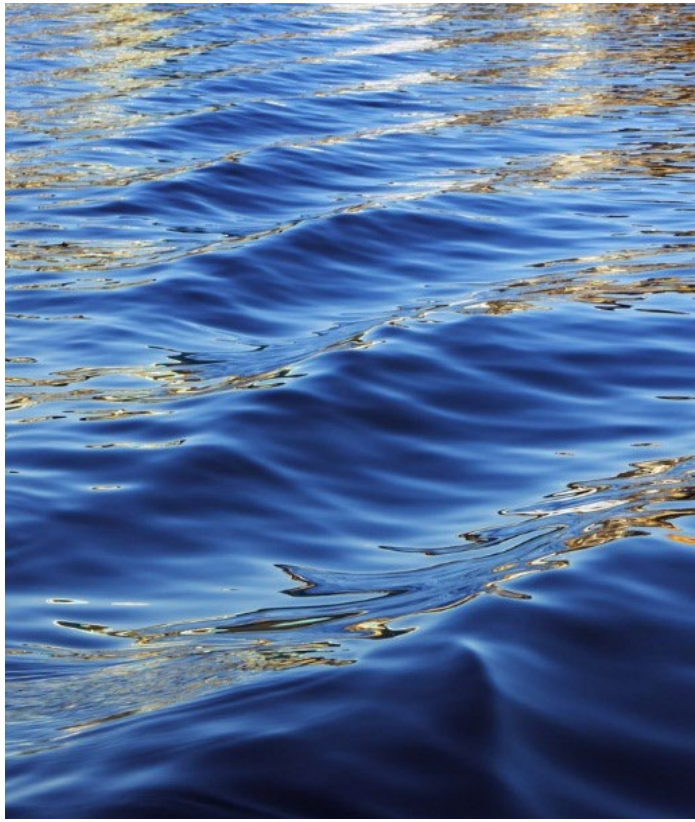
Make 2024 a PFAS Planning Year !

Liz Harriman - TURI
Lynn Cain – MassDEP
Jack Illingworth - OTA

Toxics Use Reduction Conference
Nov 2023



Workshop Objectives

Understand why, how, and when to do an “alternative plan”

Familiarize yourself with PFAS uses

Envision what your PFAS alternative plan would look like

Know where to turn for more information or assistance

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Welcome!

- Alternative Planning/Resource Conservation Planning basics for Assets 4 and 5
- **TUR Planning for PFAS**
- PFAS basics
- Facility-wide characterization and OTA survey tools
  - Practice – breakout group activity
- Paperwork is not a barrier!
  - Case example - walk thru the Plan Summary form
- Resources

RC Planning for Non-Reportable Toxics: TUR Alternative Planning

When can a facility do RC alternative planning?

- RC plans can be done every other planning cycle after the toxics user has completed one plan and 2 plan updates

- What if I just reported a new chemical in the last 2 years?
  - If you have a new chemical (including PFAS NOL), you are still eligible to do RC/alternative planning if you have done a plan and 2 updates, or you can complete a regular TUR Plan

RC focuses on "Natural Assets"

Natural Assets Include

- 1. Energy
- 2. Water
- 3. Materials contributing to solid waste
- 4. TURA chemicals below thresholds (any listed PFAS)
- 5. TURA-exempt substances (non-listed PFAS or exempt uses)

RC Plan Requirements for PFAS Alternative Planning

- Selection of PFAS for asset area(s) 4 and/or 5
- Facility-wide planning
  - Employee Notification is due by January 1, 2024
- Detailed planning
- Plan is signed by TUR Planner that does NOT need RC certification

RC Plan Checklist for PFAS Alternative Planning

Facility-Wide Requirements

- ❑ Employee Notification
- ❑ Management Policy
- ❑ Scope of the Plan
  - ❑ Natural asset selected - PFAS
  - ❑ **Summary characterizing use of selected asset**
  - ❑ Identification and ranking of opportunities
  - ❑ Descriptions of options identified for detailed evaluation
  - ❑ Summary of process used for identifying options
  - ❑ Description of options selected for implementation
- ❑ Expected change in facility-wide usage

