PUBLIC HEALTH

TOWN OF SOUTH HADLEY MASSACHUSETTS

SHARON HART, Director of Public Health

NOTICE

BOARD OF HEALTH MEETING
&
AGENDA

January 13, 2026

6:00 p.m.

Join Zoom Webinar from your Computer:
Join from PC, Mac, iPad, or Android:
Passcode: 974062

https://us02web.zoom.us/j/86985832184?pwd=MJr8b9UoMurKgdrr16k43GsRN5cKLF.1

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NOTE: Not all the topics listed in this notice may actually be reached for discussion. In addition, the topics listed are those which the Chair reasonably expects will be discussed as of the date of this notice.

To: Board of Health Members

From: Sharon D. Hart, Director of Public Health

Re: A Board of Health Meeting will be held on Tuesday, January 13, 2026 at 6:00 p.m. at the South Hadley Library.

1: The Chair will announce that the meeting is being recorded by either the Board/Committee or a member of the audience.

2: Chair to Call the Meeting to Order

3: Acceptance of the Minutes of the December 9, 2025, meeting.

4: Announcements/Open Forum (10 Minutes)

5: Director's Report

6: New Business:

(a): Climate Change Article - Stephen Frantz

(b): Glyphosate Articles - Stephen Frantz

(c): PFAS Articles - Stephen Frantz

(d): South Hadley 2025 Prevention Needs Assessment Survey Data - Hannah Durham

7: Old Business:

(a): Kratom Regulation

8: Set Next Meeting Date – (_____) at 6:00 p.m. at South Hadley Public Library

9: Adjourn meeting

South Hadley
Board of Health Meeting
Hybrid

Date: 12-09-25 Time: 6:00 p.m.

Members: Karen Walsh Pio: Present Tony Judge: Present Dr. Michael Rosner: Present
Stephen Frantz: Present Charles Scott: Present
Staff: Sharon Hart: Present Jennifer Jernigan: Present Hannah Durham: Present
Guests (Zoom): Melody, Lora R., Allison S.

1. **Chair called the meeting to order 6:05 p.m.**

2. **Acceptance of the meeting minutes of 11-19-25.**
   a. Motion to accept 11-19-25 minutes: C. Scott, 2nd: T. Judge.
   Motion carried, unanimous approval.

3. **Announcements/Open Forum (10 Minutes)**
   None.

4. **Director's Report – Director Hart provided an update on the latest activities and initiatives.**
   - Budget Task Force Presentation: Director Hart presented an overview of the department's key areas of responsibility and oversight and how these various services are funded at the Budget Task Force meeting on 11/17/25. She highlighted the need for continued funding for essential public health services including nursing, disease surveillance, emergency management, and animal control, in addition to inspections and outreach & education.
   - Diabetes Management Program facilitated by Assistant Director Jen Jernigan on 11/20/25 at Council on Aging was successful - participants were very engaged.
   - Asthma & Air Quality Project: Department Environmental Epidemiologist Intern and Director Hart piloted survey with small group of South Hadley students and families who have asthma. Using initial feedback to revise the survey before distributing to larger group of students and families.
   - Emergency Management: Director Hart working with Massachusetts Emergency Management Agency (MEMA) to offer additional training for first responders to support future matriculation into senior emergency management positions. Police Department, Fire Depts. 1 and 2 are continuing drone training. Information on town warming shelters and winter storm safety guidance shared with the public.
   - Opioid & Substance Use:
     - Department participated in several events for South Hadley Public School families – shared resources related to mental health, substance use and recovery support, and family wellbeing.
     - Shared summary of 2025 Prevention Needs Assessment Survey data for South Hadley with facilitator of South Hadley High School Peer Leaders – seeking opportunities to collaborate on communications or programming.
     - Note on South Hadley overdose and opioid-related EMS call* data:
       2023 – 49 opioid-related EMS calls; 2024 – 19 opioid-related EMS calls;

2025 – as of Sept. 2025, call total is lower than 2024, but data is still being compiled by MA Dept. Public Health as the year concludes.
**Not all calls are clinical overdoses and not all are non-fatal.*

5. Old Business:

a) Kratom Regulation

- No decision by state-level kratom legislation yet. Board of Health will consider outcome of the joint committee review of state regulations and review the draft of the South Hadley regulation at January meeting.
- Public comment from three meeting attendees emphasized the risks of unregulated, synthetic kratom products (e.g. products with significant amounts of added 7OH) and the importance of regulating natural kratom like any other supplement and including a minimum age to purchase. Members of the public spoke to the benefits of natural kratom for non-pharmaceutical relief from severe chronic pain.

b) Second Generation Anticoagulant Rodenticides – Stephen Frantz

- Under review by Town Counsel.

c) Noisome Trade Regulation

- Edit list of noisome trades to include only those relevant to South Hadley, including:
  - Stone quarry and/or sand and gravel pit
  - Asphalt batch mix or drum mix plant and/or crushed stone facility
  - Pulp & paper mills
  - Plastic manufacturing plants
  - Sewage sludge treatment / composting operations
  - Grease/Food Oil Processing Recycling Operations
  - Battery Energy Storage Facilities
  - Power/Energy Facility – Board accepts suggestion to include "power" and "energy"
- Request to edit "Grandfather Clause" to non-gendered term, such as "Legacy Rights Clause."
- Request to add a statement about relevant Massachusetts General Laws that take precedence.
- Director Hart will assemble and share with the Board a list of existing facilities and businesses that this regulation would impact.

Motion to pass with annotations: S.Frantz, 2nd: C.Scott.
Motion carried, unanimous approval.

d) Regulation of the Restriction of the Sale of Nitrous Oxide

- Risks of misuse and past patterns of misuse discussed.

Motion to pass: S. Frantz, 2nd: T. Judge.
Motion carried, unanimous approval.

e) PFAS Articles – Stephen Frantz

- Tabled to January Board meeting.

6. **Set Next Meeting Date: <u>January 13, 2025</u> at 6:00 p.m. at South Hadley Public Library**
   Motion to adjourn: <u>S.Frantz</u>; 2nd <u>M.Rosner</u>
   Motion carried, unanimous vote to adjourn.

7. **Board of Health meeting adjourned: 7:09 p.m.**

Respectfully submitted,

Hannah Durham
Public Health Program & Administrative Coordinator

‘Attack on Independent Science’: Trump EPA Removes All Mention of Human-Caused Climate Crisis From Public Webpages

Climate scientist Daniel Swain called it “a deliberate effort to misinform.”

By STEPHEN PRAGER · Dec 09, 2025

Share

The Trump administration has removed all references to human-caused climate change from Environmental Protection

Agency webpages, as well as large amounts of data showing the dramatic warming of the climate over recent decades and the resulting risks.

According to a Tuesday report from the *Washington Post*, one page on the "Causes of Climate Change" stated as recently as October that "it is unequivocal that human influence has warmed the atmosphere, ocean, and land," a statement that reflects the overwhelming consensus in peer-reviewed literature on climate.

Trump's Climate Policies Could Cause Mass Death of Global Poor, Analysis Warns

Trump DOJ Sides With Roundup Manufacturer Over Cancer Victims in Supreme Court Case

That statement is now nowhere to be found, with those that remain only mentioning "natural" causes of planetary warming like volcanic activity and variations in solar activity.

"The new, near-exclusive emphasis on natural causes of climate change on the EPA's website is now completely out of sync with all available evidence demonstrating overwhelming human influence on contemporary warming trends," explained

Daniel Swain, a climate scientist at the University of California Agriculture and Natural Resources, who posted about the changes on social media.

