubts that leaching from HDPE barrels fully explains the PFAS contamination PEER discovered.

²² See 7. U.S.C. § 136h (permitting applicants for federal pesticide registration to declare certain information about the pesticide, including the identity of inert ingredients, as non-disclosable trade secrets).

²³ See Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

The Authority of the Departments to Regulate PFAS in Connecticut’s Environment

The Department of Energy and Environmental Protection (DEEP) and the Department of Public Health (DPH) have the legal authority to protect residents and the environment from PFAS-contaminated pesticides by monitoring for PFAS in the environment and requiring compliance with state water quality standards. DEEP has a broad mandate to ensure the safety of Connecticut’s waters, especially those that serve as a source of drinking water.²⁴ DEEP is charged with regulating the quality of the state’s waters in order to, among other purposes, “protect the public health and welfare and promote the economic development of the state; and . . . [ensure consistency] with health standards as established by the Department of Public Health.”²⁵

Consistent with that mandate, DEEP and DPH co-led the Connecticut Interagency PFAS Task Force convened by Governor Lamont. The PFAS Action Plan produced by the Task Force supports agency action on PFAS-contaminated pesticides. The Action Plan acknowledges that PFAS “easily migrate in the environment and cause contamination of soil, sediment, groundwater, and surface water,” and are linked to “human health effects ranging from developmental effects in fetuses and infants to certain forms of cancer.”²⁶ To protect public health and the environment, the Task Force recommended testing for PFAS in drinking water sources, especially drinking water “proximal to areas with suspected or confirmed PFAS contamination.”²⁷ In addition, the Task Force recommended “[r]equir[ing] testing of environmental media at sites where PFAS are likely to have been released,” and “[i]dentify[ing] and address[ing] other significant sources of PFAS contamination.”²⁸ PFAS-contaminated pesticides are a newly identified and likely significant source of PFAS contamination, which DEEP and DPH should address.

Finally, and as previously mentioned, DPH has set a Drinking Water Action Level for five PFAS at 70 ppt.²⁹ One of these five PFAS – PFOA – appeared in PEER’s tests of Anvil and Permanone at concentrations of 250 and 3,500 ppt, respectively. These concentrations far exceed Connecticut’s Drinking Water Action Level and highlight the risks that PFAS-contaminated pesticides pose to Connecticut’s residents and environment. DEEP and DPH should act immediately to protect the state’s waters and safeguard public health.

The Department of Energy and Environmental Protection’s Authority to Regulate PFAS in Pesticides

Chapter 441 of the General Statutes grants the Department broad authority to regulate pesticide distribution, use, and application within Connecticut. Under that authority, there are a range of

²⁴ See Conn. Gen. Stat. Ann. § 22a-426 (“The Commissioner of Energy and Environmental Protection shall adopt regulations . . . to establish standards of water quality applicable to the various waters of the state or portions thereof.”); Conn. Agencies Regs. § 22a-426-1 et seq. (Connecticut Water Quality Standards).

²⁵ Conn. Agencies Regs. § 22a-426-3 (a).

²⁶ Connecticut Interagency PFAS Taskforce, *PFAS Action Plan* (November 1, 2019), at 4, <https://portal.ct.gov/-/media/Office-of-the-Governor/News/20191101-CT-Interagency-PFAS-Task-Force-Action-Plan.pdf>.

²⁷ *Id.* at 2.

²⁸ *Id.*

²⁹ Connecticut Department of Public Health, *Action Level List for Drinking Water*, *supra* note 12.

actions that the Department could take to protect the residents and the environment from exposure to PFAS-contaminated pesticides. Most significantly, the Department has the authority to cancel or suspend the state registration for any pesticide that “causes unreasonable adverse effects on the environment,” or which poses “an imminent hazard.”³⁰

In addition, the Department has the authority to “prohibit the use of any pesticides by officials of towns, cities or boroughs or their agents when such use would result in unreasonable adverse effects on the environment,”³¹ and may issue “stop sale, use, or removal order[s].”³² For purposes of enforcing Connecticut’s pesticide laws, the Department may “obtain samples of any pesticides or devices packaged, labeled and released for shipment and samples of any containers or labeling for such pesticides or devices; and . . . obtain samples of any pesticides or devices that have been used; and obtain samples of any containers or labeling for such pesticides or devices.”³³

The Department would not be alone in exercising its authority over pesticides to protect people and the environment. For example, the New York Department of Environmental Conservation acted quickly after learning of the presence of PFAS in Anvil by “quarantine[ing] Anvil 10 + 10 products statewide” and “launching a comprehensive investigation into the universe and use of products stored in [fluorinated HDPE] containers.”³⁴

It is critical that the Department act swiftly to protect residents and the environment. Waiting for EPA to address the issue puts residents and the environment at unnecessary risk. EPA has so far relied primarily on voluntary action by Clarke to recall Anvil shipped in fluorinated containers. According to EPA, Clarke has “voluntarily stopped shipment of any products in fluorinated HDPE containers and is conducting its own testing to confirm EPA results and product stability in un-fluorinated containers.”³⁵ EPA has “asked states with existing stock of [Anvil] distributed in fluorinated HDPE containers to discontinue use and hold until its final disposition is determined.”³⁶ EPA’s requests for voluntary action are insufficient to address the serious dangers posed by PFAS-contaminated pesticides. EPA’s actions do not apply to Mavrik, Permanone, or any other contaminated pesticide and do not apply to consumers, certified applicators, or others who may possess or apply PFAS-contaminated pesticides. The Department must act to protect residents and the environment.

³⁰ Conn. Gen. Stat. Ann. §§ 22a–52(c), 22a–53(a).

³¹ Conn. Gen. Stat. Ann. § 22a–66.

³² Conn. Gen. Stat. Ann. § 22a–62.

³³ Conn. Gen. Stat. Ann. § 22a–59(a).

³⁴ New York Department of Environmental Conservation, *Statement from New York State Department of Environmental Conservation Commissioner Basil Seggos on New Investigation of Potential PFAS Contamination* (January 15, 2021), <https://www.dec.ny.gov/press/122184.html>.

³⁵ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

³⁶ *Id.*

CLF and PEER's Requests

Given the dangers PFAS pose to Connecticut's residents and environment and the growing evidence of widespread PFAS contamination in pesticides, CLF and PEER reiterate our request that your departments take the following actions:

- (1) Prohibit or suspend distribution and use of Anvil, Mavrik, Permanone, and any other pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Connecticut for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

We appreciate your prompt attention to this urgent issue of public and environmental health and await your response. A representative of CLF and PEER will reach out to your offices in the days ahead to suggest dates for a follow-up meeting.

Sincerely,



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May 17, 2021

By email

Commissioner John Lebeaux
Massachusetts Department of Agricultural Resources
251 Causeway St. #500
Boston, MA 02114

Commissioner Martin Suuberg
Massachusetts Department of Environmental Protection
1 Winter St.
Boston, MA 02108

Re: Agency action needed to address PFAS contamination in pesticides

Dear Commissioners Lebeaux and Suuberg,

We write to alert you to the urgent issue of pesticides contaminated with per- and polyfluoroalkyl substances (“PFAS”), toxic “forever chemicals.” Recent tests conducted by the U.S. Environmental Protection Agency (“EPA”) and Public Employees for Environmental Responsibility (“PEER”) have shown alarmingly high concentrations of PFAS in pesticide products registered and used in Massachusetts. We ask that the Department of Agricultural Resources and the Department of Environmental Protection take the following steps to protect Massachusetts’ residents and environment from exposure to PFAS:

- (1) Prohibit or suspend distribution and use of pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Massachusetts for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Public Health and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

Overview of PFAS & Health Effects

Per- and polyfluoroalkyl substances, known as PFAS, are human-made chemicals used in hundreds of products and industrial processes. PFAS are known as “forever chemicals” because they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion (“ppt”).¹ 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.² PFAS have been linked to increases in testicular and kidney cancer in human adults.³

Alarming, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,⁴ and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.⁵ The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a “Statement on Potential Intersection between PFAS Exposure and COVID-19,” which recognized the “evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance.”⁶

PFAS Contamination in Pesticides

In fall 2020, Public Employees for Environmental Responsibility (“PEER”) tested the insecticide Anvil 10 + 10 (“Anvil”) and discovered that it contains PFAS. Specifically, PEER’s tests found 250 ppt of perfluorooctanoic acid (“PFOA”), and 260 – 500 ppt of hexafluoropropylene oxide dimer acid (“HFPO-DA”), a “GenX” replacement for PFOA.⁷ PFOA was phased out of production starting in 2006 because of serious concerns over its harmful effects on human health

¹ U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls* (June 2018), at 5–6, <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.