Additional Assets

Organized in Guidance around planning approaches:

4. TURA listed substances below threshold amounts
5. Chemical substances exempt from TURA Reporting, including
   - Non-listed chemicals
   - Toxics and other chemicals in exempt uses
   - Toxics and other chemicals in products and articles

Toxics Below Threshold and Chemicals Exempt from Reporting

RC Guidance: page 40;

- Big picture: opportunity to investigate where in your facility PFAS are used, which operations, which types of uses
  - Products and articles: supply chains, customer RSLs
- Facility-wide use characterization – supply chain inquiries
- Prioritize opportunities
- Select uses/operations for detailed evaluation
  - EH&S hazard evaluation – is it safer than using PFAS?
  - Technical and financial evaluation similar to TUR
- Resources

Toxics Below Threshold and Chemicals Exempt from Reporting

What to focus on

- High risk substances, high exposure or emissions
- Customer's priorities or Restricted Substances Lists (RSLs)
- Situations where alternatives are apparent
- High volume substances
- Products in R&D or pilot phase expected to transition to full production
- Best opportunities!

DfE: Products and Processes under Development

For all asset areas or reportable toxics, can do Design for the Environment (DfE)

Facility-wide characterization

- Consider all DfE opportunities

Integrate TUR/RC planning into design process

The Bottom Line

Facility-wide asset use characterization

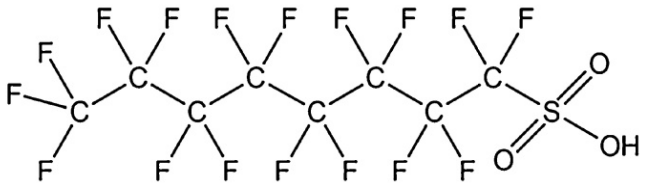
- Comprehensive enough to
  - Identify opportunities
  - Focus on substance or area of high importance
- Detailed/quantitative enough to identify losses, inefficiencies, and measure progress

You should discover something in this process!

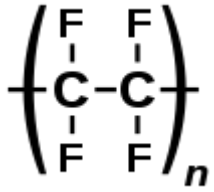
PFAS Basics

What are PFAS?

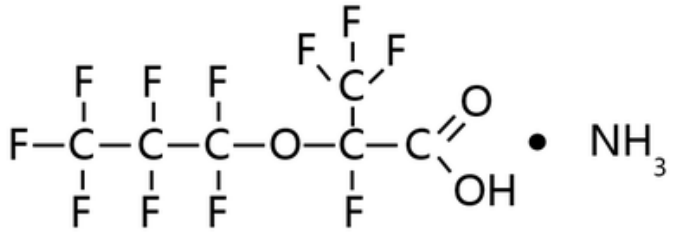
- Fluorinated carbon chain, at a minimum, one perfluorinated carbon
- Large class of thousands of chemicals
  - Not limited to TURA Certain PFAS NOL category and EPA individually listed PFAS
  - Not necessary to determine if specific PFAS are reportable under TURA to do alternative plan