The Intergovernmental Panel on Climate Change (IPCC), which examines tens of thousands of studies from around the globe, found that virtually all warming since the dawn of the industrial era can be attributed to human carbon emissions.

Pages about the catastrophic results of climate change have also been scrubbed: One of them allowed users to view several climate change indicators, like the historic decline of Arctic sea ice and glaciers and the increased rates of coastal

flooding due to rising sea levels. That page has been deleted entirely.

Another page, which answered frequently asked questions about climate change, now no longer includes questions like, “Is there scientific consensus that human activities are causing today’s climate change?” “How can people reduce the risks of climate change?” and “Who is most at risk from the impacts of climate change?” The page provides no indication that climate change is a human-caused phenomenon, instead only discussing natural factors.

That page links to another that has since been deleted. It once provided extensive information about the risks climate change poses to human health, “from increasing the risk of extreme heat events and heavy storms to increasing the risk of asthma attacks and changing the spread of certain diseases carried by ticks and mosquitoes.” Another deleted page discussed the impacts of climate change on children’s health and low-income populations.

“This is, I think, one of the more dramatic scrubbings we’ve seen so far in the climate space,” said Swain. “This website is now completely incorrect regarding the changes in climate that we’re seeing today and their causes... It’s clearly a deliberate effort to misinform.”

During his 2024 campaign for reelection, President Donald

Trump and his affiliated super political action committees received more than $96 million in direct contributions from oil and gas industry donors, according to a January report from Climate Power. Since retaking office, he has moved to dramatically expand the extraction and use of planet-heating fossil fuels while eliminating investment in clean energy and electric vehicles.

Rachel Cleetus, senior policy director for the Climate and Energy Program at the Union of Concerned Scientists, said, "Deleting and distorting this scientific information only serves to give a free pass to fossil fuel polluters who are raking in profits even as communities reel from extreme heatwaves, record-breaking floods, intensified storms, and catastrophic wildfires."

Cleetus said that the purging of climate information from EPA sites was a prelude to "the likely overturning of the endangerment finding, a legal and scientific foundation for standards to limit the heat-trapping emissions driving climate change and threatening human health."

In July, EPA Administrator Lee Zeldin unveiled a proposal to rescind the 2009 finding, which determined that climate change endangers human life and serves as the legal basis for greenhouse gas regulations under the Clean Air Act.

Undermining climate science is core to that effort, which Andrew Dessler, a climate scientist at Texas A&M, said at the

time, “could unravel virtually every US climate regulation on the books, from car emissions standards to power plant rules.”

Shortly after Zeldin announced the rule change, the Department of Energy cobbled together a “Climate Working Group” comprising five authors handpicked by Secretary Chris Wright to produce a climate report that disputes the IPCC’s findings and the scientific consensus on climate change.

The report did not undergo peer review and omitted around 99% of the scientific literature the IPCC relied on for its comprehensive findings. A group of climate scientists that independently reviewed the paper found that it “exhibits pervasive problems with misrepresentation and selective citation of the scientific literature, cherry-picking of data, and faulty or absent statistics.”

Cleetus said Tuesday that “EPA is trying to bury the evidence on human-caused climate change, but it cannot change the reality of climate science or the harsh toll climate impacts are taking on people’s lives... This isn’t just about data on a website; it’s an attack on independent science and scientific integrity.”

THE HILL

Trump admin backs Monsanto effort to limit Roundup lawsuits over glyphosate

Rachel Frazin

Tue, December 2, 2025 at 7:07 PM UTC · 2 min read

The Trump administration is backing Monsanto in its effort to get the

Supreme Court to shield it from liability over cancer claims related to its Roundup weedkiller, a move that could anger the Trump administration's allies in the Make America Healthy Again (MAHA) movement.

The Trump administration filed a brief with the Supreme Court arguing that lawsuits alleging that Monsanto failed to warn consumers of the health impacts of its Roundup weedkiller are preempted by federal law.

The brief comes in support of Monsanto's effort to get the Supreme Court to overturn a lower court's ruling that the company had to pay damages for failing to warn about its product's health impacts.

The Trump administration's brief notes that the Environmental Protection Agency (EPA) considers Roundup ingredient glyphosate not likely to be cancer causing and has approved its use.

It says that states should not be able to impose further requirements that give rise to failure-to-warn lawsuits.

"The labeling requirements imposed by Missouri's failure-to-warn law are preempted by [the Federal Insecticide, Fungicide, and Rodenticide Act,]" the brief states.

The specific case at issue is a claim from Missouri under whose failure-to-warn law cancer patient John Durnell was awarded $1.25

million.

The case could have far-reaching impacts, as Monsanto faces 100,000 similar suits, according to its court brief.

Monsanto parent company Bayer released a statement in support of the government's intervention, saying the Supreme Court will now be more likely to hear its case.

"The support of the U.S. Government is an important step and good news for U.S. farmers, who need regulatory clarity. The stakes could not be higher as the misapplication of federal law jeopardizes the availability of innovative tools for farmers and investments in the broader U.S. economy," said Bayer CEO Bill Anderson in a written statement.

However, the Trump administration's move could draw ire from its friends in the MAHA movement, which has been skeptical of pesticides.

MAHA-aligned activists have rallied against what they view as a congressional effort to shield pesticide companies from liability.

While the EPA has said that there's insufficient evidence that glyphosate causes illnesses in humans, the World Health

Organization's International Agency for Research on Cancer has classified the chemical as "probably carcinogenic to humans."

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News | Misconduct

Glyphosate study from 2000 retracted amid corporate-influence concerns

The authors didn't disclose financial compensation they received from Monsanto for their work on a ghostwritten paper about the herbicide's safety

by **Dalmeet Singh Chawla, special to C&EN**

December 5, 2025 • 5 min read

The journal *Regulatory Toxicology and Pharmacology* (*RTP*) has retracted a highly cited paper from 2000 that concluded that the herbicide glyphosate is safe for humans after a scientist and historian raised concerns that the study's authors hadn't disclosed that Monsanto, which produced the glyphosate-containing product Roundup, paid them for their work. In addition, Monsanto employees played an undisclosed key role in drafting the report.

Evidence of Monsanto's role in drafting the study emerged during litigation against the company in 2017. Corporate emails released at the time revealed that the firm's employees had ghostwritten the review internally. Monsanto has since denied the allegations.

But *RTP* acted only after Alexander Kaurov, an astrophysicist at the Victoria University of Wellington, and Naomi Oreskes, a historian of science at Harvard University, reported the issues to the journal.

A lengthy retraction notice published by *RTP* says, "The potential financial compensation raises significant ethical concerns and calls into question the apparent academic objectivity of the authors in this publication."

RTP notes in the retraction notice that its editors approached study coauthor Gary M. Williams, a pathologist at New York Medical College, for an explanation on the financial compensation, among other issues, but didn't hear back.

C&EN has also reached out to Williams for a comment.

The other two authors of the study—Robert M. Kroes, then based at Utrecht University, and Ian C. Munro, then based at Cantox Health Sciences International—have since passed away.

In its retraction notice, *RTP* did not say why it acted only now, after Kaurov and Oreskes raised their concerns, despite the fact that evidence of both Monsanto's payment to the authors and its employees' direct and undisclosed role in drafting the paper emerged more than 8 years ago.

Monsanto's role was not highlighted

Before reaching out to *RTP*, Kaurov and Oreskes authored an opinion article in Undark

“This omission suggests that the authors may have misrepresented their unique roles and the collaborative nature of the work presented,” the retraction notice reads. “The failure to disclose the involvement of Monsanto personnel in the writing process compromises the academic independence of the presented findings and conclusions drawn in the article regarding carcinogenicity.”