² *Id.*

³ *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf>.

⁴ Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), <https://pubmed.ncbi.nlm.nih.gov/30470793/>.

⁵ See U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

⁶ Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last visited Mar. 29, 2021).

⁷ Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

and the environment.⁸ PEER notified the Massachusetts Department of Environmental Protection (“DEP”) and the U.S. Environmental Protection Agency (“EPA”). In December 2020, the *Boston Globe* reported on PEER’s findings, confirming that DEP had tested Anvil and found levels of some PFAS compounds that substantially exceed the state’s new limits on PFAS in drinking water.⁹

Anvil, manufactured by Clarke, is routinely used in Massachusetts for mosquito control. At least twenty-five other states – including Connecticut, Rhode Island, and Vermont – have used Anvil for mosquito control in recent years.¹⁰ In Massachusetts, the state has sprayed Anvil from aircraft over millions of acres.¹¹

Clarke stores and ships Anvil and some of its other pesticides in a type of plastic container called high density polyethylene (“HDPE”). Clarke’s HDPE containers are fluorinated in order to make them less permeable and reactive.¹² EPA testing revealed that the fluorinated containers used to store Anvil contain eight different PFAS compounds – including three PFAS compounds listed in Massachusetts’ new drinking water standards¹³ – at levels ranging from 20-50 parts per billion.¹⁴

EPA’s theory is that the PFAS are likely leaching from the fluorinated containers into the pesticide stored inside.¹⁵ If the fluorinated containers are the source of the PFAS in Anvil, this problem likely extends well beyond pesticides produced by Clarke. This could be a problem for hundreds or even thousands of pesticide products, as fluorination is a common treatment for pesticide packaging.¹⁶

⁸ See U.S. Environmental Protection Agency, *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what> (last visited Mar. 29, 2021).

⁹ David Abel, *Toxic “Forever Chemicals” Found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes*, BOSTON GLOBE, December 1, 2020, <https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/>.

¹⁰ Public Employees for Environmental Responsibility, *Internet Search of State Use of Anvil 10 +10 in the United States* (November 23, 2020), <https://www.peer.org/wp-content/uploads/2020/11/State-use-of-Anvil-1010-updated-11.9.20.pdf?eType=EmailBlastContent&eId=1c783f1a-fbb9-4fe2-b9b5-a694dc19b99e>.

¹¹ See Abel, *supra* note 6.

¹² U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021).

¹³ Those three PFAS substances are PFOA, PFNA, and PFHpA. See U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021) (listing PFAS found in Anvil packaging); 310 CMR § 22.07G (listing PFAS compounds regulated under Massachusetts’ drinking water standards).

¹⁴ U.S. Environmental Protection Agency, *Memorandum, EPA’s Analytical Chemistry Branch PFAS Testing: Rinses from Selected Fluorinated and Non-Fluorinated HDPE Containers*, 3 (March 4, 2021), https://www.epa.gov/sites/production/files/2021-03/documents/results-of-rinsates-samples_03042021.pdf.

¹⁵ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination*, (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

¹⁶ See, e.g., Office of the Indiana State Chemist and Seed Commissioner, Press Release, January 20, 2021, https://www.oisc.purdue.edu/pesticide/pdf/pfas_in_pesticide_statement_012021.pdf (“According [to] the EPA, ‘it is estimated that roughly 20-30% of all rigid agriculture chemical packaging in North America sold into the crop protection market are packaged in fluorinated HDPE containers.’”); Jeremy C. Fox, *EPA Finds Toxic Compounds in Mosquito Spray Used in Mass.; Maker Will Change Packaging*, BOSTON GLOBE, January 14, 2021, <https://www.bostonglobe.com/2021/01/15/metro/epa-finds-toxic-compounds-mosquito-spray-used-mass-maker->

Additional testing conducted by PEER has revealed PFAS contamination in the mosquito and tick control pesticide Mavrik Perimeter (“Mavrik”), manufactured by Zoecon, and the mosquito control pesticide Permanone 30–30 (“Permanone”), manufactured by Bayer Environmental Science.¹⁷ Both Mavrik and Permanone are registered for use in Massachusetts. PEER’s testing found PFAS present in Mavrik at a total concentration of 280 ppt.¹⁸ In Permanone, PEER found 3,500 ppt of PFOA and 630 ppt of HFPO-DA.¹⁹ For reference, Massachusetts’ drinking water standards set the maximum contaminant level of PFAS at 20 ppt.²⁰ EPA has not yet taken action on the discovery of PFAS in Mavrik, Permanone, and other pesticides. Clearly, these results strongly suggest that PFAS contamination of pesticides is a widespread issue, affecting an unknown number of pesticide products. In addition to Anvil, Mavrik, and Permanone, PEER has discovered PFAS contamination in at least three other pesticides, which PEER will identify once it has completed final tests to confirm the PFAS contamination levels in those pesticides.

PEER’s recent findings also suggest that leaching from fluorinated containers is not the only source of PFAS contamination in pesticides. First, the Permanone PEER tested is sold in metal barrels, not the fluorinated HDPE barrels that Anvil is stored in.²¹ Second, both the high levels of PFAS found in PEER’s most recent tests and the fact that the tests found different PFAS in many of the pesticides suggest that there is at least one other source of contamination in addition to fluorination of pesticide packaging. Possible sources include PFAS applied to the equipment used to manufacture or package the pesticides or PFAS that are intentionally added as “inert” ingredients to the pesticide products.

PFAS may be added to pesticides as inert ingredients without the public’s knowledge. Most pesticide manufacturers do not disclose the inert ingredients in their pesticide products. Inert ingredients must be approved by EPA, but they are not publicly disclosed if manufacturers claim them as trade secrets under federal pesticide law.²² EPA has approved a number of PFAS as permissible inert ingredients,²³ but generally only EPA and the manufacturers know which pesticides contain PFAS.

[will-change-packaging/](#) (“Fluorinated packaging is widely used by the agricultural industry for finished goods, including pesticides,” [Clarke] said. “The potential for PFAS chemistry from the fluorinated packaging to leach into finished goods was unknown to Clarke.”).

¹⁷ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, <https://www.eenews.net/stories/1063728605>.

¹⁸ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, *supra* note 17.

¹⁹ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, *supra* note 17.

²⁰ 310 CMR § 22.07G (setting maximum contaminant level at 20 nanograms / liter, which equals 20 ppt).

²¹ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, *supra* note 17. It is possible that Permanone is stored in HDPE barrels at some point in the manufacturing or distribution process, but the fact that PFAS exists in the Permanone delivered in metal barrels raises doubts that leaching from HDPE barrels fully explains the PFAS contamination PEER discovered.

²² See 7. U.S.C. § 136h (permitting applicants for federal pesticide registration to declare certain information about the pesticide, including the identity of inert ingredients, as non-disclosable trade secrets).

²³ See Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

The Department of Environmental Protection’s Authority to Regulate PFAS in the Environment

The Department of Environmental Protection has legal authority to protect residents and the environment from PFAS-contaminated pesticides by monitoring for PFAS in the environment and requiring compliance with state environmental laws. The Department has “broad authority to protect water quality,” including by carrying out the state’s Clean Waters Act, which establishes “a comprehensive program for protection of the surface and groundwaters of the Commonwealth.”²⁴ As part of that mandate, the Department may “[a]dopt, amend or repeal . . . rules and regulations which it deems necessary for the proper administration of the laws relative to water pollution control and to the protection of the quality and value of water resources.”²⁵ This includes the authority to “address atypical or novel threats that may also harm [the state’s water] resources.”²⁶

DEP has already determined that PFAS pose dangers to residents and the environment and has promulgated regulations addressing PFAS contamination.²⁷ The Department has amended the Massachusetts Contingency Plan to address PFAS contamination in the environment by establishing “(a) [r]eportable [c]oncentrations and [r]eportable [q]uantities for PFAS; (b) PFAS cleanup standards in soil and groundwater; and (c) required toxicity information for use in a site-specific risk characterization for PFAS.”²⁸ In addition, the Department has set a Maximum Containment Level (“MCL”) for six PFAS in drinking water at 20 ppt.²⁹ One of these five PFAS – PFOA – appeared in PEER’s tests of Anvil and Permanone at concentrations that far exceed Massachusetts’ MCL, and require immediate action from the Department to protect the state’s waters and safeguard public health.