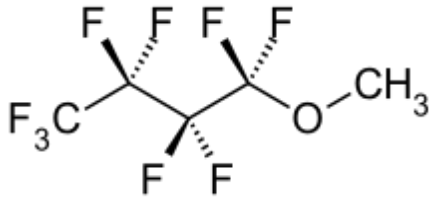
PFOS



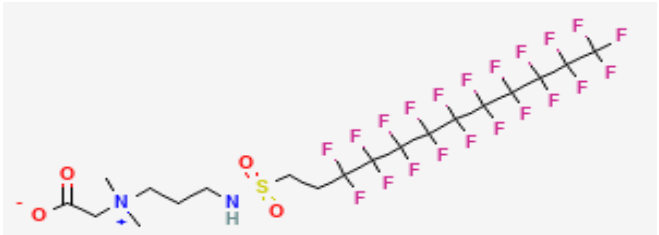
PTFE polymer



GenX Chemical Structure



HFE 7100



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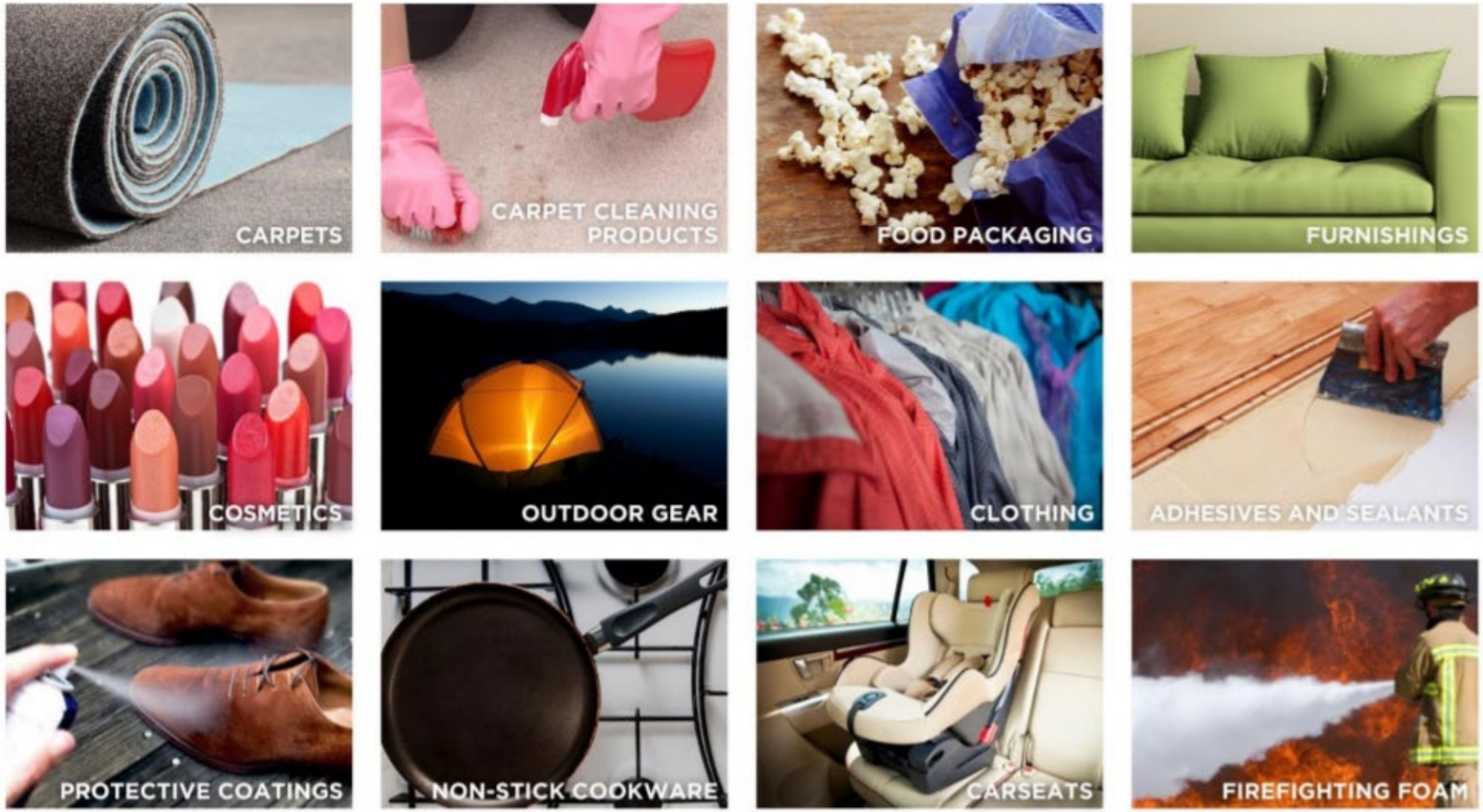
Some Uses and Sources of PFAS