Kaurov tells C&EN that there are more glyphosate papers that are widely known to be ghostwritten, noting that he and Oreskes chose to highlight this one because it was the oldest one. Kaurov says he’s surprised that no one else had contacted the journal asking them to pull the paper since the revelations of Monsanto’s involvement in drafting it emerged in 2017.

“When we asked for retraction, we asked for retraction on the basis of it being ghostwritten, not on the basis of it being incorrect,” Kaurov notes. Now, he has written to another journal, requesting retraction of another ghostwritten glyphosate paper.

“There’s actually several manuscripts [regarding glyphosate] that the core authors have been involved in, and I think Monsanto’s hand was different in each of them,” says Alexandra Maertens, a computational toxicologist at the Johns Hopkins Bloomberg School of Public Health. “This should absolutely have been disclosed.”

The retracted study was often cited

While the study has so far been cited more than 1,300 times, according to Google Scholar, and some analysts believe it has been influential, Maertens doesn’t think the 2000 review was as impactful on the risk assessment of glyphosate as some critics believe. “I feel like people are overestimating, just going with the number of citations, how impactful it was,” she says. “The reality is you can cite things all the time, and regulatory agencies don’t necessarily care. They do their own assessments.”

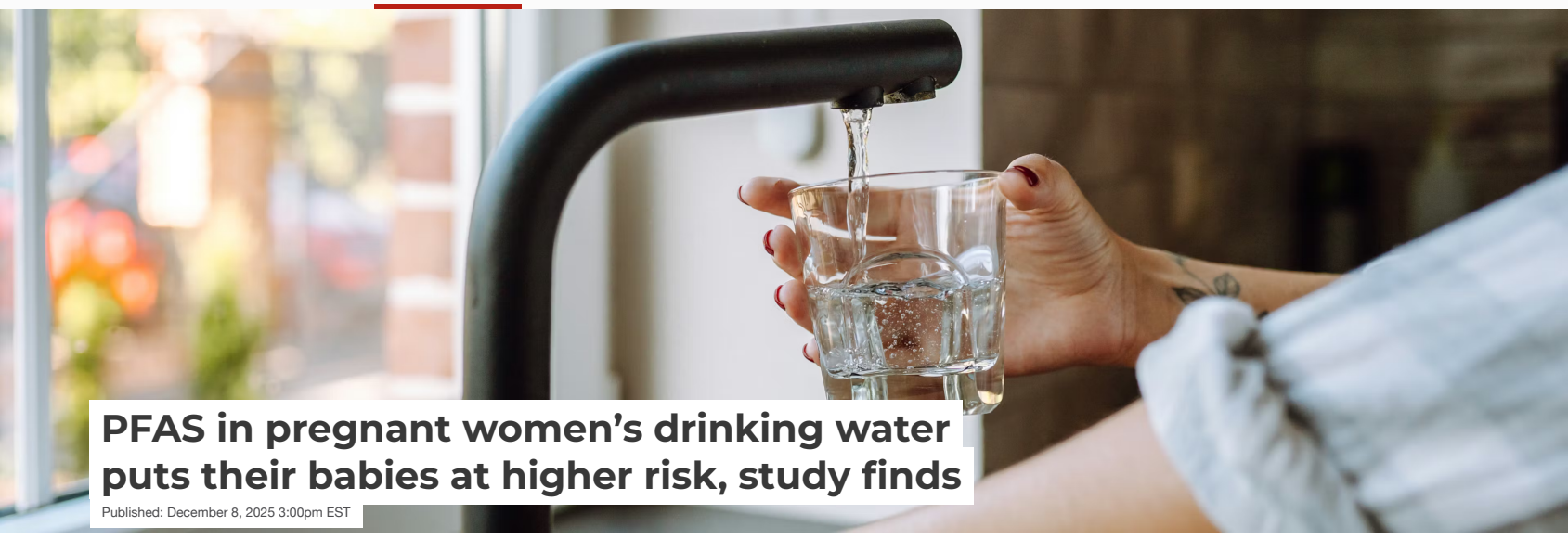
According to the retraction notice, the 2000 review paper based its conclusions on the toxicity of glyphosate solely on unpublished studies produced by Monsanto and didn’t include other long-term chronic toxicity and carcinogenicity studies that were already reported by 1999.

“In their article the authors state that they are aware of other studies, that were unpublished and not available,” the retraction notice states. “However, the authors do not specify to what extent they tried to incorporate the findings of these (unpublished) studies. The reasons for this remain undisclosed but bring into question the broader objectivity of the conclusions presented.”

Still, Kaurov says he’s pleased with the speedy retraction: within a month of reaching out to *RTP*, the journal editor responded and confirmed that an internal probe by the publication had come to the same conclusion. A few days ago, after a gap of 2–3 months, the journal issued the retraction notice. “Three months is not that bad,” Kaurov says.

Monsanto was acquired by Bayer in 2018. Since acquisition, Bayer has set aside more than $16 billion to deal with US lawsuits alleging that the firm’s glyphosate-based herbicides cause cancer. The company has paid about $11 billion to settle US claims so far but still faces more than 60,000 cases in state and federal courts.

Bayer did not respond to C&EN’s request for comment by press time.



PFAS in pregnant women's drinking water puts their babies at higher risk, study finds

Published: December 8, 2025 3:00pm EST

Studies show PFAS can be harmful to human health, including pregnant women and their fetuses. Olga Rolenko/Moment via Getty Images

When pregnant women drink water that comes from wells downstream of sites contaminated with PFAS, known as "forever chemicals," the risks to their babies' health substantially increase, a new study found. These risks include the chance of low birth weight, preterm birth and infant mortality.

Even more troubling, our team of economic researchers and hydrologists found that PFAS exposure increases the likelihood of extremely low-weight and extremely preterm births, which are strongly associated with lifelong health challenges.

What wells showed us about PFAS risks

PFAS, or perfluoroalkyl and polyfluoroalkyl substances, have captured the attention of the public and regulators in recent years for good reason. These man-made compounds persist in the environment, accumulate in human bodies and may cause harm even at extremely low concentrations.

Most current knowledge about the reproductive effects of PFAS comes from laboratory studies on animals such as rats, or from correlations between PFAS levels in human blood and health outcomes.

Both approaches have important limitations. Rats and humans have different bodies, exposures and living conditions. And independent factors, such as kidney functioning, may in some cases be the true drivers of health problems.

We wanted to learn about the effects of PFAS on real-world human lives in a way that comes as close as possible to a randomized experiment. Intentionally exposing people to PFAS would be unethical, but the environment gave us a natural experiment of its own.

Help knowledgeable voices rise above the noise

Support The Conversation

We looked at the locations of wells that supply New Hampshire residents with drinking water and how those locations related to birth outcomes.

We collected data on all births in the state from 2010 to 2019 and zoomed in on the 11,539 births that occurred within 3.1 miles (5 kilometers) of a site known to be contaminated with PFAS and where the mothers were served by public water systems. Some contamination came from industries, other from landfills or firefighting activities.

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Disclosure statement

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Bo Guo and Derek Lemoine do not work for, consult, own shares in or receive funding from any company or organization that would benefit from this article, and have disclosed no relevant affiliations beyond their academic appointment.

