25 March 2019

The Honorable John Barrasso
Chairman, Committee on Environment and Public Works
United States Senate
307 Dirksen Senate Office Building
Washington, D.C. 20510

The Honorable Thomas Carper
Ranking Member, Committee on Environment and Public Works
United States Senate
513 Hart Senate Office Building
Washington, D.C. 20510

Re: Sludge Spreading with PFAS as a Threat to Our Food and Water

Dear Chairman Barrasso and Ranking Member Carper,

Thank you for scheduling a hearing on March 28th to examine the federal response to the risks associated with per- and polyfluoroalkyl substances (PFAS). I represent a public health organization based in Portland, Maine that works at the state and national level to ensure that all people have access to safe food and water, and products that are healthy for people and the planet. I’m writing now to urge you to include a newly emergent concern in your assessment, i.e. the potential for widespread PFAS contamination of farmland, agricultural products such as milk, and drinking water resulting from the spreading of sewage sludge to land as a fertilizer, a common practice in all fifty states.

Last week, Reuters reported on a Maine dairy farm that was ruined by unsafe PFAS pollution from twenty years of sewage and industrial sludge spreading (see attached story). The cow’s milk from this farm contained the highest levels ever reported of PFOS, a notorious PFAS. Two PFAS were also found at elevated levels in the drinking water on the farm and in a public water supply well. The sludge spreading at this site exposed thousands of consumers to PFAS in milk for up to thirty years and to PFAS in public drinking water for up to five years.

Sludge may be contaminated from the use of consumer, commercial, and industrial products that contain PFAS, and their eventual discharge into wastewater. Sludge, also known as biosolids, is the solid waste leftover after treatment of wastewater from sewage plants or industrial facilities. The U.S. Environmental Protection Agency encourages the beneficial reuse of sludge as an agricultural fertilizer and all sludge applications to farmlands are licensed and permitted by various state
Sludge may be directly applied to land or sent to composting facilities and mixed with other materials before being distributed to farms and the public.

Sludge spreading has remained a common practice since the 1970's. Yet PFAS in the environment have only been investigated in earnest for less than five years. That leads to two very serious and plausible concerns:

- Serious PFAS pollution may be lurking undiscovered beneath farmlands where sludge has been spread in the past; and
- Future sludge spreading may cause additional PFAS pollution unless it’s tested first and shown to contain PFAS at levels below regulatory concern.

I’ve attached three fact sheets that detail the unsafe levels of PFAS detected at the Maine dairy farm, report on levels of PFOS measured in milk around the world, and document that sludge spreading has caused serious PFAS pollution elsewhere and that the current levels of PFAS in sludge may not be in compliance with standards adopted in 2018 by the State of Maine in response to this dairy farm contamination.

In light of the serious implications of this evidence for public health and the environment, we urge you to ask federal agencies to answer these questions:

1. Are farmlands where sludge was spread in the past being tested for PFAS, and if not, how can you best ensure that such testing takes place in a timely manner?
2. Since dairy farms may be uniquely vulnerable to PFAS in sludge, what assurance can be provided that the cow’s milk from dairies is being screened for PFAS?
3. What standards exist to limit PFAS in sludge intended for land application, and to what extent is current sludge generation in compliance with those standards?
4. What affect does composting of sewage sludge containing PFAS, and distribution of that compost, have on the fate and transport of PFAS in the environment?
5. What are federal agencies doing to protect America’s food supply and drinking water from PFAS pollution associated with sludge spreading on the land?

Thank you for good oversight and investigation of the federal response to the risks of PFAS pollution. Should you have questions for us or require additional information, please contact my deputy director Patrick MacRoy at (207) 699-5796 or pmacroy@preventharm.org.

Respectfully submitted,

Michael Belliveau
Executive Director

cc: The Honorable Susan Collins
The Honorable Angus King

(207) 699-5795 ♦ ourhealthyfuture.org ♦ info@ourhealthyfuture.org
The curious case of tainted milk from a Maine dairy farm

Richard Valdmanis, Joshua Schneyer

ARUNDEL, Maine (Reuters) - For Maine dairy farmer Fred Stone, the discovery in 2016 that his cows were producing tainted milk has since brought financial ruin and threatened to shut down a century-old family business.

Now state regulators and health experts are investigating whether the contamination could reflect a much broader problem for farms that used similar methods to fertilize their land.

The chemicals on Stone’s farm likely came from biosolids, or nutrient-rich sewage from municipal utilities, that he spread across his fields, according to a report last year by Maine’s Department of Environmental Protection (DEP). The chemicals are known as perfluoroalkyl substances, or PFAS – some of which have been linked to cancers, liver damage, low birth weight and other health problems.