Common Functional Uses

- Oil and water repellency
- Lubricant, emulsifier
- Surfactant, film former
- Non-reactive/low surface tension

Source: Green Science Policy Institute, used with permission. www.greensciencepolicy.org

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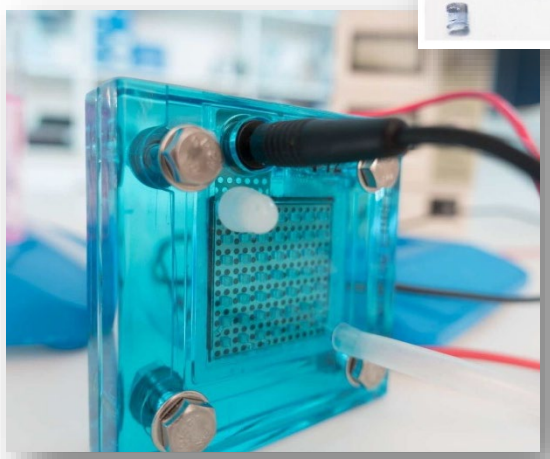
Industrial Uses

- Polymers and Resins
  - Fluoropolymers, and as feedstock and processing aids in their manufacture (e.g., PTFE, PVDF, FEP)
  - Side-chain fluoropolymers
  - Non-fluorinated resin processing aids
  - Fluorination of HDPE containers
  - Additives in coatings
  - Membranes (e.g., Nafion)



Industrial Uses

- Metal finishing
  - Surfactants - Fume/mist suppressants
  - Bath additive in nickel, copper and tin plating
- Solvents - HFE's (hydrofluoroethers),
- Solvents, blowing agents, refrigerants - HFO's, HFC's
- Surfactants, lubricants, coatings in many industries

TUR Alternative Planning: Facility-Wide Characterization

Mass. Office of Technical Assistance (OTA) PFAS in Manufacturing Survey

Jack Illingworth

Environmental Analyst

Massachusetts Office of Technical Assistance

CE Conference

November 14, 2023

OFFICE OF TECHNICAL ASSISTANCE & TECHNOLOGY

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Identifying PFAS Use in Your Facility

Common uses of PFAS in Manufacturing

- Coatings for paper and cardboard products for oil, grease and moisture resistance
- Various powder coatings
- Degreasing - HFE solvents
- Sealants and adhesives, seal packings
- Fire suppression
- Lubricants and cutting oils

Review and Interpret SDSs

- Check your SDSs for products likely to contain PFAS
- Things to look for - PTFE, PVDF, FEP any resin with an "F" in it.
- Confidential Business Information (CBI) – contact your supplier or OTA for help
- If no CAS numbers are available for fluorinated compounds, contact your supplier or OTA for help.

Send a notification letter to your chemical or product supplier

- Use OTA's template to notify your supplier
- Involve your purchasing department in this effort
- Keep records to demonstrate good faith effort

Contribute to developing product list

- The TURA program is developing a list of products confirmed to contain PFAS
- If your supplier notifies you of products containing PFAS, please share this information with OTA/TURI

Paper Manufactuing Survey: *Goal*

- Help companies in your industry with PFAS source reduction -
  - Determining how and where PFAS might be used in your facility will better equip you to reduce or eliminate it.
- Offer assistance with tracking down and reducing the use of per- and polyfluoroalkyl substances (PFAS) in your operations –
  - Sources of PFAS are not always obvious
  - Companies are not always sure where to look

Like all of OTA's work, these surveys are completely confidential

PFAS Paper Manufacturing Survey: *Procedure*

- Participating companies will go through the survey online with a member of OTA's technical staff –
  - We'll flag likely sources of PFAS so that companies can target their source reduction efforts.
  - Survey is administered online using the Qualtrics survey platform – unique link for each company and companies are **not** identified on the survey form.
- Participating companies will be sent the questions in advance so that they can review them and collect the information they'll need to complete the survey -
  - In scheduling the survey date, sufficient time will be allotted to allow companies to complete this step.

