Massachusetts
Toxics Use Reduction

TURA Advisory Committee
January 16, 2025

MassDEP

OTA
OFFICE OF TECHNICAL
ASSISTANCE & TECHNOLOGY

TURI
TOXICS USE REDUCTION INSTITUTE
UMASS LOWELL

Format for Questions and Discussion

- Advisory Committee members may ask questions at any time by raising hand
- Non-Advisory Committee members will be given an opportunity to participate **after** the Advisory Committee member discussion at the end of each agenda item; comments limited to 3 minutes if any other attendees are waiting to speak
- Raise hand function will be used
- If we run out of time for attendee questions, please email questions to the TURA Program Administrative Council Executive Director, Tiffany Skogstrom (tiffany.skogstrom@mass.gov)

How to Ask Questions

Use Zoom function to raise your hand for comments or questions.

To access the "Raise Hand" function, click "Participants" at the bottom of your screen, and then click the "Raise Hand" button that appears under the list of participants. This will notify the host that you have a question or comment.

Agenda

- Introductions and Welcome
- Approval of October 17, 2024 Meeting Minutes
- Nine PFAS added to US EPA Toxics Release Inventory (TRI)
- TURA Program Carbon Nanotubes and Carbon Nanofibers
- TURA Fees Background and Status
- TURA Program Update
- Adjourn

Note: Public comments/questions will be held until opened for general discussion

Introductions and Welcome

October 17, 2024 Meeting Minutes Vote

Approval of October 17, 2024 meeting minutes

Nine PFAS added to US EPA Toxics Release Inventory (TRI)

US EPA Changes to TRI Reporting for PFAS

Toxics Release Inventory (TRI) Program

Providing Pollution Prevention and Toxic Chemical Release Information

In October 2024, EPA proposed to add 16 individual PFAS and 15 PFAS categories representing over 100 individual PFAS as reportable under TRI.

- As proposed, all PFAS in a given category would count towards 100 pound threshold
  - Some previously added PFAS would be reclassified under one of the categories
- Public comment period closed in December
- The rule is also clarifying how PFAS are added to the TRI under the National Defense Authorization Act for Fiscal Year 2020

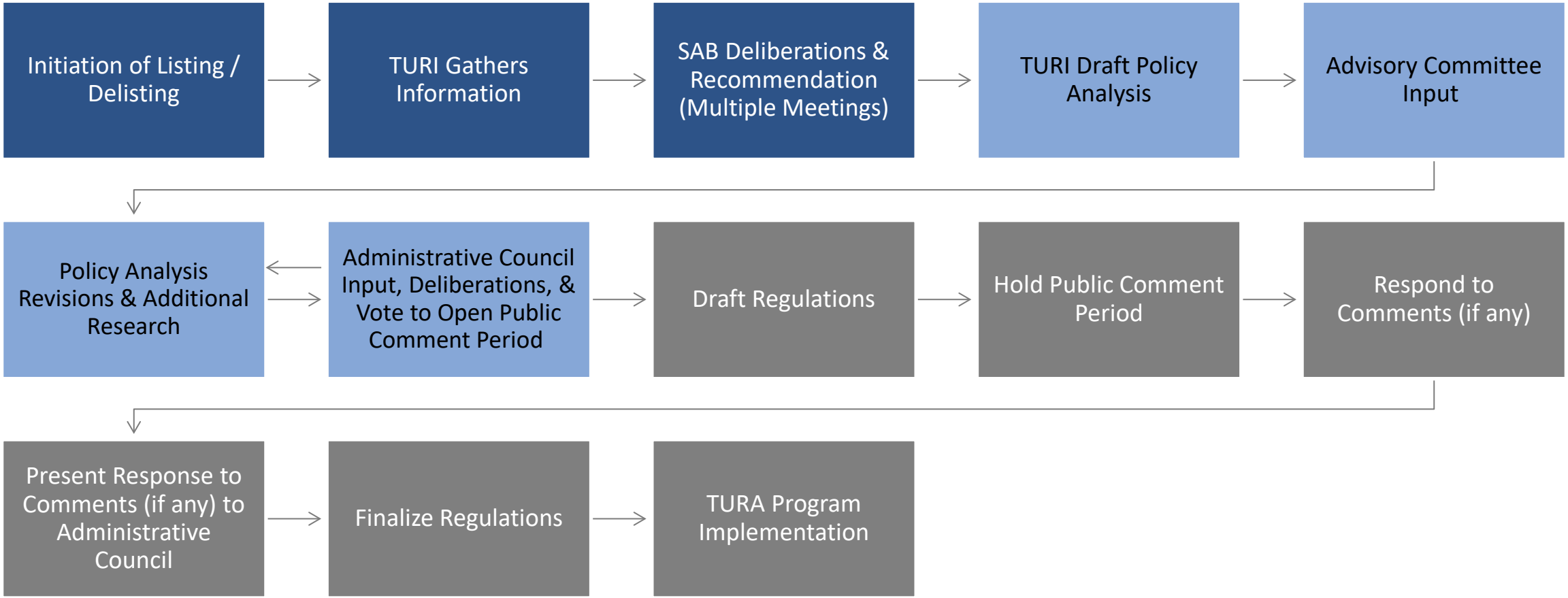
PFAS Tracking and Reporting: TRI and TURA

EPA PFAS Under TRI Guidance

	Report to TRI	TURA tracking starting	Report to DEP	How Reportable	Threshold
TURA Certain PFAS NOL	---------	January 1, 2022	July 1, 2023	As a category	25,000 lbs. mfg'd/ processed; 10,000 lbs. otherwise used
172 TRI/TURA PFAS – 2020	July 1, 2021	January 1, 2021	July 1, 2022	Separately	100 lbs. De minimis exemption no longer applies All PFAS in a given category would count towards 100 pound threshold
Four TRI PFAS – 2021	July 1, 2022	January 1, 2023	July 1, 2024		
Four TRI PFAS – 2022	July 1, 2023				
Nine TRI PFAS – 2023	July 1, 2024	January 1, 2024	July 1, 2025		
Seven TRI PFAS – 2024	July 1, 2025	January 1, 2025	July 1, 2026		
Nine TRI PFAS – 2025	July 1, 2026	Anticipated January 1, 2026	Anticipated July 1, 2027		
(EPA proposed) **Sixteen PFAS and 15 PFAS categories (TRI) – Anticipated 2025**	Anticipated July 1, 2026	Anticipated January 1, 2026	Anticipated July 1, 2027		

TURA Program
Carbon Nanotubes and Carbon Nanofibers

TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Decision Making Steps for Additions to TURA List**



TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Petition**

June 2020

Petition filed by Clean Water Action (CWA) and Public Employees for Environmental Responsibility (PEER) to list Carbon Nanotubes (CNT) and Carbon Nanofibers (CNF) under TURA

- Requested to list Carbon Nanotubes and Carbon Nanofibers as Higher Hazard Substances
- Proposed to include CNTs and CNFs on TURA list as a group
- Requested 100g reporting threshold

TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Recommendation from the TURA Science Advisory Board (SAB)**

TURA Science Advisory Board recommends Multi Walled Carbon Nanotubes, Single Walled Carbon Nanotubes, and Carbon Nanofibers be **added as three distinct categories** to the TURA List of Toxic Substances

- Recommended MWCNT category be listed as HHS
  - Evidence of pulmonary toxicity, lung cancer, mesothelioma and environmental persistence. Concerns for genotoxicity and toxic environmental degradation products.
- Recommended listing SWCNT and CNF as standard categories
  - **SWCNT** - evidence of pulmonary toxicity and environmental persistence. Concerns for reactive oxygen species (ROS) production and DNA damage.
  - **CNF** - evidence of pulmonary toxicity.