The Department of Agricultural Resources’ Authority to Regulate PFAS in Pesticides

Chapter 132B of the Massachusetts General Laws grants the Department of Agricultural Resources, in conjunction with the Pesticide Board and the Pesticide Board Subcommittee, broad authority to regulate pesticide distribution, use, and application within Massachusetts.³⁰ Under that authority, there are a range of actions that the Department, the Board, or the Subcommittee could take to protect the environment and residents of Massachusetts from exposure to PFAS-contaminated pesticides. Most significantly, the Pesticide Board Subcommittee has the authority to suspend the state registration for any pesticide that “may cause unreasonable adverse effects on the environment,” or which poses “an imminent hazard.”³¹

²⁴ *Entergy Nuclear Generation Co. v. Dep’t of Env’tl. Prot.*, 459 Mass. 319, 337 n.17 (Mass. 2011).

²⁵ Mass. Gen. Laws c. 21, § 27 (12).

²⁶ *Entergy Nuclear Generation Co.*, *supra* note 24 at 330.

²⁷ DEP has recognized the scientific evidence connecting elevated levels of certain PFAS with developmental effects in fetuses and infants, cancer risks, effects on the immune system, and other health effects. *See* Massachusetts Department of Environmental Protection, *Per- and Polyfluoroalkyl Substances (PFAS)*, <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#massachusetts-drinking-water-standard-and-health-information> (last visited April 21, 2021).

²⁸ Massachusetts Department of Environmental Protection, *Final PFAS-Related Revisions to the MCP (2019)*, <https://www.mass.gov/lists/final-pfas-related-revisions-to-the-mcp-2019>.

²⁹ 310 CMR § 22.07G.

³⁰ *See, e.g.*, Mass. Gen. Laws ch. 132B, §5 (explaining the powers of the Department).

³¹ Mass. Gen. Laws ch. 132B, § 7.

In addition, the Department has the authority to “establish such restrictions and prohibitions upon the . . . packages and containers of pesticides . . . as it deems necessary to protect health and the environment.”³² The Department could exercise that authority to address the issue of PFAS leaching from fluorinated containers. More broadly, the Department has the authority to issue “an order imposing restraints on or requiring such action, as it deems necessary” to prevent “a potential threat of unreasonable adverse effect on the environment.”³³

The Department would not be alone in exercising its authority over pesticides to protect people and the environment. For example, the New York Department of Environmental Conservation acted quickly after learning of the presence of PFAS in Anvil by “quarantine[ing] Anvil 10 + 10 products statewide” and “launching a comprehensive investigation into the universe and use of products stored in [fluorinated HDPE] containers.”³⁴

It is critical that the Department of Agricultural Resources act swiftly to protect residents and the environment. Waiting for EPA to address the issue puts residents and the environment at unnecessary risk. EPA has so far relied primarily on voluntary action by Clarke to recall Anvil shipped in fluorinated containers. According to EPA, Clarke has “voluntarily stopped shipment of any products in fluorinated HDPE containers and is conducting its own testing to confirm EPA results and product stability in un-fluorinated containers.”³⁵ EPA has “asked states with existing stock of [Anvil] distributed in fluorinated HDPE containers to discontinue use and hold until its final disposition is determined.”³⁶ EPA’s requests for voluntary action are insufficient to address the serious dangers posed by PFAS-contaminated pesticides. EPA’s actions do not apply to Mavrik, Permanone, or any other contaminated pesticide and do not apply to consumers, certified applicators, or others who may possess or apply PFAS-contaminated pesticides. The Department must act to protect residents and the environment.

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- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on

³² Mass. Gen. Laws ch. 132B, §11.

³³ Mass. Gen. Laws ch. 132B, §12.

³⁴ New York Department of Environmental Conservation, *Statement from New York State Department of Environmental Conservation Commissioner Basil Seggos on New Investigation of Potential PFAS Contamination* (January 15, 2021), <https://www.dec.ny.gov/press/122184.html>.

³⁵ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

³⁶ *Id.*

comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;

- (4) Coordinate with the Department of Public Health, and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

We appreciate your prompt attention to this urgent issue of public and environmental health and await your response.

Sincerely,



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May 17, 2021

By email

Commissioner Amanda Beal
Maine Department of Agriculture, Conservation and Forestry
22 State House Station
Augusta, ME 04333

Commissioner Melanie Loyzim
Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333

Director Megan Patterson
Maine Board of Pesticides Control
28 State House Station
Augusta, ME 04333

Re: Agency action needed to address PFAS contamination in pesticides

Dear Commissioner Beal, Commissioner Loyzim, and Director Patterson,

We write to raise the urgent issue of pesticides contaminated with per- and polyfluoroalkyl substances (“PFAS”), toxic “forever chemicals.” Recent tests conducted by the U.S. Environmental Protection Agency (“EPA”) and Public Employees for Environmental Responsibility (“PEER”) have shown alarmingly high concentrations of PFAS in pesticide products registered and used in Maine. This will only further complicate the issue of PFAS contamination of water supplies and soils that have already impacted communities and public health across the state, as you well know. We ask that your agencies take the following steps to protect Maine’s residents and environment from exposure to PFAS in pesticides:

- (1) Prohibit or suspend distribution and use of pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Maine for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on

comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;

- (4) Coordinate with the Department of Health and Human Services and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

Overview of PFAS & Health Effects

Per- and polyfluoroalkyl substances, known as PFAS, are human-made chemicals used in hundreds of products and industrial processes. PFAS are known as “forever chemicals” because they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion (“ppt”).¹ 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.² PFAS have been linked to increases in testicular and kidney cancer in human adults.³

Alarming, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,⁴ and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.⁵ The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a “Statement on Potential Intersection between PFAS Exposure and COVID-19,” which recognized the “evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance.”⁶

¹ U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls* (June 2018), at 5–6, <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.

² *Id.*

³ *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf>.

⁴ Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), <https://pubmed.ncbi.nlm.nih.gov/30470793/>.

⁵ See U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

⁶ Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last visited Mar. 29, 2021).

PFAS Contamination in Pesticides

In fall 2020, Public Employees for Environmental Responsibility (“PEER”) tested the insecticide Anvil 10 + 10 (“Anvil”) and discovered that it contains PFAS. Specifically, PEER’s tests found 250 ppt of perfluorooctanoic acid (“PFOA”), and 260 – 500 ppt of hexafluoropropylene oxide dimer acid (“HFPO-DA”), a “GenX” replacement for PFOA.⁷ PFOA was phased out of production starting in 2006 because of serious concerns over its harmful effects on human health and the environment.⁸ PEER notified the Massachusetts Department of Environmental Protection (“DEP”) and the U.S. Environmental Protection Agency (“EPA”). In December 2020, the *Boston Globe* reported on PEER’s findings, confirming that DEP had tested Anvil and found levels of multiple PFAS compounds that substantially exceed the state’s new limits on PFAS in drinking water.⁹

Anvil, manufactured by Clarke, is used widely for mosquito control. At least twenty-six states – including Maine – have used or purchased Anvil for mosquito control in recent years.¹⁰ Clarke stores and ships Anvil and some of its other pesticides in a type of plastic container called high density polyethylene (“HDPE”). Clarke’s HDPE containers are fluorinated in order to make them less permeable and reactive.¹¹ EPA testing revealed that the fluorinated containers used to store Anvil contain eight different PFAS compounds – including one type of PFAS, PFOA, for which EPA has issued a health advisory¹² – at levels ranging from 20,000-50,000 parts per trillion.¹³

EPA’s theory is that the PFAS are likely leaching from the fluorinated containers into the pesticide stored inside.¹⁴ If the fluorinated containers are the source of the PFAS in Anvil, this problem likely extends well beyond pesticides produced by Clarke. This could be a problem for

⁷ Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

⁸ See U.S. Environmental Protection Agency, *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what> (last visited Mar. 29, 2021).

⁹ David Abel, *Toxic “Forever Chemicals” Found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes*, BOSTON GLOBE, December 1, 2020, <https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/>.

¹⁰ See U.S. Environmental Protection Agency, *EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021) https://www1.maine.gov/dacf/php/pesticides/documents2/bd_mtgs/mar21/6o-EPA-PFAS-files-combined.pdf (listing states, including Maine, that purchased Anvil from Clarke between 2018 and 2020).

¹¹ U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021).

¹² See U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021) (listing PFAS found in Anvil packaging); U.S. Environmental Protection Agency, *Drinking Water Health Advisories for PFOA and PFOS*, <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos> (last visited May 4, 2021) (explaining lifetime health advisory for PFOA and PFOS at 70 ppt).