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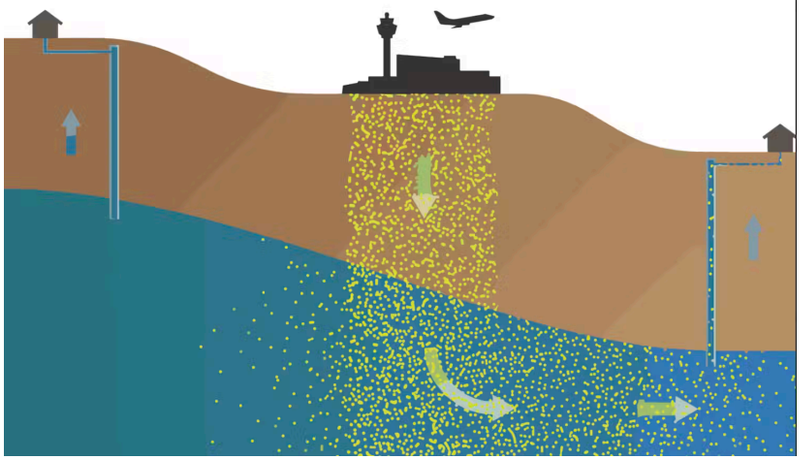


A conceptual illustration shows how PFAS can enter the soil and eventually reach groundwater, which flows downhill. Industries and airports are common sources of PFAS. The homes show upstream (left) and downstream (right) wells. Melina Lew

PFAS from contaminated sites slowly migrate down through soil into groundwater, where they move downstream with the groundwater's flow. This created a simple but powerful contrast: pregnant women whose homes received water from wells that were downstream, in groundwater terms, from the PFAS source were likely to have been exposed to PFAS from the contaminated site, but those who received water from wells that were upstream of those sites should not have been exposed.

Using outside data on PFAS testing, we confirmed that PFAS levels were indeed greater in "downstream" wells than in "upstream" wells.

The locations of utilities' drinking water wells are sensitive data that are not publicly available, so the women likely would not have known whether they were exposed. Prior to the state beginning to test for PFAS in 2016, they may not have even known the nearby site had PFAS.

PFAS connections to the riskiest births

We found what we believe is clear evidence of harm from PFAS exposure.

Women who received water from wells downstream of PFAS-contaminated sites had on average a 43% greater chance of having a low-weight baby, defined as under 5.5 pounds (2,500 grams) at birth, than those receiving water from upstream wells with no other PFAS sources nearby. Those downstream had a 20% greater chance of a preterm birth, defined as before 37 weeks, and a 191% greater chance of the infant not surviving its first year.

Per 100,000 births, this works out to 2,639 additional low-weight births, 1,475 additional preterm births and 611 additional deaths in the first year of life.

Looking at the cases with the lowest birth weights and earliest preterm births, we found that the women receiving water from wells downstream from PFAS sources had a 180% greater chance of a birth under 2.2 pounds (1,000 grams) and a 168% greater chance of a birth before 28 weeks than those with upstream wells. Per 100,000 births, that's about 607 additional extremely low-weight births and 466 additional extremely preterm births.

Median estimates of rise in infant harm from PFAS exposure

A study found women who received water from wells downstream of PFAS-contaminated sites saw significantly more infant mortality, low-weight and pre-term births than those not exposed.

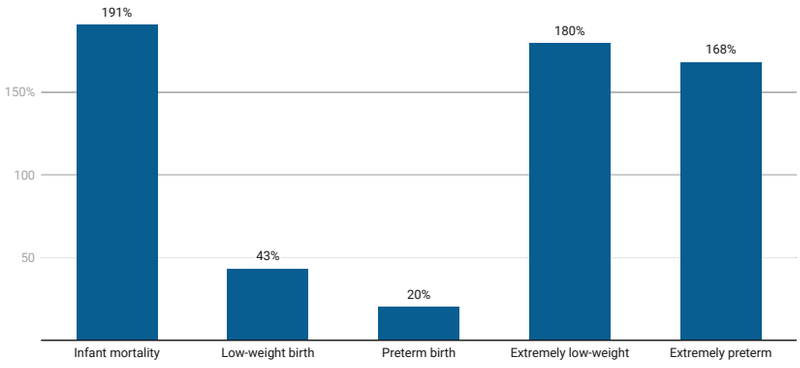


Chart: The Conversation, CC-BY-ND • Source: Robert Baluja, et al., 2025 • Get the data • Embed • Download image • Created with Datawrapper

PFAS contamination is costly

When considering regulations to control PFAS, it helps to express the benefits of PFAS cleanup in monetary terms to compare them to the costs of cleanup.

Researchers use various methods to put a dollar value on the cost of low-weight and preterm births based on their higher medical bills, lower subsequent health and decreased lifetime earnings.

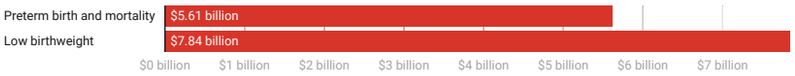
We used the New Hampshire data and locations of PFAS-contaminated sites in 11 other states with detailed PFAS testing to estimate costs from PFAS exposure nationwide related to low birth weight, preterm births and infant mortality.

The results are eye-opening. We estimate that the effects of PFAS on each year's low-weight births cost society about US$7.8 billion over the lifetimes of those babies, with more babies born every year.

We found the effects of PFAS on preterm births and infant mortality cost the U.S. about $5.6 billion over the lifetimes of those babies born each year, with some of these costs overlapping with the costs associated with low-weight births.

Estimated annual costs of PFAS harm to babies

A study estimated the annual cost to society of the harm PFAS causes through preterm births, infant mortality and low birth weights.



Preterm birth and mortality estimates are combined

Chart: The Conversation, CC-BY-ND • Source: Robert Baluja, et al., 2025 • Get the data • Embed • Download image • Created with Datawrapper

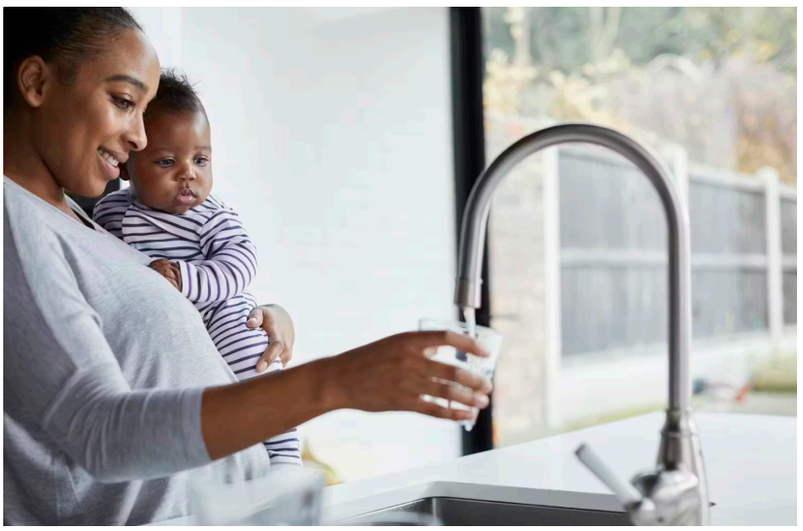
An analysis produced for the American Water Works Association estimated that removing PFAS from drinking water to meet the EPA's PFAS limits would cost utilities alone $3.8 billion on an annual basis. These costs could ultimately fall on water customers, but the broader public also bears much of the cost of harm to fetuses.

We believe that just the reproductive health benefits of protecting water systems from PFAS contamination could justify the EPA's rule.

Treating PFAS

There is still much to learn about the risks from PFAS and how to avoid harm.