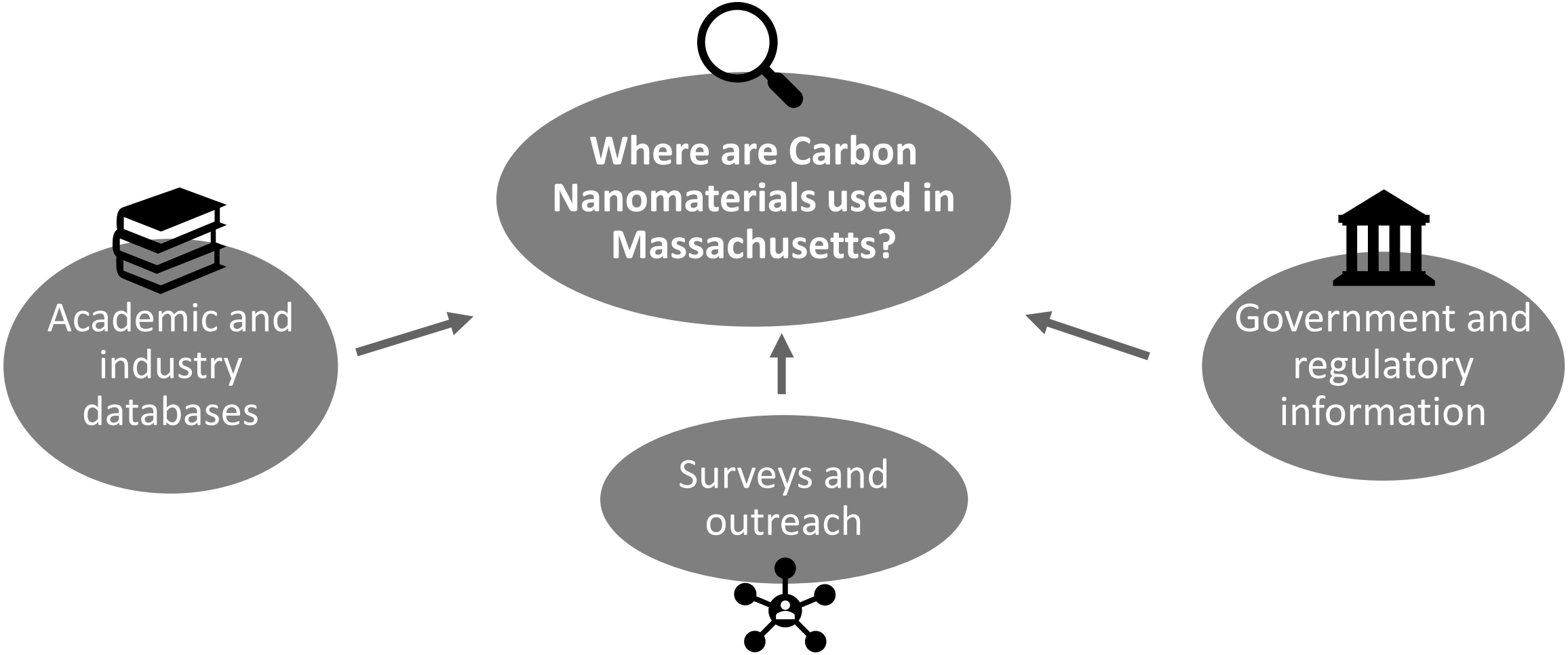
CNT/CNF Hazards focused on by SAB

- **Pulmonary Toxicity**
  - Extensive evidence of pulmonary toxicity including pulmonary inflammation and fibrosis for MWCNT, extending to evidence of carcinogenicity (IARC 2B) and mesothelioma. Solid evidence for SWCNT and CNF.

- **Genotoxicity**
  - MWCNT showed DNA damage and/or micronuclei formation
  - SWCNT showed DNA damage and/or Reactive Oxygen Species (ROS)

- **Environmental Persistence**
  - Solid evidence for MWCNT and SWCNT. No studies for CNF.

TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Potential Use in Massachusetts**



TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Potential Use in Massachusetts**

Over 50 companies identified as potential carbon nanomaterial users across a range of sectors and applications

Industry	*# of potential users*	*Uses*
Electronics and Computing	7	**Electronics** (Field effect transistors, semiconductors, Memory RAMS, Optical Devices) **Computers** (Semiconductors, computer chips, structural pieces, *quantum computers, display panels, touch screens, transistors)
Advanced Materials	4	**Carbon Fiber Flywheel: Storage of Kinetic Energy** (composite rim core) **Drones** (strong and lightweight structural pieces), **Filtration (**Activated Carbon) **Aerospace** (Thrusters) **Specialty Paper Manufacturing** (Activated Carbon and Filter paper)
Batteries	11	**Lithium-Ion Batteries** (Anode materials)
Food Packaging/ Plastics	9	**Structural Pieces** (incorporated into synthetic polymer matrix to provide strength and antimicrobial properties), **Sensors** (Spoilage detection) **Plastics**
Sensor Manufacturers	11	**Gas Sensors** (*Sensing element), **Temperature Sensors** (sensing element), **Pressure Sensors** (sensing element), **Humidity Sensors** (sensing element), **Electrochemical Biosensors** (sensing element)
Sports Equipment Manufacturers	1	**Sports Surfaces/Tracks/Courts** (synthetic rubber)
Biopharmaceutical	10	**Chromatography Columns** (enantioseparation techniques), **Spectroscopy** (1 dimensional systems), **Pharmaceuticals** (sustained -release drugs)
Nanomaterial Manufacturing	3	**Fullerenes** **Fullerene Derivatives** **Carbon Nanotubes**

TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Potential Use in Massachusetts**

Companies exist in MA who could report carbon nanomaterial use should they be added to the TURA list, but information gaps make estimating the exact number of potential filers difficult

Coverage under the TURA statute

- Some companies may be using carbon nanomaterials which are not covered by TURA (e.g. research purposes, non-covered SIC codes)

Thresholds

- Due to the nature of carbon nanomaterials, and their applications, some companies may not be using them in quantities above the TURA reporting thresholds

Other nanomaterials

- The research methodology may have resulted in the identification of companies using other nanomaterials

Changes in operations

- Some companies may have ceased or modified their operations since the research was undertaken

TURA Program Consideration of Carbon Nanotubes and Nanofibers: **Regulatory Review Approach**

Overview of regulations, official guidance and initiatives which cover carbon nanomaterials

International	Federal	State and Local
• OECD - Strategic Programme on Safety Eval. & Risk Assessment • UN - SAICM/GFC Emerging Policy Issue / Issue of Concern • EU - e.g. REACH, Cosmetics legislation; Nanoform Guidance	• TSCA Section 5 (Premanufacturing Notices and Significant New Use Rules) • EPA Recordkeeping Rule • NIOSH Recommended Exposure Limit	• California DTSC Formal Request Letters • Cambridge nanotechnology committee and Berkeley, CA disclosure requirements

Threshold Considerations

- Petition requested 100g reporting threshold
- Regular reporting thresholds are 25,000/10,000 lbs.
- Higher Hazard Substances (HHS) reporting thresholds are 1,000 lbs.
  - MWCNT are currently recommended by SAB to be HHS
- HHS thresholds can be further lowered upon recommendation from TURI and Science Advisory Board

We welcome input on policy considerations regarding the potential lowering of reporting thresholds below 1,000 lbs.