The discovery of contaminated sites in Maine and around the country prompted Maine Governor Janet Mills this month to form a task force to study the extent of PFAS contamination and suggest protective measures. The state DEP says testing for the chemicals is underway at more than 95 sites.

“Staff has been specifically working on identifying farms statewide that may have received sludge and identifying the original source,” department spokesman David Madore said in a statement to Reuters.

Patrick MacRoy, deputy director at the Maine-based Environmental Health Strategy Center, said the contamination at the Stoneridge Farm raises questions about the safety of biosolids used at farms nationwide.

“The Stone case is incredibly troubling because the source of exposure - waste sludge - is something that is also spread across hundreds of farms in Maine and thousands nationally,” he said.

Experts said that far more research is needed to determine how sludge-spreading programs may be contributing to contamination of groundwater, crops, or finished products such as milk.

“Maybe this one farm is an oddball in Maine, but without further testing, there’s no way to be sure,” said Michael Rainey, a former biosolids inspector at the health department in neighboring New Hampshire.

Alan Bjerga, a spokesman for the National Milk Producers Federation, said that his organization believed the Stoneridge case to be an isolated event.

“We see no wide threat to the milk supply,” he said in a statement.
Grease and water-repellent PFAS have been used for decades in cookware, specialty paper, fabrics, firefighting foam and other products. State and federal regulators have been scrambling to set safety standards for human exposure to some of the chemical compounds.

Scores of lawsuits have been filed in pollution cases seeking billions of dollars from chemical manufacturers and industrial PFAS users. Two major cases have already settled in recent years for a combined $1.5 billion.

‘FOREVER CHEMICALS’

Stone and his wife Laura Stone run the Stoneridge Farm on 100 acres of land in southern Maine, one of hundreds of small-scale dairy operations across the U.S. northeast prized for the quality of their milk, cream and butter.

The Stones started spreading treated sewage in the 1980s as part of a state program that would help utilities get rid of the waste and fertilize pastures. They also used one delivery of sludge waste from a paper mill.

Concerns about PFAS in the farm’s milk first arose in 2016, when the local water district found the pollutants - often referred to as “forever chemicals” because they don’t break down easily - in a well it maintained on the Stones’ land.

Stoneridge informed its milk distributor, Oakhurst, and the state DEP. Additional tests found high levels of PFAS in Stoneridge’s milk, soil, hay, and cow manure. The areas of highest soil contamination overlapped with where the sewer district sludge had been heaped, Stone said.

The Environmental Protection Agency has said that biosolids spreading programs are active in all 50 states. In Maine, 66 sites are currently permitted for sludge spreading, according to state data.

The numbers were higher during the years Stoneridge participated in the state-sponsored waste-spreading program, between 1983 and 2004. Data compiled in 2000 by the Toxics Action Network, an environmental group, showed that 226 sites, mostly farms, had sludge-spreading permits.

Much of the regulatory push around PFAS so far has focused on water. In 2016, the Environmental Protection Agency set a lifetime “health advisory” for two of the compounds - PFOS and PFOA, which a growing body of research has linked to health problems. The EPA recommended that drinking water should contain no more than 70 parts per trillion of these chemicals combined.

There’s no federal standard for safe levels in milk. But Maine public health officials said in 2017 that milk with PFOS exceeding 210 parts per trillion should be considered “adulterated” and banned from sale.

So far, this ban has only affected Stoneridge, whose milk had levels as high as 1,420 parts per trillion.

FADING FAMILY TRADITION

Fred Stone, 63, fears he’s nearing the end of a century-old family tradition. The contamination ordeal has already put him in $500,000 of debt, he said. He’s considering
selling some land and looking for a job.

“My grandfather, my father, and myself, we’ve all been dairy farmers here,” he said, wearing coveralls and mud-stained rubber boots as he walked the farmland his family bought in 1914.

Until a few weeks ago, Stone was still trying to salvage his dairy operation. He purchased several dozen new cows, installed a $20,000 water-filtration system and stopped using his farm’s hay for feed.

The effort at first seem to work. Last year, test results on his farm’s milk came back clean, and he was allowed to sell milk to Oakhurst again. But PFOS reappeared in the milk within months, causing distributor Oakhurst to permanently end its business relationship with Stoneridge.

“When they dropped us, that was the end of our milk market,” Stone said. “So that was the end of us.”