We studied the health effects of PFOA and PFOS, two "long-chain" species of PFAS that were the most widely used types in the U.S. They are no longer produced in the U.S., but they are still present in soil and groundwater. Future work could focus on newer, "short-chain" PFAS, which may have different health impacts.



If the water utility isn't filtering for PFAS, or if that information isn't known, people can purchase home water system filters to remove PFAS before it reaches the faucet. Compassionate Eye Foundation/David Oxberry via Getty Images

PFAS are in many types of products, and there are many routes for exposure, including through food. Effective treatment to remove PFAS from water is an area of ongoing research, but the long-chain PFAS we studied can be removed from water with activated carbon filters, either at the utility level or inside one's home.

Our results indicate that pregnant women have special reason to be concerned about exposure to long-chain PFAS through drinking water. If pregnant women suspect their drinking water may contain PFAS, we believe they should strongly consider installing water filters that can remove PFAS and then replacing those filters on a regular schedule.

Public health | Economics | Health | Contamination | Chemicals | New Hampshire | Water supply | Infants | Preterm birth | Low birth weight babies | PFAS | Infant mortality rates | PFAS in drinking water

30%

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UNIVERSITY of ROCHESTER MEDICAL CENTER

RESEARCH

Forever Chemicals, Lasting Effects: Prenatal PFAS Exposure Shapes Baby Immunity

Jul. 23, 2025

New research reveals that tiny amounts of PFAS—widely known as “forever chemicals”—cross the placenta and breast milk to alter infants’ developing immune systems, potentially leaving lasting imprints on their ability to fight disease.

University of Rochester Medical Center (URMC) researchers tracked 200 local healthy mother–baby pairs, measuring common PFAS compounds in maternal blood during pregnancy and then profiling infants’ key T-cell populations at birth, six months, and one year. By age 12 months, babies whose mothers had higher prenatal PFAS exposure exhibited significantly fewer T follicular helper (Tfh) cells—vital coaches that help B cells produce strong, long-lasting antibodies—and disproportionately more Th2, Th1, and regulatory T cells (Tregs), each linked to allergies, autoimmunity, or immune suppression when out of balance.

“This is the first study to identify changes in specific immune cells that are in the process of developing at the time of PFAS exposure,” said Kristin Scheible, MD, an associate professor of Pediatrics and Microbiology & Immunology at URMC and lead author of the study, which appears in the journal *Environmental Health Perspectives*. “Identification of these particular cells and pathways opens up the potential for early monitoring or mitigation strategies for the effects of PFAS exposure, in order to prevent lifelong diseases.”

What It Means for Vaccines, Allergies, and Autoimmunity

Tfh cell depletion helps explain previous findings that higher PFAS levels in children correlate with weaker vaccine responses to tetanus, measles, and other routine immunizations. Conversely, the uptick in Th2 and Treg cells can predispose to allergic inflammation or dampened defenses, while excess Th1 activity raises concerns about future autoimmune conditions such as juvenile arthritis or type 1 diabetes.

“The cells impacted by PFAS exposure play important roles in fighting infections and establishing long-term memory to vaccines,” said Darline Castro Meléndez, PhD, a researcher in Scheible’s lab and first author of the study. “An imbalance at a time when the immune system is learning how and when to respond can lead to a higher risk of recurrent infections with more severe symptoms that could carry on through their lifetime.”

Minimizing PFAS Exposure

Although Rochester’s drinking water meets current safety standards, PFAS lurks in numerous consumer products—from nonstick cookware and food packaging to stain-resistant fabrics and personal care items. The study’s mothers had relatively low PFAS blood levels compared to other regions, yet the immune shifts were pronounced even in this small sample.

While not all environmental exposures can be avoided, families can reduce PFAS contact during critical windows of fetal and infant immune development. “Use water filters, minimize cooking in damaged nonstick pans, switch to alternatives like stainless steel or cast iron, and store food in glass or ceramic containers,” said Scheible. “Small steps can help lower the cumulative burden of exposure.”

The team plans a longer follow-up to determine whether these early T-cell imbalances persist into toddlerhood and whether they translate into more infections, allergies, or autoimmune diseases. Measuring PFAS in infants directly and unraveling the molecular underpinnings of these immune disruptions are key objectives for future research.

Additional authors include Nathan Laniewski, Todd Jusko, Xing Qiu, Paige Lawrence, Jessica Brunner, Meghan Best, Allison Macomber, Alena Leger, Kurunthachalam Kannan, Richard Kermit Miller, and Thomas O’Connor with URMC, and Zorimar Rivera-Nunez and Emily Barrett with Rutgers University. The research was supported with funding from the National Institute of Allergy and Infectious Diseases, the National Institute of Environmental Health Sciences, the National Institute of Child Health and Human Development, the National Center for Advancing Translational Sciences, and the University of Rochester Clinical and Translational Sciences Institute.

PFAS: What You Need to Know

URMC researchers share what they know about the chemicals and how they impact our lives.

Learn More

Tags

autoimmune disease children pediatrics infectious diseases faculty

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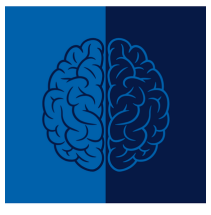

Researchers Find “Forever Chemicals” Impact the Developing Male Brain

PFAS: What You Need to Know

Halting the Rise of Parkinson’s

EPA Approves Four New Pesticides That Qualify as PFAS

Despite MAHA promises to reduce chemical exposures, experts warn the Trump administration is approving a wave of 'frightening' pesticides.

BY LISA HELD SEPTEMBER 8, 2025

Farm workers spray chemicals at the edge of a field bordering homes near Bakersfield, California. (Photo credit: David McNew/Getty Images)

In April, Secretary of Agriculture Brooke Rollins and Secretary of Health and Human Services (HHS) Robert F. Kennedy Jr. went to Texas to tour farms and agriculture research facilities and learn "how America's farmers are working to Make America Healthy Again," according to the U.S. Department of Agriculture (USDA) press release.

During a press conference at Sawyer Farms, a local news reporter told the duo that Texas ranchers are worried about "forever chemical" contamination caused by biosolids used for fertilizer and asked what the Trump administration was doing about it. Because they do not break down, the chemicals accumulate in the environment and can cause serious health harms.

Both Rollins and Kennedy said they were concerned about farm soils being contaminated with the chemicals, called per- and polyfluoroalkyl substances, or PFAS—commonly referred to as forever chemicals. "We want to end the production of PFAS," Kennedy said. "Ultimately, I think that's what we have to do. There's a lot of pressure on the industry now to stop using it."

It wasn't clear which industry Kennedy was referring to, but the pesticide industry, in fact, is moving in the opposite direction—with the help of the Trump administration that Kennedy serves in. Between April and June of this year, the Environmental Protection Agency (EPA) proposed the approval of four new pesticides that qualify as PFAS based on a definition that is commonly used around the world and supported by experts.

"What we're seeing right now is the new generation of pesticides, and it's genuinely frightening," said Nathan Donley, the environmental health science director at the Center for Biological Diversity, who published a paper last year showing pesticides are increasingly fluorinated. Fluorination is the process that creates PFAS. "At a time when most industries are transitioning away from PFAS, the pesticide industry is doubling down. They're firmly in the business of selling PFAS."

Because the EPA uses a different, narrower definition of PFAS, the agency does not categorize the new pesticides as falling into that category. And based on their chemical structure, they are likely not as persistent or harmful as the widely used PFOS and PFOA that have wreaked havoc on farms to date. But they still are likely to persist for decades or even centuries, and Americans are already being widely exposed to them. And experts say the approvals come at a time when the administration is also rolling back other policies that were beginning to address all forever chemical contamination in the food supply.