Additional Threshold Considerations

- There are substances on the TURA list with reporting thresholds below 1,000 lbs. These are all EPA PBTs, with thresholds developed by TRI (Lead 100lbs, Mercury 10lbs, Dioxin .1g)
- TURA provides the authority to set a lower-than-standard threshold (Section 9A (D))
- EPA publishes rationales for lowered thresholds but not calculations. Rationales include:
  - **Effects at low doses/concentrations**
  - **Persistence** and bioaccumulation
  - Two tiers distinguishing vPvB vs PB
  - Third tier based on **small use quantity** (dioxins)
  - Balancing industry burden with public Right-to-Know

Additional Threshold Considerations

Threshold considerations are unique for carbon nanomaterials due to the low density of the material, and their use in very small quantities (i.e. research applications, specialty components)

Challenges

- Lack of information on users now in Massachusetts
- Small quantity users may not be covered under typical TURA thresholds
- Development of new thresholds could take time

Discussion

Use zoom function to raise your hand for comments or questions.

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- Advisory Committee members participate FIRST by raising hand
- Non-Advisory Committee members will be given an opportunity to participate AFTER the Advisory Committee member discussion

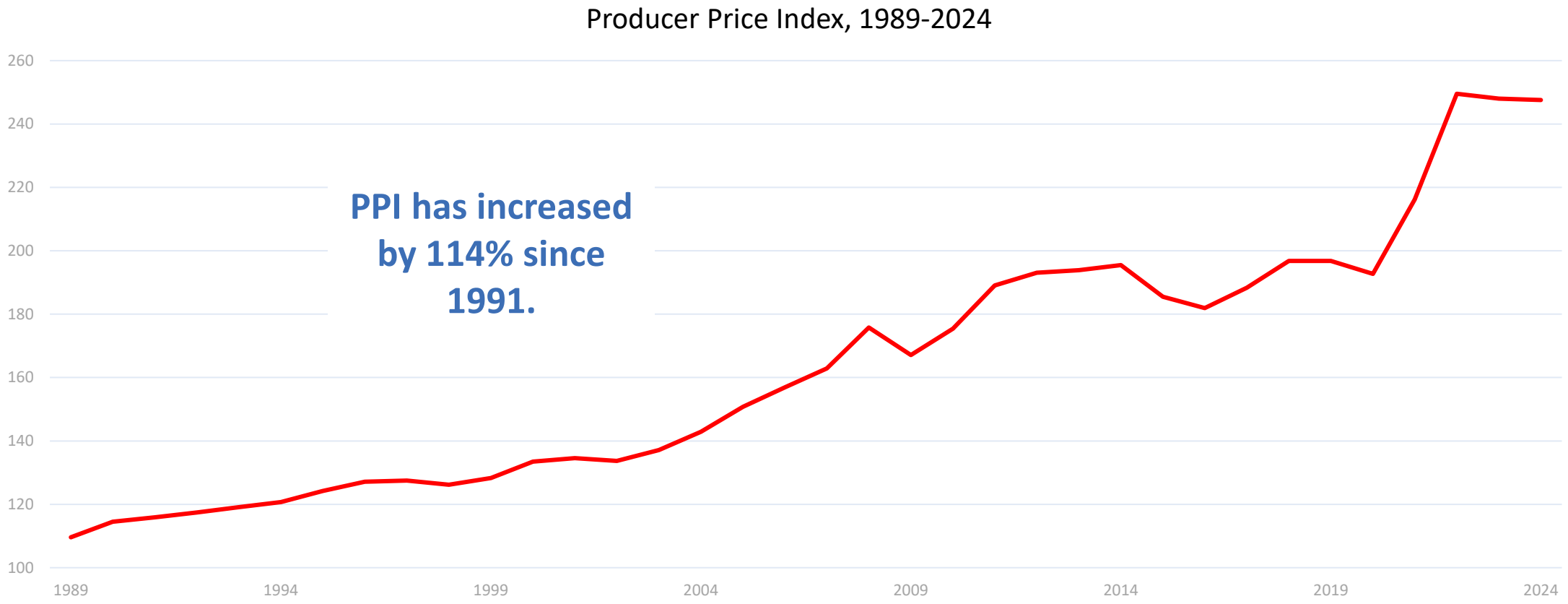
Further comments can be sent to heather@turi.org

TURA Fees Background and Status

TURA Fees: Background

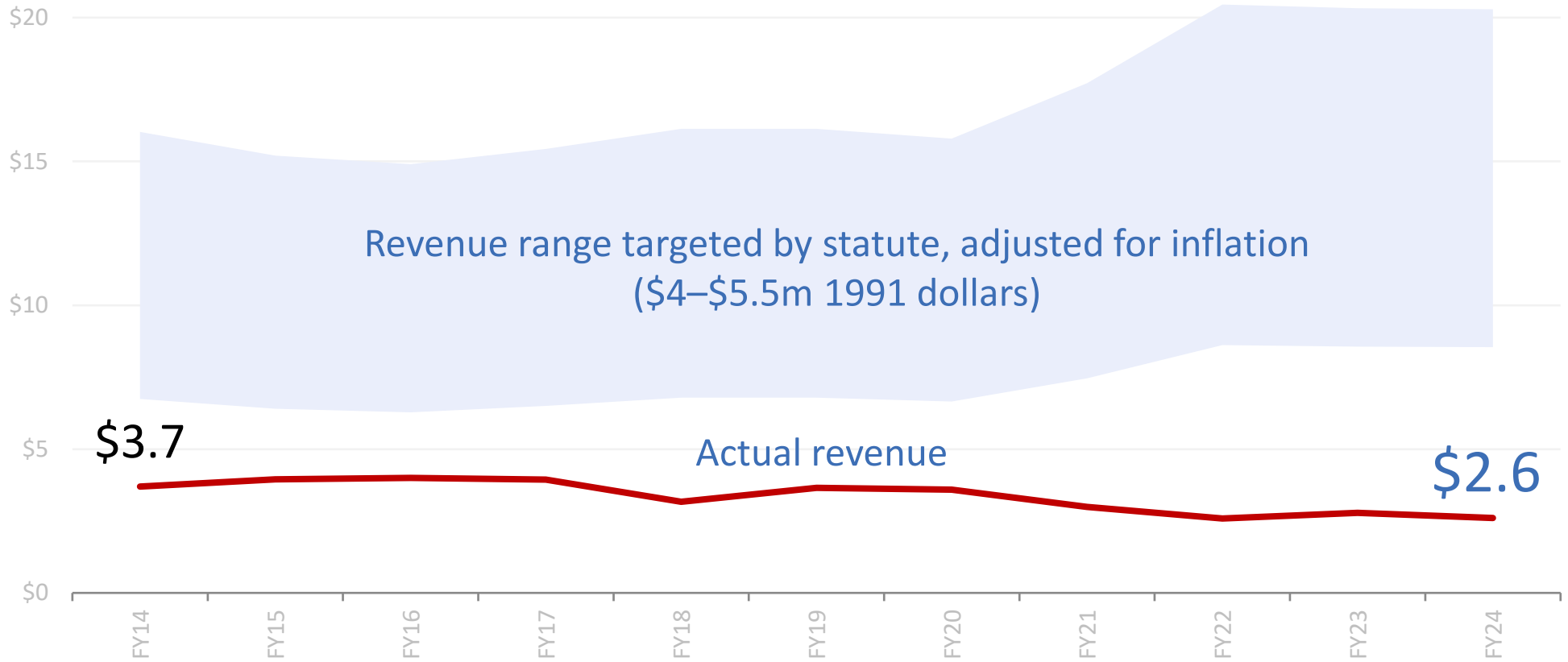
TURA Section 19

"The base fees, additional amount per chemical, and maximum fees shall be adjusted annually to reflect changes in the Producer Price Index".