¹³ U.S. Environmental Protection Agency, *Memorandum, EPA’s Analytical Chemistry Branch PFAS Testing: Rinses from Selected Fluorinated and Non-Fluorinated HDPE Containers*, 3 (March 4, 2021), https://www.epa.gov/sites/production/files/2021-03/documents/results-of-rinsates-samples_03042021.pdf.

¹⁴ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination*, (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

hundreds or even thousands of pesticide products, as fluorination is a common treatment for pesticide packaging.¹⁵

Additional testing conducted by PEER has revealed PFAS contamination in the mosquito and tick control pesticide Mavrik Perimeter (“Mavrik”), manufactured by Zoecon, and the mosquito control pesticide Permanone 30–30 (“Permanone”), manufactured by Bayer Environmental Science.¹⁶ Both Mavrik and Permanone are registered for use in Maine. PEER’s testing found PFAS present in Mavrik at a total concentration of 280 ppt.¹⁷ In Permanone, PEER found 3,500 ppt of PFOA and 630 ppt of HFPO-DA.¹⁸ For reference, EPA’s health advisory level for PFOA is only 70 ppt.¹⁹ EPA has not yet taken action on the discovery of PFAS in Mavrik, Permanone, and other pesticides. Clearly, these results strongly suggest that PFAS contamination of pesticides is a widespread issue, affecting an unknown number of pesticide products. In addition to Anvil, Mavrik, and Permanone, PEER has discovered PFAS contamination in at least three other pesticides, which PEER will identify once it has completed final tests to confirm the PFAS contamination levels in those pesticides.

PEER’s recent findings also suggest that leaching from fluorinated containers is not the only source of PFAS contamination in pesticides. First, the Permanone PEER tested is sold in metal barrels, not the fluorinated HDPE barrels that Anvil is stored in.²⁰ Second, both the high levels of PFAS found in PEER’s most recent tests and the fact that the tests found different PFAS in many of the pesticides suggest that there is at least one other source of contamination in addition to fluorination of pesticide packaging. Possible sources include PFAS applied to the equipment used to manufacture or package the pesticides or PFAS that are intentionally added as “inert” ingredients to the pesticide products.

PFAS may be added to pesticides as inert ingredients without the public’s knowledge. Most pesticide manufacturers do not disclose the inert ingredients in their pesticide products. Inert

¹⁵ See, e.g., Office of the Indiana State Chemist and Seed Commissioner, Press Release, January 20, 2021, https://www.oisc.purdue.edu/pesticide/pdf/pfas_in_pesticide_statement_012021.pdf (“According [to] the EPA, ‘it is estimated that roughly 20-30% of all rigid agriculture chemical packaging in North America sold into the crop protection market are packaged in fluorinated HDPE containers.’”); Jeremy C. Fox, *EPA Finds Toxic Compounds in Mosquito Spray Used in Mass.; Maker Will Change Packaging*, BOSTON GLOBE, January 14, 2021, <https://www.bostonglobe.com/2021/01/15/metro/epa-finds-toxic-compounds-mosquito-spray-used-mass-maker-will-change-packaging/> (“‘Fluorinated packaging is widely used by the agricultural industry for finished goods, including pesticides,’ [Clarke] said. ‘The potential for PFAS chemistry from the fluorinated packaging to leach into finished goods was unknown to Clarke.’”).

¹⁶ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, <https://www.eenews.net/stories/1063728605>.

¹⁷ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>.

¹⁸ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*.

¹⁹ U.S. Environmental Protection Agency, *Drinking Water Health Advisories for PFOA and PFOS*, <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos> (last visited May 4, 2021).

²⁰ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*. It is possible that Permanone is stored in HDPE barrels at some point in the manufacturing or distribution process, but the fact that PFAS exists in the Permanone delivered in metal barrels raises doubts that leaching from HDPE barrels fully explains the PFAS contamination PEER discovered.

ingredients must be approved by EPA, but they are not publicly disclosed if manufacturers claim them as trade secrets under federal pesticide law.²¹ EPA has approved a number of PFAS as permissible inert ingredients,²² but generally only EPA and the manufacturers know which pesticides contain PFAS.

The Department of Environmental Protection’s Authority to Regulate PFAS in the Environment

The Maine Department of Environmental Protection (“DEP”) has legal authority to protect residents and the environment from PFAS-contaminated pesticides. DEP has the broad authority to “prevent, abate and control the pollution of the air, water and land and preserve, improve and prevent diminution of the natural environment of the State.”²³ DEP already tests for the presence of PFAS in certain public water systems; certain groundwater, surface water, and private water supplies; and fish tissue.²⁴ Testing for PFAS in areas where contaminated pesticides have been applied would be in line with DEP’s ongoing investigations of PFAS contamination in Maine’s environment.

Governor Mills has prioritized a “coordinated response” by state agencies, including DEP, to “study PFAS distribution, assess the potential environmental and health impacts of PFAS, and recommend effective strategies to reduce or eliminate . . . those impacts.”²⁵ As part of that coordinated effort, DEP participated in the Maine PFAS Task Force. In its final report, the Task Force recommended “[i]dentifying and reducing uses of PFAS,” “[i]dentifying and investigating PFAS contaminants in the environment,” and “[p]roviding safe drinking water.”²⁶ Specifically, the Task Force recommend accelerating “ongoing efforts to identify prioritized locations and to sample groundwater, surface water and soil for PFAS, analyze sampling results for patterns, and refine models of PFAS fate and transport.”²⁷

Consistent with those recommendations, state lawmakers have introduced three bills addressing PFAS contamination in the environment. LD 129, as amended, directs the Commissioner of Health and Human Services to adopt rules setting a maximum contaminant level of 20 parts per trillion for six types of PFAS in Maine’s drinking water.²⁸ Recently, the Committee on Health and Human Services voted unanimously to advance LD 129 out of committee with amendments. A second bill, LD 1600 directs DEP to test certain areas of soil and groundwater for PFAS contamination.²⁹ And a third bill, LD 1503, would establish a comprehensive program

²¹ See 7. U.S.C. § 136h (permitting applicants for federal pesticide registration to declare certain information about the pesticide, including the identity of inert ingredients, as non-disclosable trade secrets).

²² See Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

²³ Me. Rev. Stat. tit. 38, § 341-A; see also Exec. Order No. 5 FY 19/20 (March 6, 2019) (recognizing that Maine law charges state agencies, including DEP, with “protecting public health and the environment from the risks of human exposure to these substances”).

²⁴ See Maine PFAS Task Force, *Managing PFAS in Maine* (January 2020), 7, <https://www.maine.gov/pfastaskforce/materials/report/PFAS-Task-Force-Report-FINAL-Jan2020.pdf>.

²⁵ Exec. Order No. 5 FY 19/20 (March 6, 2019).

²⁶ Maine PFAS Task Force, *supra* note 24 at 2.

²⁷ *Id.*, 22.

²⁸ LD 129, 130th Me. Leg., 1st Reg. Sess. (2021).

²⁹ LD 1600, 130th Me. Leg., 1st Spec. Sess. (2021).

administered by DEP for identifying and prohibiting the sale of most products, including pesticides, that contain intentionally added PFAS.³⁰ Given the legislature’s concern over PFAS contamination in Maine’s water, soil, and products, DEP should act now to investigate the extent to which PFAS-contaminated pesticides are exacerbating this issue of pressing public health concern.

The high levels of PFAS found in the pesticides sampled emphasize the need for immediate action. EPA has established a health advisory at 70 ppt for two PFAS: PFOA and PFOS.³¹ PEER’s tests of Anvil and Permanone discovered PFOA at concentrations of 250 and 3,500 ppt, respectively. These concentrations far exceed EPA’s health advisory level and underline the need for action to protect Maine’s waters and safeguard public health.