Contact Us

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: https://www.linkedin.com/company/mass-ota/

Sign up for our newsletter:

Facility-wide use characterization activity

Where do you expect to find PFAS?

- Select a breakout group based on your industry sector – consultants please choose a sector you work with often.
- Review list of operations and products potentially using PFAS (see list posted in chat or from TURI website).
- Discuss which uses are relevant to your facilities, or ones you work with.
- Breakout Discussion:
  - What additional uses do you know, or suspect, might be applicable?
  - Each breakout group should come back with 3-5 uses they anticipate would most likely be present
  - Identify highest priority uses
- Select a recorder to paste your answers into the chat

Alternative PFAS TUR Planning

Case Example

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Case example

- ABC Wire and cable manufacturer
- Operations include:
  - Wire drawing
  - Extruding insulation and jacketing onto wire
  - Bundling Cat 6 fiberoptic cable
- File under TURA for 20 yrs, currently for antimony compounds
- Getting questions from customers about PFAS in products
- Evaluated use of TURA Certain PFAS NOL for 2022 TURA reporting, but just under 25K lb reporting threshold

ABC Wire and Cable

- Facility- wide characterization
  - Insulation and jacketing – resin extrusion
    - PTFE – 2 different compounded resins
    - PVDF
    - fluorinated polymer processing aids for PVC and PE resins – purchase compounded resins that include 300 ppm PPA
  - Wire drawing and equipment lubricants
    - PFPEs
  - Cat 6 cable splines
    - PTFE articles (include in cable, only cut them, don't process them) (insert image)
  - Ink-jet Printing inks
    - Think they have PFAS, but not on SDS and can't get answer from supplier
  - R&D
    - New materials for wind energy customers

Facility-wide characterization summary

Operation	Chemical	TURA Certain PFAS NOL	Otherwise listed on TURA	2023 Use (lb)	Reportable use/process	Opportunities (selected for plan focus in red)
Insulation and jacketing	PTFE	Yes	No	**22,000**	Yes, extrusion	Long-term evaluation due to Multi-year customer contract
	PVDF	No	No	200,000	Yes, extrusion	Long-term evaluation
Polymer processing aid	HFP/VDF/TFE copolymer	Yes	No	6000	Yes, extrusion but de minimis exemption <1%	Working with suppliers to evaluate non-fluorinated processing aids
Wire drawing lubricants	PFPE	Yes	No	**600**	Yes, processing	Other lubricants available, start gathering information from suppliers
Cable splines	PTFE	Yes	No		No - article	
Printing inks	?				Yes, processing	Keep researching
R&D	DfE for new product lines			0	No – R&D	Evaluate non-PFAS materials
Total reportable use				P: 22,000 O/U: 600		

Alternative TUR Planning: Plan Summary Form

Resource Conservation Plan Summary Form

Facilities are required to complete and submit the Plan Summary form to MassDEP by July 1 of the applicable planning year in which they develop a Resource Conservation Plan.