TURA Fees: Background

Target vs. Actual TURA Program Revenue, 2014–2024



All values shown in millions of 2023 dollars.

2014 Proposal

- Council voted to open public comment on a one-time fee increase to account for part of missed PPI changes, designed to bring program to $4m revenue/year
- Three options (A, B, C) were proposed, all generally built around a 50% increase
  - Council recommended Option B, which limited fee increases on smallest filers. Comments on all 3 options, and on implementation, were invited.
- Response to comments was prepared, but amendment was put on hold indefinitely due to the 2015 regulatory pause (Executive Order 562).
- **If this change had been promulgated and annually adjusted, TURA FY28 revenue would only be about $750,000 below where it would have been if all PPI adjustments had been made since 1991.**

Adjusted Fees by Filer Size

2023 Filer Universe (n=430)	Current Base Fee	Current Maximum	Percent Increase	Adjusted Base Fee	Adjusted Maximum
<10 to <50 (39% of filers)	$1,850	$5,550	Full PPI (114%)	$3,963	$11,890
			2014 proposal (91%)	$3,524	$10,573
<50 to <100 (22% of filers)	$2,775	$7,400	Full PPI (114%)	$5,945	$15,853
			2014 proposal (91%)	$5,286	$14,097
<100 to <500 (33% of filers)	$4,625	$14,800	Full PPI (114%)	$9,908	$31,705
			2014 proposal (91%)	$8,811	$28,194
>500 (6% of filers)	$9,250	$31,450	Full PPI (114%)	$19,816	$67,374
			2014 proposal (91%)	$17,621	$59,913

Per-Chemical Fee (Current: $1,100)	
Percent Increase	Adjusted Fee
Full PPI (114%)	$2,356
2014 proposal (91%)	$2,096

The "2014 proposal" rows show the fees the TURA Program would be collecting today if the 2014 proposal had been promulgated at the time and if annual PPI adjustments had been made.

"Full PPI" refers to an adjustment that would reflect the last 33 years of missed PPI adjustments.

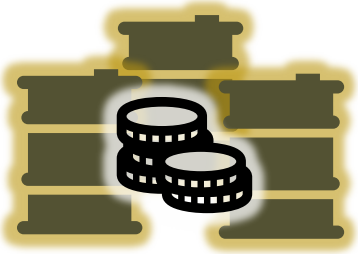
Value of Source Reduction and the Cost of PFAS Crisis

Massachusetts is spending millions of dollars to address existing PFAS contamination in the state, while the TURA Program has insufficient funding for source reduction – and remediating as much PFAS as we currently produce is impossible.

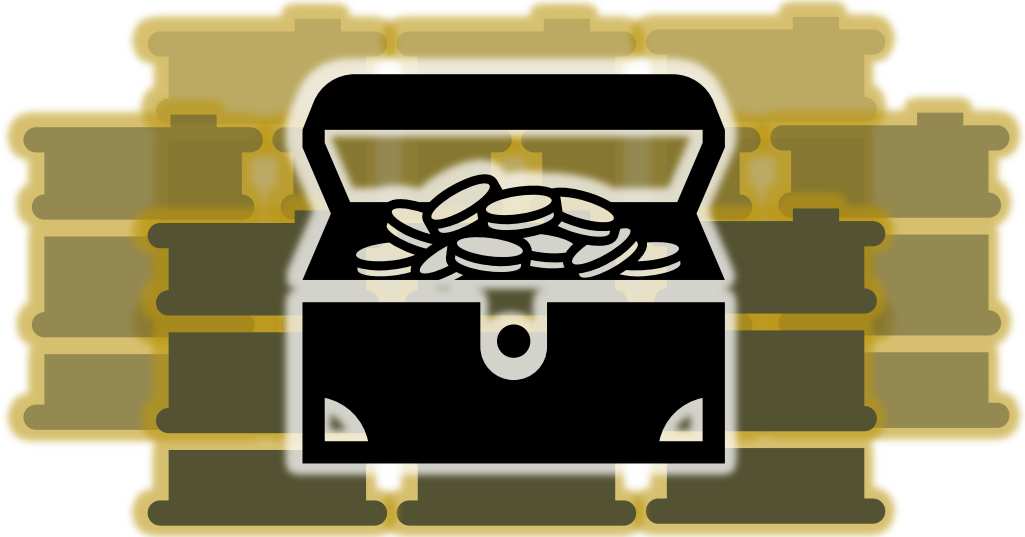
Source reduction prevents tomorrow's contamination, safeguarding health and the environment and protecting Massachusetts companies from future liability.

> "Removing PFAS from the environment at the rate we are adding it now would cost more than the global GDP. Thus, remediation alone cannot manage global PFAS stocks."
>
> Ling (2024)

Source Reduction



Remediation



Ling, A.L. (2024). Estimated scale of costs to remove PFAS from the environment at current emission rates. *Science of The Total Environment*, *918*, 170647. https://doi.org/10.1016/j.scitotenv.2024.170647

Summary of TURA Administrative Council Discussion

The following sentiments were expressed by Council members and/or attendees:

- TURA Program Agencies are using outdated software that is critical to infrastructure – Updating and improvement would benefit of both TURA filers and program staff
- The de-coupling of per-chemical thresholds from the 2006 amendments resulted in a drop in program revenue
- MCTA stated that they do not oppose the Producer Price Index (PPI) increase, as it is written in the statute, however wants to see program changes accompany a fee increase.
- There is general support for expanding the TURA filer universe
- The longer that addressing fee increases takes, the harder it will be for filers to absorb a sudden large fee increase (if fully aligned with current PPI in one action)
- Effort should be made to alleviate administrative burdens on filers

Discussion

TURA Program Update

Spotlight on PFAS: TURA Program Activities

- OTA's PFAS source identification work
  - Coordination with wastewater treatment plants in priority Drinking Water Protection Areas to identify facilities where PFAS may be used
  - Development of PFAS questionnaires for paper, metal finishing, and coatings industries
  - Outreach to metal finishers
  - Supplier Notification Letter for facilities to send to their vendors to identify PFAS in products they may be using
- TURI grant-funded development of PFAS alternatives

TURI PFAS Strategic Priority

Academic Research Grants

- Prof. Nagarajan and Fabric Discovery Center – Continued research on Non-PFAS coatings for textiles
- Prof. Sun and Prof. Chow – Research on non-PFAS food packaging

Community Grants

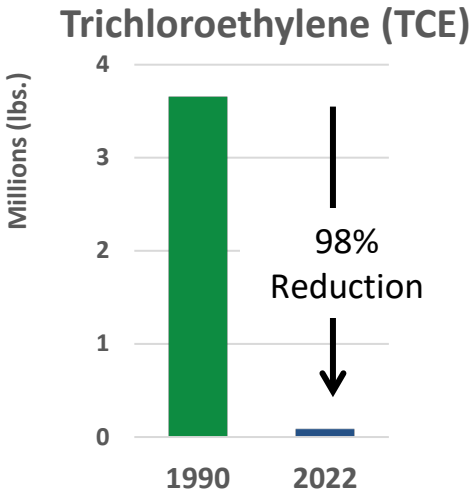
- Silent Spring and Clean Water Fund continue gathering products for testing by UMass Lowell PIGE analytical equipment