On August 13, Public Employees for Environmental Responsibility (PEER), a federal environmental policy watchdog organization, sent Kennedy a petition asking the Make America Healthy Again (MAHA) Commission to take several concrete actions on forever chemicals.

PEER recommends that the EPA adopt the broader, widely recognized definition of PFAS, and then ban the use of pesticides that contain them. The organization also wants the Trump administration to stop the application of fertilizers that are often contaminated with PFAS. While Biden's EPA released an initial assessment of PFAS in fertilizer made from biosolids in January, Republicans in Congress recently tried to stop that assessment from being finalized or used to create future regulations.

PEER also wants the agency to reinstate the limits on PFAS in drinking water that it rolled back in May. While many of the actions don't fall under Kennedy's purview, Rollins and EPA Administrator Lee Zeldin are also members of the MAHA commission, and they could make headway on these changes.

"This administration is incredibly hypocritical, and we wanted to point that out to them," said Kyla Bennett, the science policy director at PEER. "The MAHA Commission is claiming that PFAS is dangerous, and we're just pointing out to them three very simple things that they could do to get PFAS out of our food."

An EPA spokesperson ignored a detailed list of questions from Civil Eats related to the proposed pesticide approvals and instead sent a broad statement that included a link to a list of actions Zeldin announced in April to "combat PFAS contamination." The spokesperson said that the administration's decision to overturn the drinking water standards for four PFAS was based on a "regulatory error" during the Biden administration and that the current EPA is starting a new review to reconsider the limits.

HHS did not respond to a request for comment.

Four New Forever Pesticides

In May, Zeldin announced structural changes at the EPA. In addition to cutting some offices and establishing new departments, he shifted more than 130 staff members to the Office of Chemical Safety and Pollution Prevention (OCSPP) "to work directly on the backlog of over 504 new chemicals in review," an action high on the pesticide industry's wish lists.

Under the Trump administration, the OCSPP is being run by three industry insiders. Nancy Beck, formerly an executive at the American Chemistry Council, who previously pushed the EPA to weaken rules on PFAS in consumer products; Lynn Ann Dekleva, a former DuPont executive; and Kyle Kunkler, who has lobbied against pesticide regulations for the American Soybean Association.
Over the past several months, decisions on new chemicals have picked up speed, including on those with potential PFAS characteristics.

Back in April, the agency proposed approving a Syngenta chemical that targets pests called nematodes for crops including Romaine lettuce and soybeans.

Then, in June, it proposed three more approvals in rapid succession: an herbicide made by Bayer for corn and soybeans; a Syngenta field-crop insecticide that can be applied as a seed treatment; and an herbicide from BASF for oranges, apples, peanuts, and other crops.

At the Center for Biological Diversity, Donley and his team analyzed all four and determined that, based on their chemical structure, all are PFAS, according to the definition created by the Organisation for Economic Co-operation and Development (OECD).

That worries Donley because, he said, the definition was based on "the chemical components that make something incredibly persistent." While the new pesticides are shorter-chain molecules compared to the other longer-chain molecules, they could still stick around in the environment for decades or even centuries due to their durable carbon-fluorine bonds and can break down into other chemicals like trifluoroacetic acid (TFA) that also persist.

"All PFAS are persistent. That is one of the things that they all have in common," PEER's Bennett said.

Syngenta and BASF did not respond to questions about the new chemicals qualifying as PFAS and whether that should prompt concerns around persistence or potential human health impacts. A Bayer spokesperson sent an emailed statement that pointed to the fact that its new herbicide, called diflufenican, is "not a PFAS substance" according to the EPA.

"We stand behind the safety of our products, which have been tested extensively and thoroughly reviewed by regulators," the statement read. "Diflufenican will be an important weed-control tool for farmers and has been thoroughly reviewed by the U.S. Environmental Protection Agency (EPA) to ensure the product can be used safely for people and the environment when they are used according to label instructions."

In January, industry trade associations CropLife America and Responsible Industry for a Sound Environment (which operate under the same federally registered nonprofit) also submitted comments that provide insight into the industry's broader perspective on the issue.

In a letter regarding new rules Maine is implementing that will ban products containing PFAS, executives argued against the use of the broader OECD definition of PFAS currently adopted by the state. That definition "disregards the remarkably different physical, chemical, and

biological properties that shape the potential human and ecological risk profiles of chemistries that meet that definition."

They also emphasized that when the EPA approves a new product, it must determine the pesticide will not cause "unreasonable adverse effects" to the environment or human health when used according to the label. Finally, the executives wrote, "the use of PFAS in certain pesticides is essential to their function."

Demands for More Research and a Common Definition

Experts say that these new short-chain PFAS are unlikely to be as dangerous to human health as the longer-chain chemicals. The shorter the chain, the shorter the time they likely stay in the human body.

But new chemicals do not have as much scientific data on them, Donley said. "We have a little bit here and there that says maybe they're safe," he said. "But eventually, more science is going to come out." Studies have shown the shorter-chain PFAS are already prevalent inside homes and bodies in the U.S. And because of their potential to persist in the environment, by the time we learn about their dangers, it may be too late.

"If you've got something that sticks around for generations, then any new science that comes out in the next two years or five years or 10 years saying this stuff is more dangerous than we thought, it's irreversible," he said. "We estimate we're releasing about 30 million pounds of short- and ultra-short-chain pesticide PFAS right now each year in the U.S., and we still have very little idea of what is happening to them in the environment and what their true toxicities are."

To make a similar point, Bennett gave the example of GenX, a PFAS that DuPont introduced in 2009 as a safer replacement for PFOA in commercial products.

DuPont dumped the chemical into North Carolina's Cape Fear River, leading to devastating contamination that affected millions of people. It is now clear that GenX requires long periods of time to break down, and the chemical is associated with serious health effects, including liver problems and cancer. In May, the EPA eliminated its first limits on GenX in drinking water, set during the Biden administration, and is currently re-reviewing them.

"One thing that EPA keeps forgetting is that the absence of evidence is not the evidence of absence," Bennett said. "In other words, just because we don't have the studies and the data doesn't mean it's safe. It means we just don't know yet."

Given there is evidence pointing to potential health risks and environmental persistence, she said, the EPA should err on the side of caution.

But this "precautionary principle," much touted by MAHA supporters, doesn't square with the Trump administration's broader deregulatory push.

Truly addressing PFAS in the food system, Bennett said, would involve the EPA first adopting the broader definition set by the OECD and regulating those chemicals as a class. That kind of policy would end the registration of persistent, harmful pesticides and even lead to safer drinking-water standards.

Hearing Kennedy, a member of the administration, acknowledging the chemicals' harms made her angry, she said. "You know it's dangerous to people, especially children," she said. "If they're spraying it on our food, it's in our water. What are you doing to stop it? The answer is nothing. They're doing nothing to stop it."

Lisa Held is Civil Eats' senior staff reporter and contributing editor. Read more >

FOLLOW:TWITTER

My name is [redacted]. I'm one of the millions of Americans whose lives changed because of natural, plain-leaf kratom.

When I was eight years old, I was hit by a car. The injuries stayed with me, and for fifteen years, I followed the only path I was given: long-term prescription opioids. They kept me functioning, but they didn't give me a life. By 2015, I was worn down and searching for a better way forward.