Resource Conservation Plan Summary Form

Must be submitted to MassDEP by July 1 of applicable even-numbered year, and identifies:

- Asset selected
- Selected Operations
- Baseline Amount of Asset Used
- Options Selected to Implement
- Other Options Considered
- Goals for Reducing the Asset
- Expected Change in Amount of Asset Used

If more than one asset chosen

- Prepare a separate plan summary form for each asset chosen

Resource Conservation Plan Summary Form (Appendix A of RC Guidance)

Facilities are required to complete and submit the Plan Summary form to MassDEP by July 1 of the applicable planning year in which they develop a Resource Conservation Plan.
These are the data elements that are required in the Resource Conservation Plan Summary Form:

A. Targeted Asset

Targeted Asset

Chemical substances exempt from TURA reporting (HFP/VDF/TFE Copolymer Processing Aid, part of the Certain PFAS NOL Category, included in purchased compounded resin, qualifies for de minimis exemption, and R&D/new designs)

Indicate the asset that you have selected for resource conservation planning. If you have chosen more than one asset, then you will need to complete a plan summary form for each asset. The assets are:

- Energy
- Water
- Materials that contribute to solid waste
- Toxic substances used below threshold amounts (i.e., TURA-listed chemicals used below reporting thresholds)
- Chemical substances exempt from TURA reporting

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Resource Conservation Plan Summary Form

B. Selected Operations

List the operations the resource conservation plan covers. If an operation is not listed, choose “other”.

1. Operation Code	2. Operation Code	3. Operation Code	4. Operation Code
33	***35***	***39***	

x Other (describe): ***Production operations focus on HFP/VDF/TFE copolymer processing aids that are part of non-fluorinated compounded resins used for wire insulation and jacketing.***

33	Production line
34	Pumps
35	Research and development
36	Shipping/receiving areas
37	Spa
38	Stock rooms
39	Other

Resource Conservation Plan Summary Form

C. Baseline Amount of Asset Used

This includes the total amount of the asset used during the baseline calendar year, reported as a total amount.

2023	***6,000***	***Chemicals***
Year	Total Amount of Asset Used	Unit of Measure (Pull down list)

This section includes:

- The baseline year (for example 2023 the year on which the plan is based)
- The total amount of asset used in the base year
- Units of measure are provided in a pull-down list. You will need to choose a unit of measure for the asset you have chosen. [not sure what this means]

Resource Conservation Plan Summary Form

D. Options Selected to Implement

Purchasing compounded resins with non-fluorinated processing aids.
Designing new wind energy product line without PFAS.

List and describe the resource conservation options chosen to be implemented.

Resource Conservation Plan Summary Form

E. Other Options Considered

List the resource conservation options you considered but decided not to implement. You also may provide an explanation of why you chose not to implement a particular option.

List and describe other resource conservation options that you considered but decided not to implement. This may include an explanation of why you chose not to implement these other options.

Resource Conservation Plan Summary Form

Section F is a list of the resource conservation goals for reducing the asset use. The goals for reduction should be indicated as a percentage and/or a specific amount of expected reduction by a future year. (For example, if your baseline year is 2023, then your goal year may be 2025.) A brief description of each goal is also included. These goals may be the same as the expected change listed in Section G, or they may be different.

For example, your facility may set a 5- or 10-year goal for reducing use of the asset that goes beyond the two-year planning period.

Resource Conservation Plan Summary Form

F. Goals for Reducing the Asset

List the resource conservation goal(s) as a percentage reduction or a specific amount reduction over a certain time period in the unit of measure (as indicated in Section B) and the expected change. The first line is an example.

Amount of Reduction	Unit of Measure	Goal by date (Year)	Description of Goal
Example: 15%	Gallons	2011	Reduction of potable water use and sewer discharge
F.1.a	F.1.b	F.1.c	F.1.d
75%	***Lbs/Year***	***2025***	***Reduction of use of HFP/VDF/TFE Copolymer Processing Aids (PPAs), (part of the Certain PFAS NOL Category)***

Resource Conservation Plan Summary Form

G. Expected Change in the Amount of Asset Used

Indicate the expected change in the amount of the asset(s) to be used (due to the options implemented) between the year on which the plan is based and two years after the plan is due.

The unit of measure in this section is ***Chemical substances exempt from TURA reporting*** (as listed in Section B). (Pull down list)

Note: You will report actual changes in the amount of the asset used on a resource conservation progress report that you must submit with the next toxics use reduction plan summary. However, if there are actual changes to report due to an option already implemented, you may include them in Section H below.