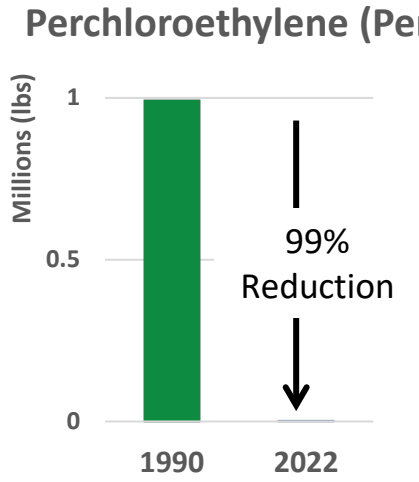
Scientific Publications

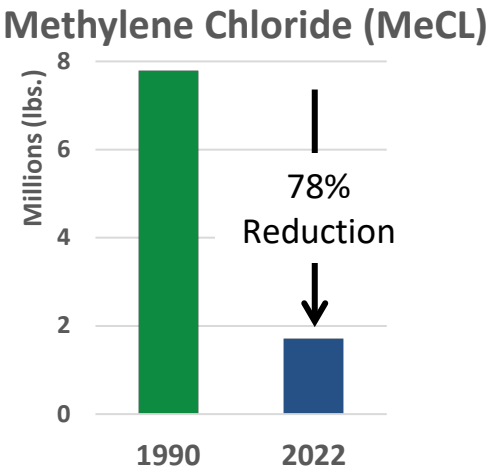
- A Comparative Study of Alkyl Chain Silanes and Poly Dimethyl Siloxane Liquid-like Brushes as PFAS-Free Liquid-Repellent Fabric Coatings
- Impact of HFOs: PFAS and Global Warming

TURI Halogenated Solvents Strategic Priority

TURI's "Drive to Zero" campaign builds upon past TURA successes to reduce the use of these carcinogenic solvents by ramping up support for remaining users in MA to find safer solutions







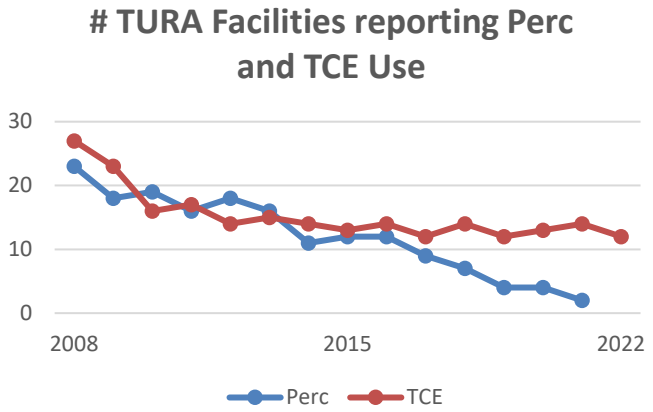
2008/2009

Perc and TCE become Higher Hazard Substances under TURA, lowering reporting threshold and connecting more businesses with TURA services

2008 to 2022

91% Reduction In Perc Users

56% Reduction in TCE Users



2024

EPA issues rules which ban most uses of TCE, Perc and MeCl

TURI Halogenated Solvents Strategic Priority

TURA agencies continue to provide companies with extensive financial and technical support - ensuring they are able to comply with recent EPA bans

Costs of switching away from TCE in industrial cleaning[1]		
Activity	**Employee Time (Hours)**	**Cost ($)**
Research cleaning options	60	7,500
Independent lab testing		4,000
Fine tune equipment and process design	40	8,000
Evaluation of testing	8	1,000

9 Massachusetts businesses currently working with TURI to eliminate halogenated solvent use

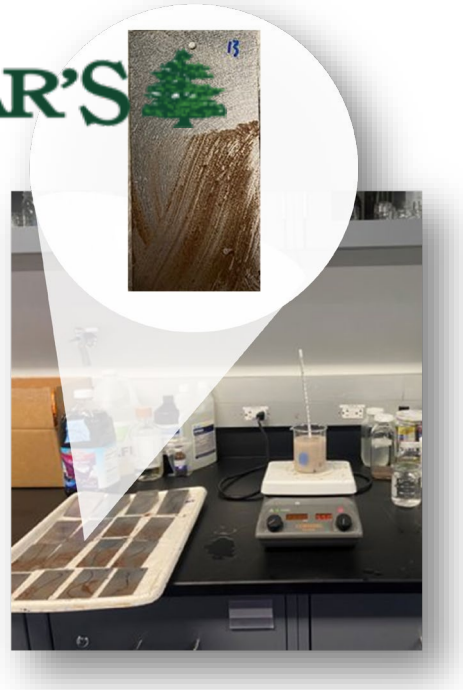
$277,000 Grant money provided by the TURA program to help companies switch away from halogenated solvents since 2020

1000 hours TURI staff time dedicated to helping businesses find safer alternatives to TCE since 2020

1- Barbara and Ed Kanegsberg.*The Real Costs of Changing the Cleaning Process. FinishingandCoating.com. (2023).*

Cleaners and Disinfectants

Conducted trainings to assist craft beverage manufacturers and businesses in identifying and promoting safer alternatives for cleaning, sanitizing, and disinfecting

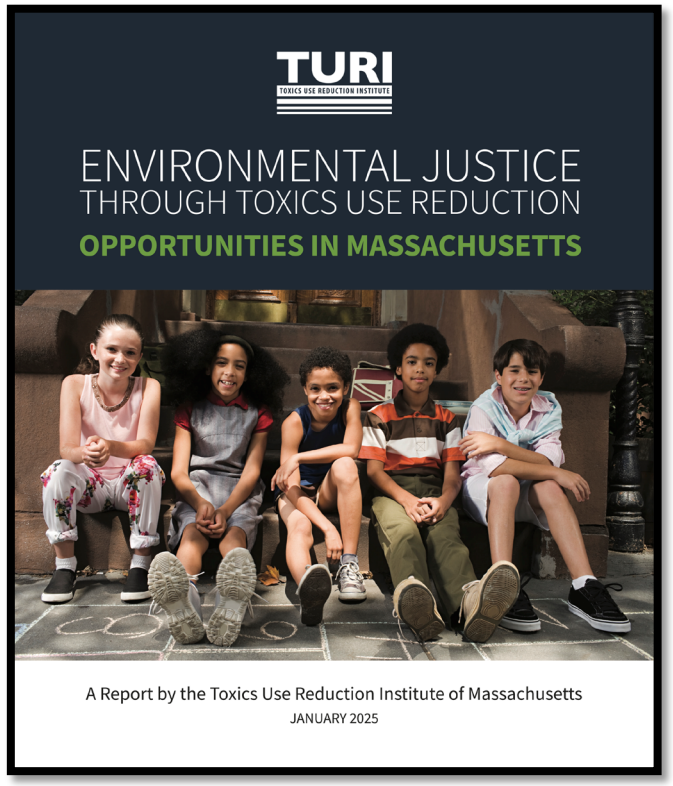


The Toxics Use Reduction Institute (TURI) is recognized as an outstanding Safer Choice Supporter.