Dairy farmer Fred Stone watches the milk collected the previous day go down the floor drain, after discovering the soil, hay, and the milk from the cows on the farm contain extremely high levels of PFAS chemicals resulting from a 1980's state program to fertilize the pastures with treated sludge waste and making the milk unsuitable for sale, at the Stoneridge Farm in Arundel, Maine, U.S., March 11, 2019. Picture taken March 11, 2019. REUTERS/Brian Snyder
## Unsafe Levels of PFAS Chemicals at a Maine Dairy Farm

**PFOS and PFOA in Milk, Drinking Water & Soils Exceed Current Action Levels**

Values reported in parts per trillion (ppt)

<table>
<thead>
<tr>
<th>Media</th>
<th>PFAS Chemicals</th>
<th>Highest Level Measured(^1)</th>
<th>Most Recent Action Level(^2)</th>
<th>Times Above Action Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MILK</strong></td>
<td>PFOS: 1,420</td>
<td>210</td>
<td></td>
<td>7 x</td>
</tr>
<tr>
<td></td>
<td>PFOA: &lt; 50</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td><strong>DRINKING WATER – Farm Well</strong></td>
<td>PFOS: 42.1</td>
<td>7</td>
<td></td>
<td>6 x</td>
</tr>
<tr>
<td></td>
<td>PFOA: 8.9</td>
<td>11</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td><strong>DRINKING WATER – Public Well</strong></td>
<td>PFOS: 76</td>
<td>7</td>
<td></td>
<td>10 x</td>
</tr>
<tr>
<td></td>
<td>PFOA: 13</td>
<td>11</td>
<td></td>
<td>1 x</td>
</tr>
<tr>
<td><strong>SOILS</strong></td>
<td>PFOS: 878,000</td>
<td>21,000</td>
<td></td>
<td>42 x</td>
</tr>
<tr>
<td></td>
<td>PFOA: 23,600</td>
<td>9,500</td>
<td></td>
<td>2 x</td>
</tr>
<tr>
<td><strong>MANURE PILE</strong></td>
<td>PFOS: 20,330</td>
<td>-</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>PFOA: 3,206</td>
<td>-</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td><strong>HAY</strong></td>
<td>PFOS: 9,669</td>
<td>-</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>PFOA: 2,086</td>
<td>-</td>
<td></td>
<td>?</td>
</tr>
</tbody>
</table>

Sources (all samples were from Stoneridge Farm, Arundel, Maine):

1. **Milk**: Maine Department of Agriculture, Conservation, and Forestry

2. **Drinking Water (Public)**: Kennebunk, Kennebunkport and Wells Water District, Maine

**Drinking Water (Farm), Manure, Hay**: Maine Department of Environmental Protection (higher levels of PFAS were found by the water district in a monitoring well adjacent to the farm well.)

**Soils**: Remedial Action Guideline to prevent leaching from soil to groundwater, set by Maine Department of Environmental Protection.

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Environmental Health Strategy Center | www.ourhealthyfuture.org | March 2019
## Highest Level of PFOS in Milk Reported at Maine Dairy Farm

**Adulterated Milk Containing Unsafe Levels of PFOS cannot be sold for Human Consumption**

Milk and other agricultural products are not routinely tested for perfluorooctanesulfonic acid (PFOS) or other per- and polyfluoroalkyl substances (PFAS). Although test data are limited, the PFOS levels measured in milk from Stoneridge Farm in Arundel, Maine are far higher than reported in any study, based on a sampling of the published scientific literature (see links for studies).

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Location</th>
<th>PFOS in Milk, Highest Level (ppt)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine DEP/DACF *</td>
<td>Arundel, Maine</td>
<td>1,420</td>
<td>Raw milk samples measured 1,420 ppt PFOS in November 2016, 938 ppt in January 2017, and then lower, including 220 ppt in January 2019.</td>
</tr>
<tr>
<td>Wang, et al. (2010)</td>
<td>China</td>
<td>695</td>
<td>As reported in Sungur, milk was purchased at retail in China between 2008 and 2009, with results ranging from 5 to 695 ppt.</td>
</tr>
<tr>
<td>Guerranti, et al. (2013)</td>
<td>Italy</td>
<td>360</td>
<td>Based on a mean of samples over the limit of detection in a small pilot study.</td>
</tr>
<tr>
<td>Maine CDC</td>
<td></td>
<td>210 **</td>
<td>Level at which Milk is “Adulterated”</td>
</tr>
<tr>
<td>Xing, et al. (2016)</td>
<td>China</td>
<td>173</td>
<td>Of 91 samples of milk purchased at retail, the mean level of PFOS measured was 24.5 ppt.</td>
</tr>
<tr>
<td>Young, et al. (2012)</td>
<td>United States</td>
<td>160</td>
<td>Reported at another dairy farm impacted by sludge spreading near Decatur, Alabama. PFOS was not detected in 60 other milk samples.</td>
</tr>
<tr>
<td>Yang, L, et al. (2015)</td>
<td>China</td>
<td>127</td>
<td>Twelve samples of milk from retail markets in eight provinces were tested.</td>
</tr>
<tr>
<td>Ericson et al. (2008)</td>
<td>Spain</td>
<td>121</td>
<td>As reported in Sungur, whole and semi-skim milk from the Spain market was tested for PFOS, with levels ranging from 14 to 121 ppt.</td>
</tr>
</tbody>
</table>