The Authority of the Board of Pesticides Control and the Department of Agriculture, Conservation and Forestry to Regulate PFAS in Pesticides

Maine law grants the Board of Pesticides Control (“the Board”), in cooperation with the Department of Agriculture, Conservation and Forestry (“DACF”), broad authority to regulate pesticide distribution, use, and application within the state.³² Under that authority, there are a range of actions that the Board and DACF could take to protect the environment and residents from exposure to PFAS-contaminated pesticides. Most significantly, the Board has the authority to cancel or suspend the state registration for any pesticide that “might cause unreasonable adverse effects on the environment,” or which poses “an imminent hazard.”³³

In addition, the Board has the authority to adopt rules “that it determines necessary to carry out the provisions of [the Maine Pesticide Control Act],” including “[p]roviding for the collection, examination and reporting of samples of pesticides or devices” and “[p]roviding for the safe handling, transportation, storage, display, distribution and disposal of pesticides and their containers.”³⁴ The Board could exercise that authority to coordinate a program to test pesticides for PFAS contamination and to address the issue of PFAS leaching from fluorinated containers. The Board also has the authority to issue “stop sale, use or removal” orders to enforce Maine’s pesticide laws and protect Maine’s residents and environment.³⁵

The Board and DACF would not be alone in exercising their authority over pesticides to protect people and the environment. For example, the New York Department of Environmental Conservation acted quickly after learning of the presence of PFAS in Anvil by “quarantine[ing]

³⁰ LD 1503, 130th Me. Leg., 1st Spec. Sess. (2021).

³¹ U.S. Environmental Protection Agency, *Drinking Water Health Advisories for PFOA and PFOS*, <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos> (last visited May 4, 2021).

³² *See, e.g.*, Me. Rev. Stat. tit. 22, § 1471-O (“The powers established under the Maine Pesticide Control Act of 1975 . . . shall be exercised by the Board of Pesticides Control.”); Me. Rev. Stat. tit. 22, § 1471-B (“The Commissioner of Agriculture, Conservation and Forestry shall provide the board with administrative services of the department, including assistance in the preparation of the board's budget.”).

³³ Me. Rev. Stat. tit. 7, § 609.

³⁴ Me. Rev. Stat. tit. 7, § 610.

³⁵ Me. Rev. Stat. tit. 7, § 612.

Anvil 10 + 10 products statewide” and “launching a comprehensive investigation into the universe and use of products stored in [fluorinated HDPE] containers.”³⁶

It is critical that the Board and DACF act swiftly to protect residents and the environment. Waiting for EPA to address the issue puts residents and the environment at unnecessary risk. EPA has so far relied primarily on voluntary action by Clarke to recall Anvil shipped in fluorinated containers. According to EPA, Clarke has “voluntarily stopped shipment of any products in fluorinated HDPE containers and is conducting its own testing to confirm EPA results and product stability in un-fluorinated containers.”³⁷ EPA has “asked states with existing stock of [Anvil] distributed in fluorinated HDPE containers to discontinue use and hold until its final disposition is determined.”³⁸ EPA’s requests for voluntary action are insufficient to address the serious dangers posed by PFAS-contaminated pesticides. EPA’s actions do not apply to Mavrik, Permanone, or any other contaminated pesticide and do not apply to consumers, certified applicators, or others who may possess or apply PFAS-contaminated pesticides. The Board and DACF must act to protect residents and the environment.

CLF and PEER’s Requests

Given the dangers PFAS pose to Maine’s residents and environment and the growing evidence of widespread PFAS contamination in pesticides, CLF and PEER reiterate our request that your agencies take the following actions:

- (1) Prohibit or suspend distribution and use of Anvil, Mavrik, Permanone, and any other pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Maine for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and Human Services and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

³⁶ New York Department of Environmental Conservation, *Statement from New York State Department of Environmental Conservation Commissioner Basil Seggos on New Investigation of Potential PFAS Contamination* (January 15, 2021), <https://www.dec.ny.gov/press/122184.html>.

³⁷ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

³⁸ *Id.*

We appreciate your prompt attention to this urgent issue of public and environmental health and await your response.

Sincerely,



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May 17, 2021

By email

Commissioner Shawn Jasper
New Hampshire Department of Agriculture, Markets & Food
25 Capitol Street
Concord, NH 03301

Commissioner Robert Scott
New Hampshire Department of Environmental Services
29 Hazen Drive
Concord, NH 03301

Re: Agency action needed to address PFAS contamination in pesticides

Dear Commissioner Jasper and Commissioner Scott,

We write to alert you to the urgent issue of pesticides contaminated with per- and polyfluoroalkyl substances (“PFAS”), toxic “forever chemicals.” Recent tests conducted by the U.S. Environmental Protection Agency (“EPA”) and Public Employees for Environmental Responsibility (“PEER”) have shown alarmingly high concentrations of PFAS in pesticide products registered and used in New Hampshire. We ask that your departments take the following steps to protect New Hampshire’s residents and environment from exposure to PFAS:

- (1) Prohibit or suspend distribution and use of pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in New Hampshire for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and Human Services and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

Overview of PFAS & Health Effects

Per- and polyfluoroalkyl substances, known as PFAS, are human-made chemicals used in hundreds of products and industrial processes. PFAS are known as “forever chemicals” because they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion (“ppt”).¹ 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.² PFAS have been linked to increases in testicular and kidney cancer in human adults.³

Alarming, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,⁴ and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.⁵ The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a “Statement on Potential Intersection between PFAS Exposure and COVID-19,” which recognized the “evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance.”⁶

PFAS Contamination in Pesticides

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¹ U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls* (June 2018), at 5–6, <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.

² *Id.*

³ *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf>.

⁴ Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), <https://pubmed.ncbi.nlm.nih.gov/30470793/>.

⁵ See U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

⁶ Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last visited Mar. 29, 2021).

⁷ Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

and the environment.⁸ PEER notified the Massachusetts Department of Environmental Protection (“DEP”) and the U.S. Environmental Protection Agency (“EPA”). In December 2020, the *Boston Globe* reported on PEER’s findings, confirming that DEP had tested Anvil and found levels of some PFAS compounds that substantially exceed the state’s new limits on PFAS in drinking water.⁹

Anvil, manufactured by Clarke, is used widely for mosquito control. At least twenty-six states – including New Hampshire – have used Anvil for mosquito control in recent years.¹⁰ Clarke stores and ships Anvil and some of its other pesticides in a type of plastic container called high density polyethylene (“HDPE”). Clarke’s HDPE containers are fluorinated in order to make them less permeable and reactive.¹¹ EPA testing revealed that the fluorinated containers used to store Anvil contain eight different PFAS compounds – including two PFAS compounds listed in New Hampshire’s drinking water standards¹² – at levels ranging from 20-50 parts per billion.¹³

EPA’s theory is that the PFAS are likely leaching from the fluorinated containers into the pesticide stored inside.¹⁴ If the fluorinated containers are the source of the PFAS in Anvil, this problem likely extends well beyond pesticides produced by Clarke. This could be a problem for hundreds or even thousands of pesticide products, as fluorination is a common treatment for pesticide packaging.¹⁵

Additional testing conducted by PEER has revealed PFAS contamination in the mosquito and

⁸ See U.S. Environmental Protection Agency, *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what> (last visited Mar. 29, 2021).

⁹ David Abel, *Toxic “Forever Chemicals” Found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes*, BOSTON GLOBE, December 1, 2020, <https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/>.

¹⁰ See U.S. Environmental Protection Agency, *EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021) https://www1.maine.gov/dacf/php/pesticides/documents2/bd_mtgs/mar21/6o-EPA-PFAS-files-combined.pdf (listing states, including New Hampshire, that purchased Anvil from Clarke between 2018 and 2020).

¹¹ U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021).

¹² Those two PFAS substances are PFOA and PFNA. See U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021) (listing PFAS found in Anvil packaging); N.H. Rev. Stat. Ann. § 485:16-e (listing PFAS compounds regulated under New Hampshire’s drinking water standards).

¹³ U.S. Environmental Protection Agency, *Memorandum, EPA’s Analytical Chemistry Branch PFAS Testing: Rinses from Selected Fluorinated and Non-Fluorinated HDPE Containers*, 3 (March 4, 2021), https://www.epa.gov/sites/production/files/2021-03/documents/results-of-rinsates-samples_03042021.pdf.