That's when I discovered natural kratom. I brewed four grams of plain leaf into a cup of tea, and within twenty minutes I felt more clarity, more stability, and more function than I'd had in years. There was no fog, no euphoria, no loss of control, just a steady return to me.

A study of natural kratom leaf confirms this. Safety and Tolerability of Single and Multiple Daily Oral Doses of Dried Kratom Leaf Powder

https://journals.lww.com/drug-monitoring/fulltext/9900/safety_and_tolerability_of_single_and_multiple.435.aspx

That experience pushed me to learn everything I could about this plant. I wanted to understand why it worked the way it did. I began studying chemistry, its traditional use, and the growing body of research. I connected directly with Indonesian farmers who have cultivated and used this plant responsibly for generations.

Over the past decade, I've gained in-depth knowledge of this plant and remain open to discussing its science and real-world use with lawmakers, regulators, and researchers.

Because here is the core truth that must be clearly stated:

Natural kratom and synthetic derivatives are not the same thing.

Plain-leaf kratom contains dozens of naturally occurring alkaloids that exist in balance. When consumed as tea or powder, the human body regulates them. Only a tiny, controlled fraction of mitragynine converts into 7-hydroxymitragynine through normal metabolism, and the body imposes a natural ceiling on that conversion. That metabolic safeguard is a key reason kratom has been used safely for generations in traditional contexts.

Synthetic compounds, including lab-made 7-hydroxymitragynine, MGM-15, MGM-16, and SR-17018, bypass those safeguards entirely. They deliver unregulated pharmacologic spikes, introduce dependency risks, and create safety concerns that do not exist with the natural leaf. These substances are the real source of risk and confusion in today's marketplace, not traditional kratom.

We face a clear choice. We can regulate responsibly based on science and real-world evidence, or we can lump a traditional botanical together with synthetic compounds that have no historical use and no natural regulatory checks.

At the federal level, lawmakers have introduced the **Federal Kratom Consumer Protection Act**, which establishes clear national standards for identity, labeling, purity, manufacturing practices, and age-restricted sales, while preserving adult access to natural, plain-leaf kratom. This framework draws a necessary line between traditional botanical products and synthetic or adulterated substances that do not belong in the same regulatory category.
https://www.congress.gov/bill/118th-congress/senate-bill/3039/text

Millions of Americans use natural kratom tea every day to stay functional, stable, and present for their families: veterans, parents, workers, and people like me who need a way to live without escalating pharmaceutical dependence.

Kratom didn't erase my past, but it gave me a future. I'm asking that we protect access to the natural plant while drawing a clear, enforceable line against synthetic products that do not belong in this conversation.

Please feel free to reach out for any reason. I would welcome the opportunity to discuss natural kratom, my personal experience, and how we can responsibly protect access to natural remedies that have been used safely for thousands of years.

Thank you for your time and consideration,

[redacted]

The Town of South Hadley
Board of Health
Regulation

PROHIBITING THE MANUFACTURING, SALE, AND DISTRIBUTION OF SYNTHETICALLY DERIVED CANNABINOIDS, SYNTHETIC KRATOM UNREGULATED NOVEL INTOXICATING PRODUCTS

A. Authority:

This regulation is promulgated under the authority granted to local Boards of Health by Massachusetts General Laws, Chapter 111, Sections 31 and 122, which authorize Boards of Health to adopt reasonable health regulations and take action to protect the public from sources of disease and health risks.

B. Statement of Purpose

The South Hadley Board of Health recognizes that the sale and distribution of synthetic and unregulated psychoactive substances including but not limited to synthetically altered cannabinoids and kratom products pose an emerging threat to public health, particularly among youth and vulnerable populations. These substances are often: manufactured without oversight, sold without proper labeling, dosage guidelines, or ingredient transparency, associated with unpredictable or harmful health effects, readily available in convenience stores, vape shops, and online with no safeguards.

C. Definitions:

For the purposes of this regulation, the following words shall have the following meanings:

Board of Health: The South Hadley Board of Health and/or its designated agent(s).

Board of Health Agent: Any person designated by the South Hadley Board of Health or the South Hadley Health Department to conduct and enforce the provisions of this regulation. A Board of Health Agent shall have all powers assigned under Massachusetts General Laws, including inspection authority, issuance of orders, and initiation of enforcement actions.

Business Agent: An individual who has been designated by the owner or operator of any establishment to be the manager or otherwise in charge of said establishment.

Employee: Any individual who performs services for an employer.

Employer: Any individual, partnership, association, corporation, trust or other organized group of individuals that uses the services of one (1) or more employee(s).

Kratom: Any part of the plant *Mitragyna speciosa.*

Natural Raw Kratom: Any unadulterated form of the plant *Mitragyna speciosa*, including its leaves (whole, crushed, or powdered), stems, or other plant parts, that have not been chemically altered, synthesized, or had their alkaloid concentrations artificially increased or mixed with any other ingredients.

Synthetically Derived Kratom: Any kratom product that has been altered from its natural plant form through chemical synthesis or the use of synthetic alkaloid analogs or concentrates beyond what occurs naturally in the plant.

Synthetically Derived Cannabinoid: Any cannabinoid that is altered by a chemical reaction that changes the molecular structure of any natural cannabinoid derived from the plant Cannabis to another cannabinoid found naturally in the plant Cannabis. Synthetically Derived Cannabinoids include but are not limited to delta-8 and delta-10.

Person: Any individual, firm, partnership, association, corporation, company, or organization of any kind, including, but not limited to an owner, operator, manager, proprietor, or person in charge of any establishment, business, cultivation property or retail store.

Permit Holder: Any person or entity that applies for and receives or any person who is required to apply for a permit with the South Hadley Health Department.

Retail Establishment: Any store, kiosk, gas station, vape shop, convenience store, smoke shop, or other physical location in which engaged in the sale of consumer goods.

Unregulated Synthetic Products: Any psychoactive substance not approved by the U.S. Food and Drug Administration FDA or Massachusetts Cannabis Control Commission and not specifically authorized for sale under Massachusetts law and not exempted under this regulation including novel psychoactive substances (NPS) or "legal highs."

Unregulated Novel Intoxicating Products: Any substance, compound, or mixture, whether natural, synthetic, or semi-synthetic, that is intended for human consumption or ingestion, inhalation, absorption, or any other method of introduction into the human body, that:

1. Has psychoactive, intoxicating, or mood-altering effects;
2. Is not approved by the U.S. Food and Drug Administration for such use; and
3. Is not otherwise regulated or scheduled under Massachusetts or federal law.

This definition includes, but is not limited to, novel cannabinoids, synthetic opioids, synthetic stimulants, synthetic hallucinogens, and any chemical analogs or derivatives thereof, except for those lawfully prescribed or otherwise legally authorized.

D. Prohibition

No person, business, or other entity shall sell, offer for sale, distribute, or otherwise provide for human consumption any of the following within the Town of South Hadley:

1. **Synthetic Kratom** - Any kratom products that contain synthetic or semi-synthetic alkaloids, chemical analogs, or derivatives not naturally occurring in the kratom plant (*Mitragyna speciosa*).
2. **Synthetically Derived THC** - Any tetrahydrocannabinol (THC) or THC analog that is produced through chemical synthesis or conversion from hemp-derived cannabidiol (CBD) or other cannabinoids, except for those products that are lawfully regulated by the Commonwealth of Massachusetts.
3. **Unregulated Novel Intoxicating Products** - As defined in Section "Definitions", any natural, synthetic, or semi-synthetic substance, compound, or mixture with psychoactive, intoxicating, or mood-altering effects, not approved by the U.S. Food and Drug Administration, and not otherwise regulated or scheduled under Massachusetts or federal law.