* Sources: Investigation report, Maine Department of Environmental Protection (DEP) and milk testing, Maine Department of Agriculture, Conservation, and Forestry (DACF). Available on request.

** Based on a 2016 Reference Dose from the U.S. Environmental Protection Agency, which is ten times LESS protective of human health than a 2018 Minimal Risk Level recommended by the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services.

** Methods: A search of PubMed for “PFAS Milk”, “PFOS Milk”, and “PFC Milk” was conducted and the results reviewed for relevant studies of food for human consumption (excluding breast milk). Only selected studies reporting the highest results are presented in the table.
Sludge Spreading Threatens PFAS Pollution of Food & Drinking Water

Sludge – the solid waste left over after the treatment of industrial wastewater and domestic sewage – is often polluted from the manufacture, use, and disposal of extremely persistent, toxic chemicals known as per- and polyfluoroalkyl substances (PFAS). When spread on farmlands as fertilizer, PFAS-containing sludge has contaminated milk and drinking water to unsafe levels. Both past and current sludge spreading remains a serious concern.

**Known PFAS Pollution from Sludge Spreading on Farmlands**

- **Arundel, Maine**: PFAS contamination of a public drinking water well lead investigators to evaluate a neighboring dairy farm for PFAS in 2017. Soil tests found PFAS as high as 878,000 ppt PFOS and 23,600 ppt PFOA. Milk from the farm had PFOS levels as high as 1420 ppt, and contamination was also identified in the hay and manure. The source was identified as sludge spreading which occurred between 1983 and 2004.

- **Decatur, Alabama**: An industrial facility discharged PFAS waste into the sewers between 1996 and 2008, and the sewage sludge was spread on 5,000 acres of farm land. Later sludge testing revealed PFOA levels of up to 2,531,000 ppt and PFOS levels of up to 1,296,000 ppt. In farm fields where the sludge was spread, PFOA measured up to 317,000 ppt and PFOS levels to 408,000 ppt. The PFOS levels in cow’s milk from an impacted dairy were as high as 170 ppt.

- **Sauerland, Germany**: In 2006, PFAS pollution followed the spreading of “soil improver” that included industrial sludge on more than 1,000 farm sites. The sludge contained total levels of PFOA and PFOS of up to 8,600,000 ppt. Soils tested at high as 5,500,000 ppt. The PFAS spread into surface waters, contaminating public drinking water supplies, as well as fish. Limited milk testing did not result in levels exceeding 10 ppt.

- **North Carolina**: In 2015, PFAS pollution of surface waters was linked to sludge spreading in the surrounding area. Surface water levels reached a high of 1,020 ppt PFOA and 720 ppt PFOS. Sludge levels were 1,130 ppt PFOA and 1,680 ppt PFOS, among other PFAS.

**PFAS Still Routinely Contaminate Sewage Sludge**

- **Sepulvado, et al (2011)**: In a study of the levels and transport of PFAS in municipal sludge, PFOS was the dominant PFAS chemical, with levels ranging from 80,000 to 219,000 ppt. Soils treated with municipal sludge were found to have levels of PFOS ranging from 2,000 to 485,000 ppt. Levels in soil increased linearly in relation to volume of sludge applied.

- **North East Biosolids & Residuals Association (2017)**: PFOS in the sludge from 22 facilities in New Hampshire and the Northeast averaged of 34,000 ppt, with a high of 390,000 ppt. Levels of eight other PFAS were also identified, with PFBA having the highest average concentration at 34,600 ppt.

- **Maine Screening Levels (2018)**: Maine established lower levels in 2018 for the screening of solid waste for beneficial reuse, including sludge applications, recognizing the potential for PFAS contamination. These levels are 5,200 ppt for PFOS and 2,500 ppt for PFOA. However, there is currently no requirement for sludge to be tested for compliance.