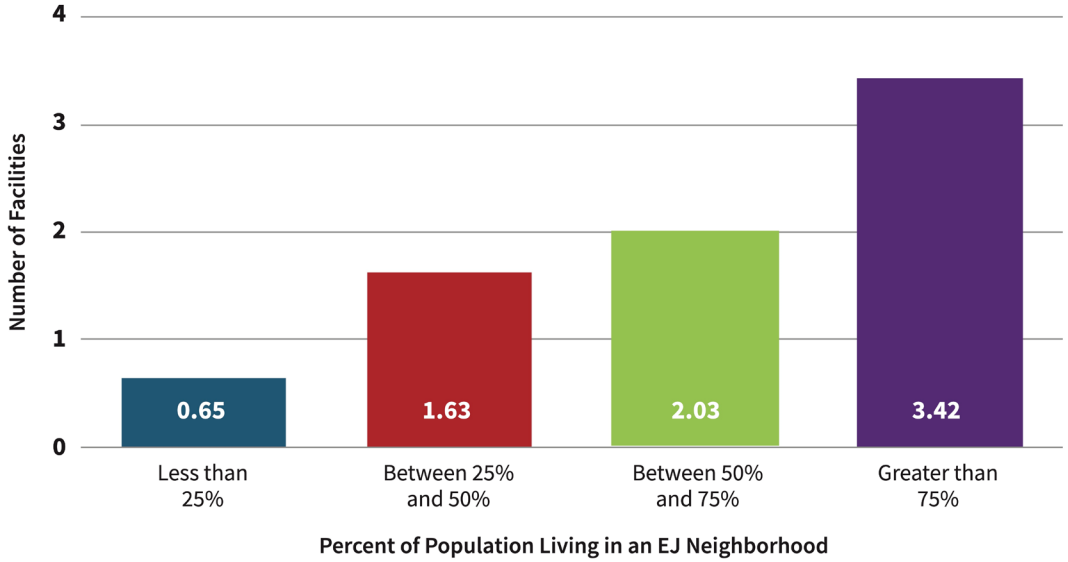
SAFER CHOICE
U.S. EPA PARTNER OF THE YEAR
2024

TURI Environmental Justice Report

"Analyzes the use and release of Toxics in Massachusetts through an environmental justice lens"

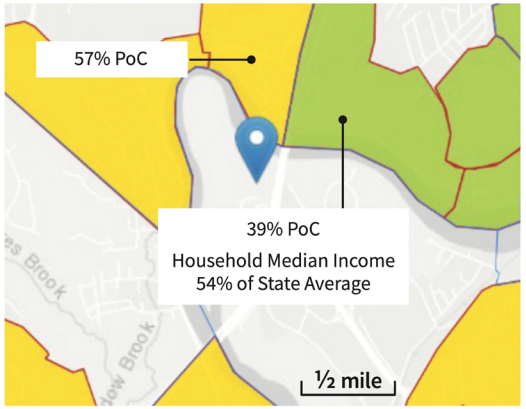


Average Number of TURA Facilities per Municipality, 2020

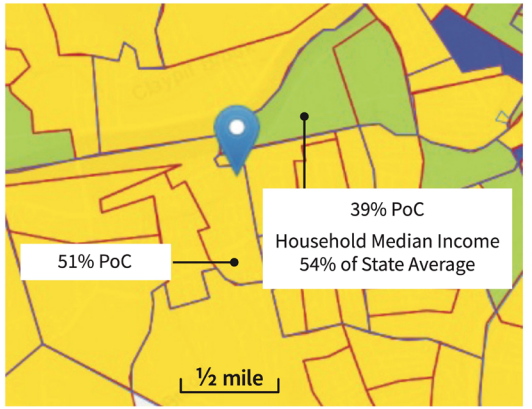


Top Three Facilities for Toxics Release, 2020

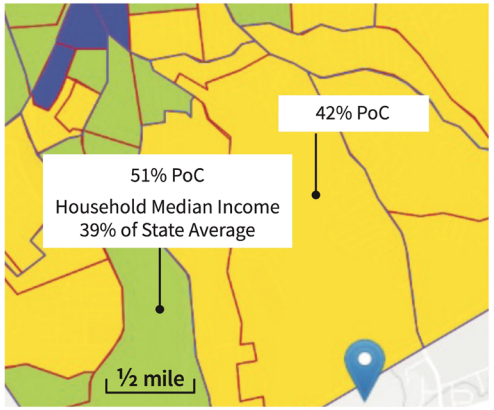
Haverhill, Mass.
#1 Highest Releasing Facility in 2020



Lowell, Mass.
#2 Highest Releasing Facility in 2020



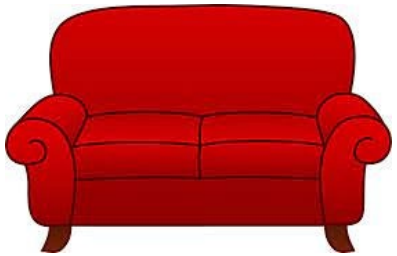
Millbury, Mass.
#3 Highest Releasing Facility in 2020



Minority | Minority & Income | Minority, Income, and English Isolation

MA Flame Retardants Law




Who:	Manufacturer, Retailer
Cannot:	Sell, manufacture for sale, offer for sale, distribute in commerce, import into Mass.
What:	Product that contains any of the named 11 flame retardants or chemical analogues, the total weight of which is >1000ppm for any component part
In:	Bedding, carpeting, children's products, residential upholstered furniture or window treatments

TURI work to implement MA Flame Retardants Law

- Uses the TURA Science Advisory Board (SAB) to review flame retardants every three years
- TURI provides scientific content for the SAB
- Have reviewed 25 analogues to the original 11 flame retardants and provided DEP with advice
- Will review new flame retardants on 3 year cycle for FR law
- Will use science generated to consider FR for TURA

Training and Education

Toxics Use Reduction Planner Certification Course

16 people completed this year's class, predominantly from MA companies

Additional Training Initiatives and Outreach

- Beyond the SDS
- Successful TURI Fall Conference
- Visit from Korean National Institute of Chemical Safety (NICS)
- Partnered with Beyond Benign for hands-on green chemistry learning experience for elementary students at TURI
- ChemCon conference in spring

TURI Staffing Changes

Deputy Director **Liz Harriman** retired in August

TURI has filled open positions with:

Stephan Anstey, Office Assistant

Agnes Cheng, Training Associate

Katie Daly, Communications and Outreach Manager

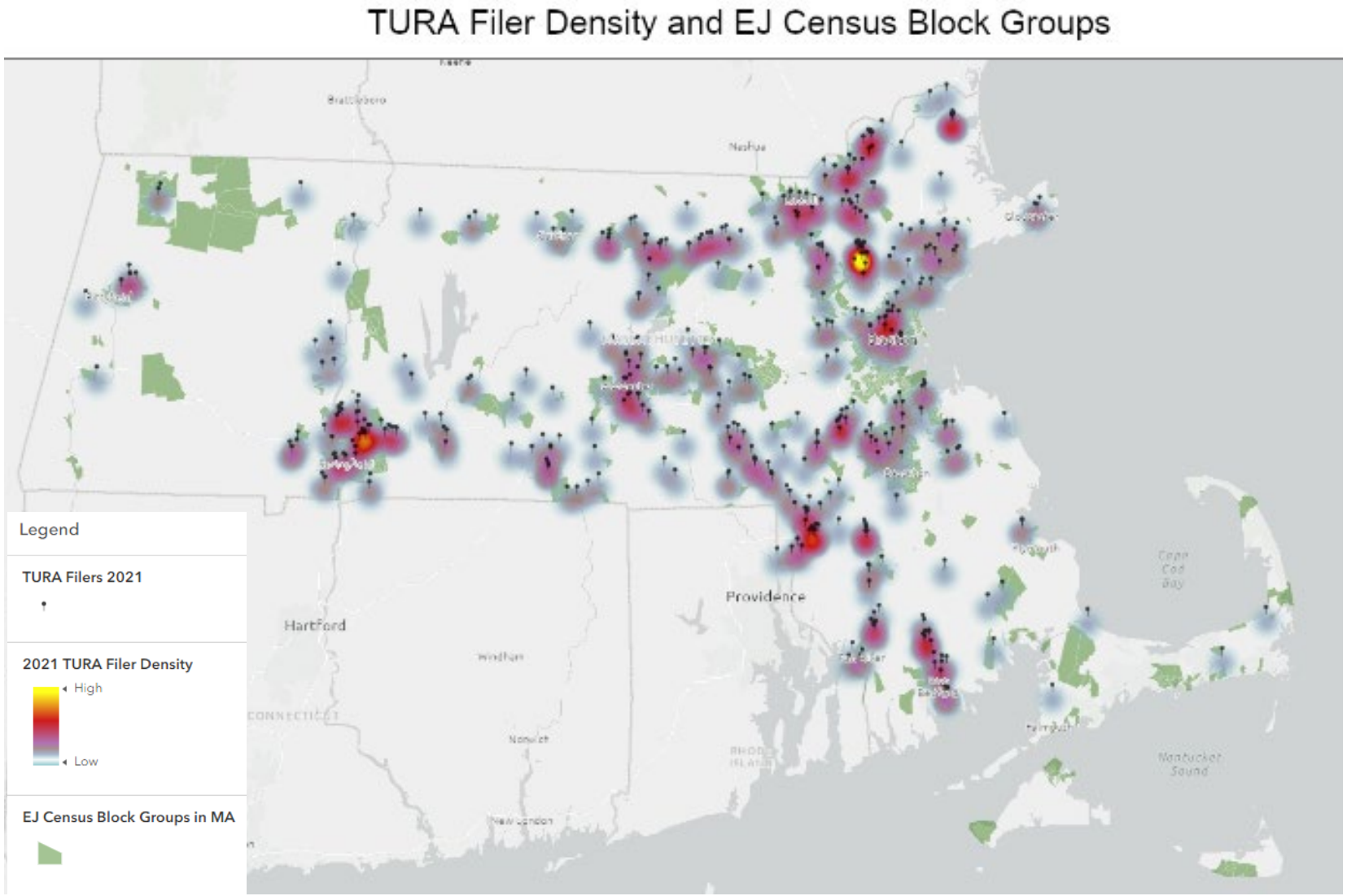
Colin Hannahan, Policy Analyst

OTA Update

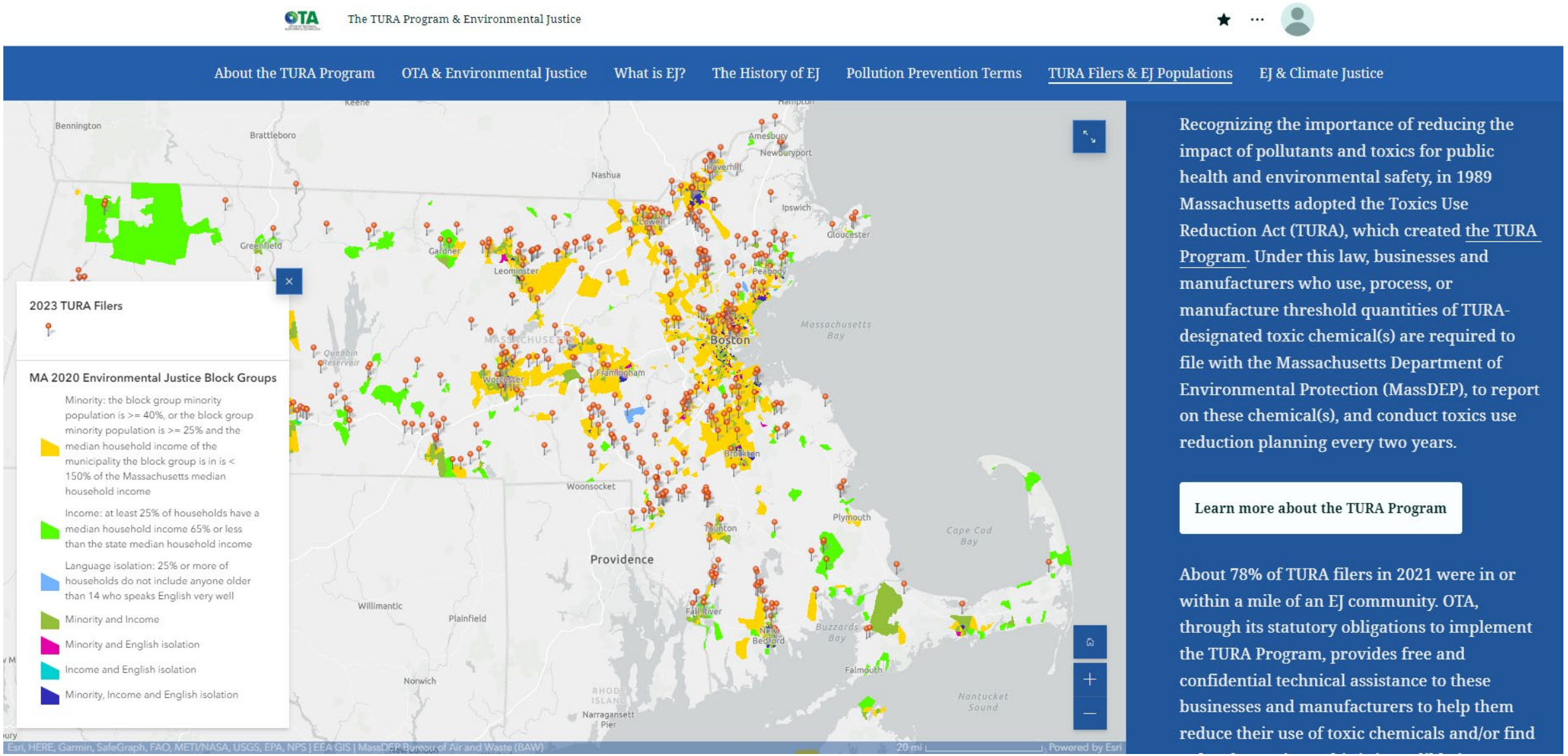
OFFICE OF TECHNICAL ASSISTANCE & TECHNOLOGY

OTA Environmental Justice (EJ)

- OTA added a new EJ seat on Advisory Committee
- OTA actively involved in EJ and climate justice work
- OTA plans to release a GIS Story Map illustrating toxics use reduction in relation to EJ populations
- OTA currently hiring for paid EJ internship position
- OTA submitted first EJ metrics report (final report to be released by EEA early this year)



OTA Environmental Justice Story Map



OTA Staffing Changes

Longtime Environmental Engineer Jim Cain retired

Environmental Analyst Jack Illingworth promoted to Technical Assistance Supervisor

OTA is hiring!

- Environmental Analyst III
- Environmental Justice intern
- MassCAR intern

Massachusetts Dept. of Environmental Protection (MassDEP)

- 2024 was a Planning Year
  - Facilites filed the TUR Report and Plan Summary
  - Their TURA Planner filed a TURA Planner Certification.
  - Facilities had the ability to consider PFAS planning in 2024 as an alternative plan type.

- Six people passed the MassDEP TUR Planner Exam in December 2024.