¹⁴ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination*, (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

¹⁵ See, e.g., Office of the Indiana State Chemist and Seed Commissioner, *Press Release*, January 20, 2021, https://www.oisc.purdue.edu/pesticide/pdf/pfas_in_pesticide_statement_012021.pdf (“According [to] the EPA, ‘it is estimated that roughly 20-30% of all rigid agriculture chemical packaging in North America sold into the crop protection market are packaged in fluorinated HDPE containers.’”); Jeremy C. Fox, *EPA Finds Toxic Compounds in Mosquito Spray Used in Mass.; Maker Will Change Packaging*, BOSTON GLOBE, January 14, 2021, <https://www.bostonglobe.com/2021/01/15/metro/epa-finds-toxic-compounds-mosquito-spray-used-mass-maker-will-change-packaging/> (“Fluorinated packaging is widely used by the agricultural industry for finished goods, including pesticides,” [Clarke] said. “The potential for PFAS chemistry from the fluorinated packaging to leach into finished goods was unknown to Clarke.”).

tick control pesticide Mavrik Perimeter (“Mavrik”), manufactured by Zoecon, and the mosquito control pesticide Permanone 30–30 (“Permanone”), manufactured by Bayer Environmental Science.¹⁶ Both Mavrik and Permanone are registered for use in New Hampshire. PEER’s testing found PFAS present in Mavrik at a total concentration of 280 ppt.¹⁷ In Permanone, PEER found 3,500 ppt of PFOA and 630 ppt of HFPO-DA.¹⁸ For reference, New Hampshire’s drinking water standards set the maximum contaminant level of PFOA at 12 ppt.¹⁹ EPA has not yet taken action on the discovery of PFAS in Mavrik, Permanone, and other pesticides. Clearly, these results strongly suggest that PFAS contamination of pesticides is a widespread issue, affecting an unknown number of pesticide products. In addition to Anvil, Mavrik, and Permanone, PEER has discovered PFAS contamination in at least three other pesticides, which PEER will identify once it has completed final tests to confirm the PFAS contamination levels in those pesticides.

PEER’s recent findings also suggest that leaching from fluorinated containers is not the only source of PFAS contamination in pesticides. First, the Permanone PEER tested is sold in metal barrels, not the fluorinated HDPE barrels that Anvil is stored in.²⁰ Second, both the high levels of PFAS found in PEER’s most recent tests and the fact that the tests found different PFAS in many of the pesticides suggest that there is at least one other source of contamination in addition to fluorination of pesticide packaging. Possible sources include PFAS applied to the equipment used to manufacture or package the pesticides or PFAS that are intentionally added as “inert” ingredients to the pesticide products.

PFAS may be added to pesticides as inert ingredients without the public’s knowledge. Most pesticide manufacturers do not disclose the inert ingredients in their pesticide products. Inert ingredients must be approved by EPA, but they are not publicly disclosed if manufacturers claim them as trade secrets under federal pesticide law.²¹ EPA has approved a number of PFAS as permissible inert ingredients,²² but generally only EPA and the manufacturers know which pesticides contain PFAS.

¹⁶ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, <https://www.eenews.net/stories/1063728605>.

¹⁷ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: “A Problem of Epic Proportions”*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>.

¹⁸ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*.

¹⁹ N.H. Rev. Stat. Ann. § 485:16-e.

²⁰ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*.

²¹ See 7. U.S.C. § 136h (permitting applicants for federal pesticide registration to declare certain information about the pesticide, including the identity of inert ingredients, as non-disclosable trade secrets).

²² See Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>. It is possible that Permanone is stored in HDPE barrels at some point in the manufacturing or distribution process, but the fact that PFAS exists in the Permanone delivered in metal barrels raises doubts that leaching from HDPE barrels fully explains the PFAS contamination PEER discovered.

The Department of Environmental Services' Authority to Regulate PFAS in New Hampshire's Environment

The Department of Environmental Services (“DES”) has legal authority to protect residents and the environment from PFAS-contaminated pesticides by monitoring for PFAS in the environment and requiring compliance with state regulatory standards. Under the New Hampshire Safe Drinking Water Act, DES is responsible for “implement[ing] a comprehensive drinking water protection program,” including “[m]onitor[ing] the water quality of public water supplies and privately owned redistribution systems . . . [and] [p]eriodically conduct[ing] sanitary surveys of public water systems and privately owned redistribution systems to make certain of proper safety and operation.”²³ Likewise, under the state’s Ground Water Protection Act, DES is tasked with “protect[ing] the natural quality of the groundwater resource of the state by assisting local groundwater protection efforts and by establishing procedures and standards for the classification and remediation of groundwater.”²⁴ To fulfill that mandate, DES is authorized to “[p]rovide for the investigation, management, and remediation of contaminated groundwater.”²⁵

Commissioner Scott has recognized PFAS contamination in New Hampshire’s environment as “one of the greatest and far-reaching environmental challenges facing the granite state.”²⁶ The legislature shares Commissioner Scott’s concern, and in 2020 passed a law establishing maximum contaminant levels (MCLs) for four types of PFAS found in drinking water.²⁷ One of these four PFAS – PFOA – appeared in PEER’s tests of Anvil and Permanone at concentrations of 250 and 3,500 ppt, respectively. These levels of PFOA are orders of magnitude higher than New Hampshire’s MCL of 12 ppt for PFOA and underline the need for immediate action to protect the state’s waters and safeguard public health.

Action by DES on the issue of PFAS in pesticides would be consistent with New Hampshire’s larger efforts to investigate the sources of PFAS contamination in the environment and to hold manufacturers and polluters accountable. The state has brought a landmark lawsuit against PFAS manufacturers and distributors seeking compensation for widespread damage to New Hampshire’s environment and the costs associated with removing PFAS from the environment.²⁸ The recent discovery of PFAS in Anvil, Mavrik, Permanone, and other pesticides indicates an additional source of PFAS contamination in New Hampshire’s environment, which DES should investigate in support of the state’s efforts to hold polluters accountable.

²³ N.H. Rev. Stat. Ann. § 485:1.

²⁴ N.H. Rev. Stat. Ann. § 485-C:1

²⁵ N.H. Rev. Stat. Ann. § 485-C:3.

²⁶ Office of the Governor, *Press Release: State of New Hampshire Announces Historic Lawsuit, Actions to Protect Clean Drinking Water in New Hampshire* (May 29, 2019), <https://www.governor.nh.gov/news-and-media/state-new-hampshire-announces-historic-lawsuit-actions-protect-clean-drinking-water>.

²⁷ See N.H. Rev. Stat. Ann. § 485:16-e.

²⁸ See Office of the Governor, *supra* note 26.

The Department of Agriculture, Markets & Food’s Authority to Regulate PFAS in Pesticides

New Hampshire law grants the Department of Agriculture, Markets & Food (“DAMF”), through the Division of Pesticide Control, and in conjunction with the Pesticide Control Board, broad authority to regulate pesticide distribution, use, and application within the state. Under that authority, there are a range of actions that DAMF could take to protect the environment and residents from exposure to PFAS-contaminated pesticides. Most significantly, the Division of Pesticide Control has the authority to cancel the state registration for any pesticide that “would cause unreasonable adverse effects on the environment.”²⁹ The Division of Pesticide Control is “authorized to examine any pesticide for the purpose of determining whether it complies with the registration requirements set forth [in New Hampshire law.]”³⁰ Additionally, the Division of Pesticide Control may “issue written ‘stop sale, use or removal’ orders upon the owner or custodian of any pesticide or device”³¹ when such pesticide or device is in violation of any provision of state pesticide law or regulations, and the Division may seize pesticides that are adulterated or misbranded.³²

DAMF would not be alone in exercising its authority over pesticides to protect people and the environment. For example, the New York Department of Environmental Conservation acted quickly after learning of the presence of PFAS in Anvil by “quarantine[ing] Anvil 10 + 10 products statewide” and “launching a comprehensive investigation into the universe and use of products stored in [fluorinated HDPE] containers.”³³

It is critical that DAMF act swiftly to protect residents and the environment. Waiting for EPA to address the issue puts residents and the environment at unnecessary risk. EPA has so far relied primarily on voluntary action by Clarke to recall Anvil shipped in fluorinated containers. According to EPA, Clarke has “voluntarily stopped shipment of any products in fluorinated HDPE containers and is conducting its own testing to confirm EPA results and product stability in un-fluorinated containers.”³⁴ EPA has “asked states with existing stock of [Anvil] distributed in fluorinated HDPE containers to discontinue use and hold until its final disposition is determined.”³⁵ EPA’s requests for voluntary action are insufficient to address the serious dangers posed by PFAS-contaminated pesticides. EPA’s actions do not apply to Mavrik, Permanone, or any other contaminated pesticide and do not apply to consumers, certified applicators, or others who may possess or apply PFAS-contaminated pesticides. DAMF must act to protect residents and the environment.

²⁹ N.H. Rev. Stat. Ann. § 430:38, VII.

³⁰ N.H. Rev. Stat. Ann. § 430:42, III.

³¹ N.H. Rev. Stat. Ann. § 430:42, V.

³² N.H. Rev. Stat. Ann. § 430:42, VI.

³³ New York Department of Environmental Conservation, *Statement from New York State Department of Environmental Conservation Commissioner Basil Seggos on New Investigation of Potential PFAS Contamination* (January 15, 2021), <https://www.dec.ny.gov/press/122184.html>.