E. Exemptions

This regulation does **not** apply to:

1 Cannabis products sold through state-licensed medical, or adult-use dispensaries regulated by the Massachusetts Cannabis Control Commission.

2 Raw, unaltered kratom leaf or powder with no synthetic additives, provided it is properly labeled with a full list of ingredients clearly displayed on the package, serving size and dosing recommendations are included and does not violate state or federal law.

F. Violations:

1. It shall be the responsibility of the establishment, permit holder and/or their business agent, and not their employee(s), to ensure compliance with all sections of this regulation.
   In the case of a violation, the violator shall receive:

   I. **First offense**: A three-hundred-dollar ($300.00) fine shall be issued.

II. **Second offense**: A three-hundred-dollar ($300) fine and a fourteen (14) day suspension of BOH retail permits to operate.

III. **Third offense:** A three-hundred-dollar ($300.00) fine and thirty (30) day suspension of BOH retail permits to operate.

IV. **Subsequent offenses**: A three-hundred-dollar ($300.00) fine and as determined by the South Hadley Board of Health, after a hearing, may permanently revoke any or all BOH permits including but not limited to retail food and tobacco permits.

2. Every day that a violation exists shall be deemed a separate offense. Separate but simultaneous violations shall be treated as separate violations. Multiple permit suspensions may not be served concurrently.

3. Any person who receives notice of a violation of this regulation may request a hearing before the Board. The request must be made in writing and filed within seven (7) days of the date the violation was received.

4. The authority to inspect establishments for compliance and to enforce this regulation shall be held by the South Hadley Board of Health and its designated agent(s).

5. Any person may register a complaint pursuant to this regulation to initiate an investigation and enforcement with the South Hadley Board of Health and its designated agent(s).

6. Before suspending or revoking any permit issued by the Board of Health, including but not limited to, a permit to sell tobacco or retail products, the Board shall provide notice of the intent to suspend or revoke such permit(s), which notice shall contain the reasons therefor and shall establish a time and date for a hearing, to be held no earlier than seven (7) days from the date of the notice. The permit holder or their designee shall have the opportunity to be heard and shall be notified of the Board of Health's decision and the reasons therefore in writing. If after a hearing, the Board of Health finds that a violation of this regulation occurred, the Board of Health shall suspend or revoke the subject permit. For purposes of such suspensions or revocations, the Board of Health shall make the determination notwithstanding any separate criminal or non-criminal proceedings concerning the same offense. Upon suspension or revocation of a permit, all permitted products must be removed from the retail establishment. Failure to remove such products shall constitute a separate violation of this regulation.

7. Failure to comply with the terms of a permit suspension imposed pursuant to this regulation may subject the permit holder to an additional suspension of all Board of Health issued permits for thirty (30) consecutive business days.

G. Non-Criminal Disposition:
Whoever violates any provision of this regulation may be penalized by the non-criminal metho of disposition as provided in Massachusetts General Laws, Chapter 40, Section 21D.

H. **Separate Violations:** Each day any violation exists shall be deemed to be a separate offense.

I. Enforcement: Enforcement of this regulation shall be by the South Hadley Board of Health or its designated agent(s). The Board of Health may enforce these regulations or enjoin violations thereof through any lawful process, and the election of one remedy by the Board of Health shall not preclude enforcement through any other lawful means. Any resident who desires to register a complaint pursuant to the regulation may do so by contacting the South Hadley Board of Health or its designated agent(s) and the Board shall investigate.

J. Severability:

If any provision of this regulation is declared invalid or unenforceable, all other provisions shall not be affected thereby but shall be in full force and effect.

K. Effective Date:

This regulation shall take effect on _____.

_____

_____

_____

_____

_____

Dated: _____

Appendix: Additional Information on Synthetic Cannabinoids & Synthetic Kratom

Whereas, hemp is defined as "the plant Cannabis sativa L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis."[1]

Whereas, tetrahydrocannabinol (THC) is the chemical responsible for most of marijuana's psychological effects.[2]

Whereas, adult-use marijuana can be distinguished from hemp because it contains more than 0.3 percent (0.3%) delta-9 THC concentration, which is a naturally occurring cannabinoid.

Whereas, delta-8, delta-10, and other forms of THC are isomers of delta-9 and, except for trace amounts, are not found naturally in the plant cannabis, but are instead synthetically produced in laboratories.[3]

Whereas, in Massachusetts, adult-use marijuana is legal, but products containing delta-8, delta-10, and other synthetically derived cannabinoids are not.[4]

Whereas, delta-8 and similar synthetically derived products are psychoactive.[5]

Whereas, Kratom, a tree-like plant indigenous to Southeast Asia, produces stimulant and sedative effects when orally ingested in tablet, capsule, or extract form. Kratom leaves can be chewed or dried and ingested as a tea. Use of Kratom can lead to psychotic symptoms,

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[1] Implementation of Agricultural Improvement Act of 2018, 85 Fed. Reg. 51,640 (Aug. 21, 2020).

[2] Alina Bradford, *What is THC?*, LIVESCIENCE (May 18, 2017), available at https://www.livescience.com/24553-what-is-thc.html.

[3] Kristina Etter, *I Stand Corrected: The Truth About Delta-8 THC*, MEDIUM (March 17, 2021), available at https://medium.com/seed-stem/i-stand-corrected-the-truth-about-delta-8-thc-e8085725ed9e.

[4] MASS. DEPT. OF AGRIC. RES., HEMP IN MASSACHUSETTS: FAQS, available at https://www.mass.gov/guides/hemp-in-massachusetts-faqs#-is-it-legal-to-manufacture-delta-8-thc-from-hemp?-(last visited Feb. 13, 2023).

[5] See U.S. FOOD & DRUG ADMIN., 5 THINGS TO KNOW ABOUT DELTA-8 TETRAHYDROCANNABINOL – DELTA-8 THC, available at https://www.fda.gov/consumers/consumer-updates/5-things-know-about-delta-8-tetrahydrocannabinol-delta-8-thc (last visited February 13, 2023).

and psychological and physiological dependence because it contains mitragynine and 7-hydroxymitragynine, two major psychoactive ingredients.[6]

Whereas, neither synthetic, hemp-derived products like delta-8 nor Kratom are regulated by the federal government or in Massachusetts.

Whereas, the Massachusetts Supreme Judicial Court has held that "[t]he right to engage in business must yield to the paramount right of government to protect public health by any rational means."[7]

Whereas, the United States Food & Drug Administration has not approved "any prescription or over-the-counter drug products containing kratom or its two main chemical components, mitragynine and 7-hydroxymitragynine."[8]

Therefore, in furtherance of its mission to protect, promote, and preserve the health and well-being of its residents, and pursuant to the authority granted to the Northampton Board of Health pursuant to G. L. c. 111, §31, the Board of Health enacts this Regulation Prohibiting the Manufacturing, Sale, and Distribution of Synthetically Derived Cannabinoids and Kratom.

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[6] DRUG ENFORCEMENT ADMIN., GET SMART ABOUT DRUGS, available at http://www.getsmartaboutdrugs.gov (last visited February 13, 2023).

[7] Druzik v. Bd. of Health of Haverhill, 324 Mass. 129, 139 (1949) (citing Lawrence v. Bd. of Registration in Med., 239 Mass. 424, 428 (1921)).

[8] FDA. (2025, July 29). FDA and Kratom. U.S. Food and Drug Administration. https://www.fda.gov/news-events/public-health-focus/fda-and-kratom