MassDEP Staffing Changes

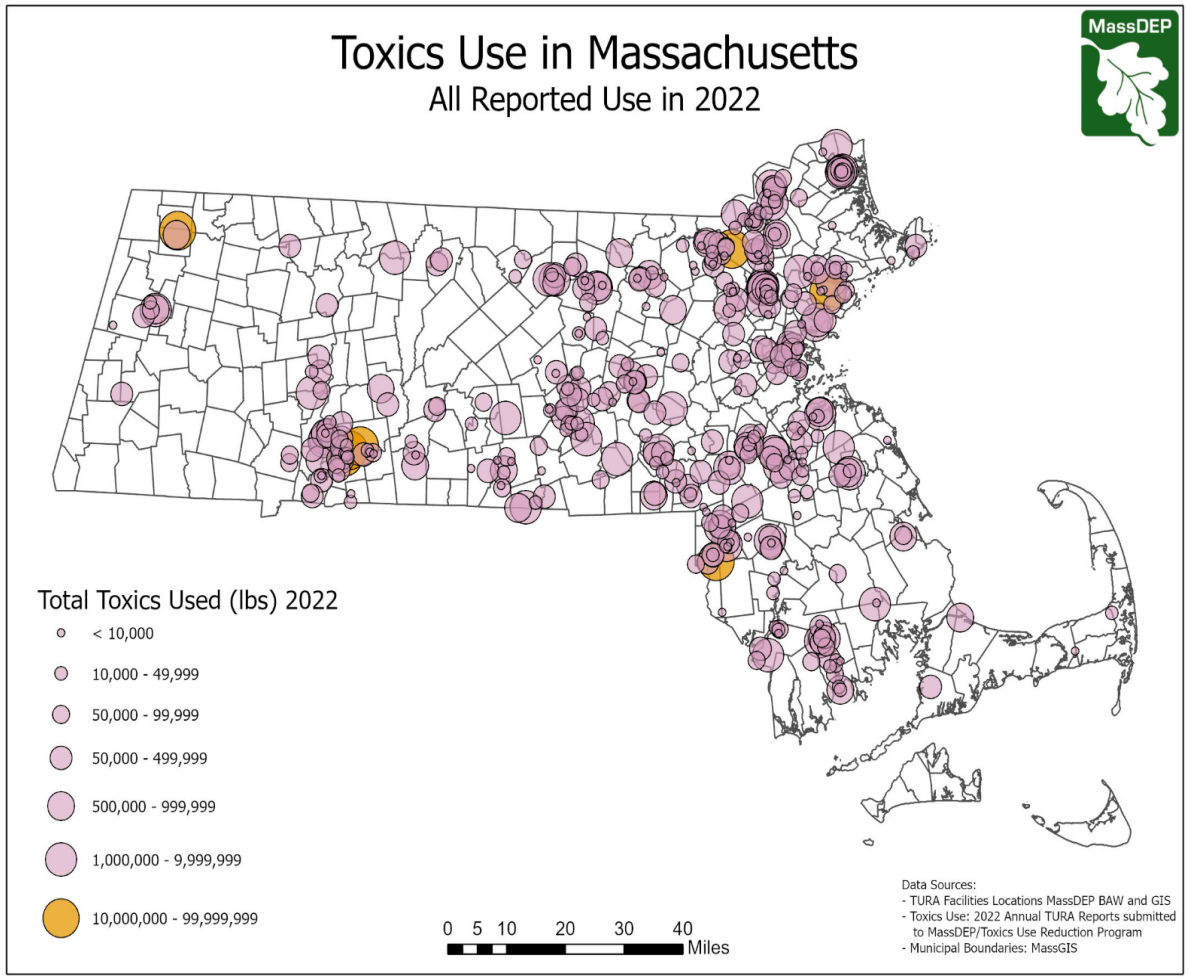
Walter Hope and **Veronica O'Donnell** retired

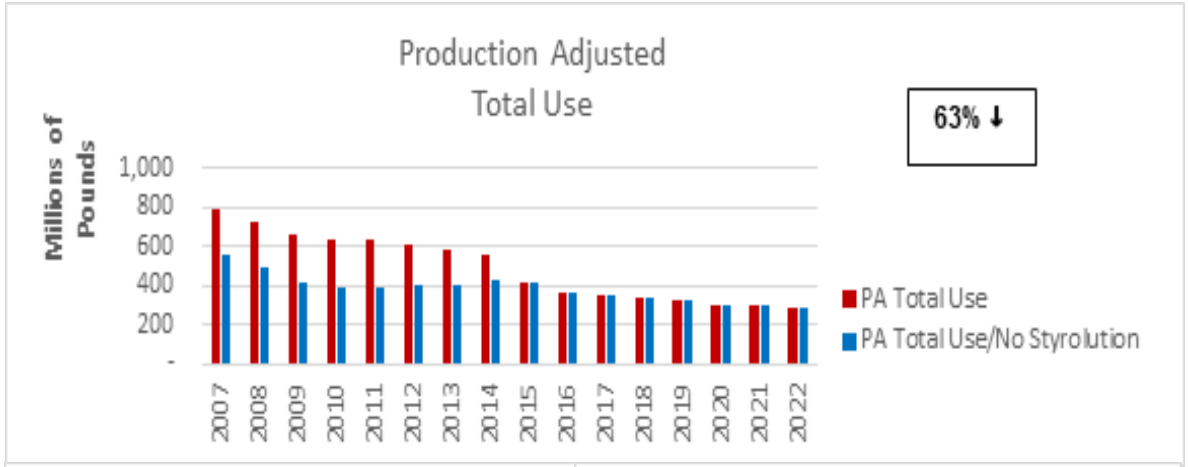
Lynn Cain became the TURA Program Branch Chief

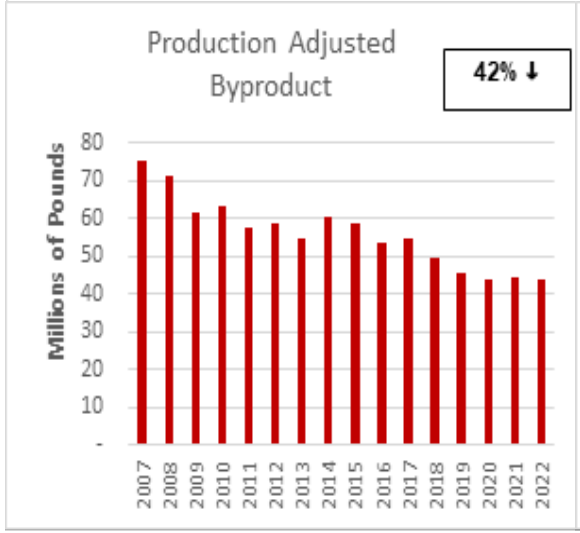
Leoni Desai joined the program

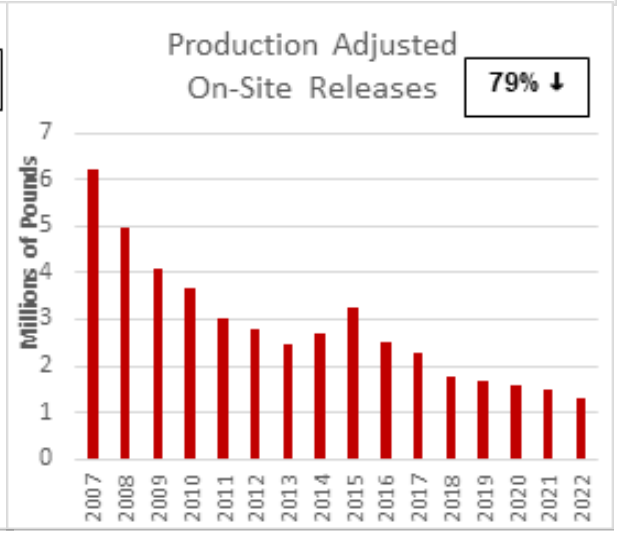
Katelynn King is handling TURA billing

TURA Information Release: Reporting Year 2022 (2007 Core)









Contact us any time!

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Adjourn

Next meeting Thursday, April 17, 2-4pm

Direct all questions to
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