³⁴ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

³⁵ *Id.*

CLF and PEER's Requests

Given the dangers PFAS pose to New Hampshire's residents and environment and the growing evidence of widespread PFAS contamination in pesticides, CLF and PEER reiterate our request that your Departments take the following actions:

- (1) Prohibit or suspend distribution and use of Anvil, Mavrik, Permanone, and any other pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in New Hampshire for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and Human Services and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

We appreciate your prompt attention to this urgent issue of public and environmental health and await your response.

Sincerely,



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May 17, 2021

By email

Director Janet Coit
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908

Re: Agency action needed to address PFAS contamination in pesticides

Dear Director Coit,

We write to alert you to the urgent issue of pesticides contaminated with per- and polyfluoroalkyl substances (“PFAS”), toxic “forever chemicals.” Recent tests conducted by the U.S. Environmental Protection Agency (“EPA”) and Public Employees for Environmental Responsibility (“PEER”) have shown alarmingly high concentrations of PFAS in pesticide products registered and used in Rhode Island. We ask that the Department of Environmental Management take the following steps to protect Rhode Island’s residents and environment from exposure to PFAS:

- (1) Prohibit or suspend distribution and use of pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Rhode Island for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Convene a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

Overview of PFAS & Health Effects

Per- and polyfluoroalkyl substances, known as PFAS, are human-made chemicals used in hundreds of products and industrial processes. PFAS are known as “forever chemicals” because

they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion (“ppt”).¹ 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.² PFAS have been linked to increases in testicular and kidney cancer in human adults.³

Alarming, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,⁴ and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative colitis.⁵ The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a “Statement on Potential Intersection between PFAS Exposure and COVID-19,” which recognized the “evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance.”⁶

PFAS Contamination in Pesticides

In fall 2020, Public Employees for Environmental Responsibility (“PEER”) tested the insecticide Anvil 10 + 10 (“Anvil”) and discovered that it contains PFAS. Specifically, PEER’s tests found 250 ppt of perfluorooctanoic acid (“PFOA”), and 260 – 500 ppt of hexafluoropropylene oxide dimer acid (“HFPO-DA”), a “GenX” replacement for PFOA.⁷ PFOA was phased out of production starting in 2006 because of serious concerns over its harmful effects on human health and the environment.⁸ PEER notified the Massachusetts Department of Environmental Protection (“DEP”) and the U.S. Environmental Protection Agency (“EPA”). In December 2020, the *Boston Globe* reported on PEER’s findings, confirming that DEP had tested Anvil and found levels of

¹ U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls* (June 2018), at 5–6, <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.

² *Id.*

³ *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf>.

⁴ Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), <https://pubmed.ncbi.nlm.nih.gov/30470793/>.

⁵ See U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

⁶ Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last visited Mar. 29, 2021).

⁷ Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>.

⁸ See U.S. Environmental Protection Agency, *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what> (last visited Mar. 29, 2021).

some PFAS compounds that substantially exceed the state’s new limits on PFAS in drinking water.⁹

Anvil, manufactured by Clarke, is used widely for mosquito control. At least twenty-six states – including Rhode Island – have used or purchased Anvil for mosquito control in recent years.¹⁰ Clarke stores and ships Anvil and some of its other pesticides in a type of plastic container called high density polyethylene (“HDPE”). Clarke’s HDPE containers are fluorinated in order to make them less permeable and reactive.¹¹ EPA testing revealed that the fluorinated containers used to store Anvil contain eight different PFAS compounds – including one PFAS compound, PFOA, listed in Rhode Island’s ground water quality standards¹² – at levels ranging from 20-50 parts per billion.¹³

EPA’s theory is that the PFAS are likely leaching from the fluorinated containers into the pesticide stored inside.¹⁴ If the fluorinated containers are the source of the PFAS in Anvil, this problem likely extends well beyond pesticides produced by Clarke. This could be a problem for hundreds or even thousands of pesticide products, as fluorination is a common treatment for pesticide packaging.¹⁵

Additional testing conducted by PEER has revealed PFAS contamination in the mosquito and tick control pesticide Mavrik Perimeter (“Mavrik”), manufactured by Zoecon, and the mosquito control pesticide Permanone 30–30 (“Permanone”), manufactured by Bayer Environmental

⁹ David Abel, *Toxic “Forever Chemicals” Found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes*, BOSTON GLOBE, December 1, 2020, <https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/>.

¹⁰ Public Employees for Environmental Responsibility, *Internet Search of State Use of Anvil 10 +10 in the United States* (November 23, 2020), <https://www.peer.org/wp-content/uploads/2020/11/State-use-of-Anvil-1010-updated-11.9.20.pdf?eType=EmailBlastContent&eId=1c783f1a-fbb9-4fe2-b9b5-a694dc19b99e>; see also U.S. Environmental Protection Agency, *EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021) https://www1.maine.gov/dacf/php/pesticides/documents2/bd_mtgs/mar21/6o-EPA-PFAS-files-combined.pdf (listing states, including Rhode Island, that purchased Anvil from Clarke between 2018 and 2020).

¹¹ U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021).

¹² See U.S. Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS) in Pesticide Packaging*, <https://www.epa.gov/pesticides/pfas-packaging> (last visited Mar. 29, 2021) (listing PFAS found in Anvil packaging); 250 R.I. Code R. § 150-05-3.11 (establishing ground water quality standard for PFOA).

¹³ U.S. Environmental Protection Agency, *Memorandum, EPA’s Analytical Chemistry Branch PFAS Testing: Rinses from Selected Fluorinated and Non-Fluorinated HDPE Containers*, 3 (March 4, 2021), https://www.epa.gov/sites/production/files/2021-03/documents/results-of-rinsates-samples_03042021.pdf.

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¹⁵ See, e.g., Office of the Indiana State Chemist and Seed Commissioner, *Press Release*, January 20, 2021, https://www.oisc.purdue.edu/pesticide/pdf/pfas_in_pesticide_statement_012021.pdf (“According [to] the EPA, ‘it is estimated that roughly 20-30% of all rigid agriculture chemical packaging in North America sold into the crop protection market are packaged in fluorinated HDPE containers.’”); Jeremy C. Fox, *EPA Finds Toxic Compounds in Mosquito Spray Used in Mass.; Maker Will Change Packaging*, BOSTON GLOBE, January 14, 2021, <https://www.bostonglobe.com/2021/01/15/metro/epa-finds-toxic-compounds-mosquito-spray-used-mass-maker-will-change-packaging/> (“Fluorinated packaging is widely used by the agricultural industry for finished goods, including pesticides,” [Clarke] said. “The potential for PFAS chemistry from the fluorinated packaging to leach into finished goods was unknown to Clarke.”).

Science.¹⁶ Both Mavrik and Permanone are registered for use in Rhode Island. PEER's testing found PFAS present in Mavrik at a total concentration of 280 ppt.¹⁷ In Permanone, PEER found 3,500 ppt of PFOA and 630 ppt of HFPO-DA.¹⁸ For reference, Rhode Island's ground water quality standards set the maximum contaminant level of PFOA at 70 ppt.¹⁹ EPA has not yet taken action on the discovery of PFAS in Mavrik, Permanone, and other pesticides. Clearly, these results strongly suggest that PFAS contamination of pesticides is a widespread issue, affecting an unknown number of pesticide products. In addition to Anvil, Mavrik, and Permanone, PEER has discovered PFAS contamination in at least three other pesticides, which PEER will identify once it has completed final tests to confirm the PFAS contamination levels in those pesticides.

PEER's recent findings also suggest that leaching from fluorinated containers is not the only source of PFAS contamination in pesticides. First, the Permanone PEER tested is sold in metal barrels, not the fluorinated HDPE barrels that Anvil is stored in.²⁰ Second, both the high levels of PFAS found in PEER's most recent tests and the fact that the tests found different PFAS in many of the pesticides suggest that there is at least one other source of contamination in addition to fluorination of pesticide packaging. Possible sources include PFAS applied to the equipment used to manufacture or package the pesticides or PFAS that are intentionally added as "inert" ingredients to the pesticide products.

PFAS may be added to pesticides as inert ingredients without the public's knowledge. Most pesticide manufacturers do not disclose the inert ingredients in their pesticide products. Inert ingredients must be approved by EPA, but they are not publicly disclosed if manufacturers claim them as trade secrets under federal pesticide law.²¹ EPA has approved a number of PFAS as permissible inert ingredients,²² but generally only EPA and the manufacturers know which pesticides contain PFAS.

¹⁶ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: "A Problem of Epic Proportions"*, E&E NEWS, March 5, 2021, <https://www.eenews.net/stories/1063726787>; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, <https://www.eenews.net/stories/1063728605>.

¹⁷ E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: "A Problem of Epic Proportions"*, *supra* note 16.

¹⁸ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, *supra* note 16.

¹⁹ Rhode Island Department of Environmental Management, *Rhode Island Department of Environmental Management Determination of a Groundwater Quality Standard for: Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS)* (October 18, 2017), <http://www.dem.ri.gov/programs/benviron/water/quality/pdf/pfoa.pdf>.

²⁰ E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*.

²¹ See 7. U.S.C. § 136h (permitting applicants for federal pesticide registration to declare certain information about the pesticide, including the identity of inert ingredients, as non-disclosable trade secrets).

²² See Public Employees for Environmental Responsibility, *Press Release: Aerially Sprayed Pesticide Contains PFAS* (December 1, 2020), <https://www.peer.org/aerially-sprayed-pesticide-contains-pfas/>. It is possible that Permanone is stored in HDPE barrels at some point in the manufacturing or distribution process, but the fact that PFAS exists in the Permanone delivered in metal barrels raises doubts that leaching from HDPE barrels fully explains the PFAS contamination PEER discovered.

The Department’s Authority to Regulate PFAS in the Environment

The Rhode Island Department of Environmental Management (“the Department”) has legal authority to protect residents and the environment from PFAS-contaminated pesticides by monitoring for PFAS in the environment and requiring compliance with state water quality standards. The Department’s mandate includes supporting healthy aquatic life, maintaining drinking water quality, and protecting ground water from contamination.²³ In carrying out that mandate, it is the responsibility of the director of the Department to “develop comprehensive programs for the prevention, control, and abatement of new or existing pollution of the waters of this state;” to “encourage, participate in, or conduct studies, investigations, research, and demonstrations relating to water pollution and its causes, prevention, control, and abatement thereof;” to “collect and disseminate information relating to water pollution and the prevention, control, and abatement thereof;” and to “advise, consult, and cooperate with other agencies of the state, the federal government, other states, and interstate agencies and with affected groups, political subdivisions, and industries in the furtherance of [the Department’s duty to protect Rhode Island’s waters.]”²⁴ The director also may exercise emergency powers to “take such action as the director deems necessary to protect the public health or safety or the environment” whenever the director receives “evidence that a pollution source or combination of sources is presenting an imminent and substantial endangerment to the health of persons or to the welfare of persons where that endangerment is, to the livelihood of those persons, or to . . . the environment.”²⁵

According to the Department’s regulations, the Department is tasked with the responsibility to “protect and restore the quality of the state’s groundwater resources for use as drinking water and other beneficial uses, and to assure protection of the public health and welfare and the environment.”²⁶ In fulfilling that responsibility, the Department has so far established a groundwater quality standard for two PFAS – PFAO and PFOS – at 70 ppt.²⁷ PFOA appeared in PEER’s tests of Anvil and Permanone at concentrations of 250 and 3,500 ppt, respectively. These concentrations far exceed Rhode Island’s ground water quality standards and highlight the risks that PFAS-contaminated pesticides pose to Rhode Island’s residents and environment. RIDEM should act immediately to protect the state’s waters and safeguard public health.

²³ See Rhode Island Department of Environmental Management, *Our Mission*, <http://www.dem.ri.gov/programs/water/> (last visited April 29, 2021); Rhode Island Department of Environmental Management, *Strategic Plan 2019–2022*, <http://www.dem.ri.gov/director/documents/plan2018-22.pdf> (last visited April 29, 2021) (highlighting RIDEM’s goals to “improve water quality in fresh water rivers and lakes. . . [and] enhance monitoring capacity to support tracking changing conditions”).

²⁴ 46 R.I. Gen. Laws Ann. § 46-12-3.

²⁵ 46 R.I. Gen. Laws Ann. § 46-12-10.

²⁶ 250 R.I. Code R. § 150-05-3.1.

²⁷ See Rhode Island Department of Environmental Management, *Determination of a Groundwater Quality Standard for: Perflurooctanoic Acid (PFOA) and Perflurooctane Sulfonate (PFOS)*, *supra* note 19.

The Department’s Authority to Regulate PFAS in Pesticides

Rhode Island law grants the Department broad authority to regulate pesticide distribution, use, and application within the state.²⁸ This authority extends to so-called “inert” ingredients in pesticides.²⁹ Under that authority, there are a range of actions that the Department could take to protect the environment and residents from exposure to PFAS-contaminated pesticides. Most significantly, the Department has the authority to cancel or suspend the state registration for any pesticide that may cause “unreasonable adverse effects on the environment,” or which poses “an imminent hazard.”³⁰

In addition, the Department has the authority to regulate pesticide containers and the storage and disposal of pesticides.³¹ The Department could exercise that authority to address the issue of PFAS leaching from fluorinated containers. The Department also has the authority to issue “stop sale, use, or removal” orders to enforce the state’s pesticide laws.³²

The Department would not be alone in exercising its authority over pesticides to protect people and the environment. For example, the New York Department of Environmental Conservation acted quickly after learning of the presence of PFAS in Anvil by “quarantine[ing] Anvil 10 + 10 products statewide” and “launching a comprehensive investigation into the universe and use of products stored in [fluorinated HDPE] containers.”³³

It is critical that the Department act swiftly to protect residents and the environment. Waiting for EPA to address the issue puts residents and the environment at unnecessary risk. EPA has so far relied primarily on voluntary action by Clarke to recall Anvil shipped in fluorinated containers. According to EPA, Clarke has “voluntarily stopped shipment of any products in fluorinated HDPE containers and is conducting its own testing to confirm EPA results and product stability in un-fluorinated containers.”³⁴ EPA has “asked states with existing stock of [Anvil] distributed in fluorinated HDPE containers to discontinue use and hold until its final disposition is determined.”³⁵ EPA’s requests for voluntary action are insufficient to address the serious dangers posed by PFAS-contaminated pesticides. EPA’s actions do not apply to Mavrik, Permanone, or any other contaminated pesticide and do not apply to consumers, certified applicators, or others who may possess or apply PFAS-contaminated pesticides. The Department must act to protect residents and the environment.

²⁸ See, e.g., 23 R.I. Gen. Laws Ann. § 23-25-3 (“The purpose of this chapter is to regulate, in the public interest, the labeling, distribution, sale, storage, transportation, use and application, and disposal of pesticides as defined in this chapter.”).

²⁹ See 23 R.I. Gen. Laws Ann. § 23-25-6 (c) (“The director, when he or she deems it necessary in the administration of this chapter, may require the submission of the complete formula of any pesticide, including the active and inert ingredients.”).

³⁰ 23 R.I. Gen. Laws Ann. § 23-25-8.

³¹ 23 R.I. Gen. Laws Ann. § 23-25-19.

³² 23 R.I. Gen. Laws Ann. § 23-25-21.

³³ New York Department of Environmental Conservation, *Statement from New York State Department of Environmental Conservation Commissioner Basil Seggos on New Investigation of Potential PFAS Contamination* (January 15, 2021), <https://www.dec.ny.gov/press/122184.html>.

³⁴ U.S. Environmental Protection Agency, *News Release: EPA Takes Action to Investigate PFAS Contamination* (January 14, 2021), <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>.

³⁵ *Id.*

CLF and PEER's Requests

Given the dangers PFAS pose to Rhode Island's residents and environment and the growing evidence of widespread PFAS contamination in pesticides, CLF and PEER reiterate our request that the Department take the following actions:

- (1) Prohibit or suspend distribution and use of Anvil, Mavrik, Permanone, and any other pesticides shown to contain PFAS;
- (2) Develop and implement a plan to test all pesticide products registered in Rhode Island for PFAS contamination, prioritizing the most commonly used pesticides in the state;
- (3) Develop and implement a comprehensive environmental testing program to test for PFAS in areas where PFAS-contaminated pesticides have been applied, with a focus on comparing PFAS levels in such areas with PFAS levels in areas where contaminated pesticides have not been applied;
- (4) Coordinate with the Department of Health and other state agencies to develop a comprehensive plan for investigating the issue of PFAS contamination in pesticides, including identifying and addressing environmental contamination and potential health impacts; and
- (5) Schedule a meeting with the undersigned staff from CLF and PEER to discuss the issue further.

We appreciate your prompt attention to this urgent issue of public and environmental health and await your response.

Sincerely,



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