Expected Annual Change: ***4,500 (75% of 6,000)***

This section includes the expected annual change in the amount of asset used (due to the operations implemented) per year. This change in asset use should be the change due to the options implemented rather than change in facility wide use due to other factors.

You should indicate the same unit of measure from the pull-down list as you indicated in Section C.

Resource Conservation Plan Summary Form

H. Prior Efforts (Optional)

Results of Prior efforts *may have* resulted in reductions of the asset used. Please indicate the reductions accomplished as a result of projects implemented since July 1st of the previous even-numbered calendar year.

The unit of measure in this section _____ (as listed previously in Section C).

You should indicate the same unit of measure from the pull down list as you indicated in Section C.

Resource Conservation Plan Summary Form

I. Additional Information

You may provide additional information about your resource conservation plan.

We spent a lot of our planning time on a thorough facility-wide PFAS use characterization in all of our manufacturing processes. Uses included PTFE and PVDF insulation and jacketing, polymer processing aids (PPAs), PFPE wire drawing lubricants, and PTFE cable splines. This plan focuses on finding non-PFAS PPAs for PVC and PE insulation and jacketing. We are still testing the alternative PPAs at this time and have some promising products; we expect to adopt them in the largest volume applications over the next year. We have also included investigation of non-PFAS materials for new products under development for wind energy.

You may include any additional information about your facility's resource conservation plan that you would like to report to MassDEP.

Resource Conservation Progress Report Form

Facilities are required to complete and submit this form to MassDEP by July 1 of the next planning year after they developed a Resource Conservation Plan.

For example, if a facility completed a Resource Conservation Plan in 2024, then the facility would be required to submit a Resource Conservation Progress Report by July 1, 2026.

In addition to the Resource Conservation Progress Report, the facility must also submit a TUR Plan Summary for that planning year.

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Resource Conservation Progress Report Form (see Appendix B of RC Guidance)

Facilities are required to complete and submit this form to MassDEP by July 1 of the next planning year after they developed a Resource Conservation Plan. For example, if a facility completed a Resource Conservation Plan in 2016, then the facility would be required to submit a Resource Conservation Progress Report by July 1, 2018. The data elements included on the Progress Report are described below

A. Targeted Asset

Chemical substances exempt from TURA reporting (HFP/VDF/TFE Copolymer Processing Aid, part of the Certain PFAS NOL Category)

(Pull down list)

This is the asset that you selected in your resource conservation plan. This is the asset that you selected in Section A of your Resource Conservation Plan Summary Form. The pull-down list of assets is:

- Energy
- Water
- Materials that contribute to solid waste
- Toxic substances used below threshold amounts
- Chemical substances exempt from TURA reporting

Resource Conservation Progress Report Form

B. Identification Information

1. Year Resource Conservation Plan was completed: 2023
2. Progress Report Date: 2025

1. The year the Resource Conservation Plan was completed is the previous planning year (2 years prior to current planning year).
2. The Progress Report Date is the current date that you will be submitting the Resource Conservation Progress Report.

Resource Conservation Progress Report Form

C. Resource Conservation Progress

BASELINE INFORMATION
(From Section C, RC Plan Summary)

a. Year: ***2023*** b. Amount used per year: ***6,000*** c. Unit of Measure: ***Chemicals Exempt - Pounds Per Year***

a. The baseline year is from Section C of your Resource Conservation Plan Summary form.
b. The total amount of asset used per year. This is the baseline amount used, from Section C of your Resource Conservation Plan Summary form.
c. The unit of measure (provided in a pull-down list). It is the same unit of measure that you selected in Section C of your Resource Conservation Plan Summary form.

The pull-down list of units of measure is:

- MMBTU - Energy
- Gallons - Water
- Pounds – Solid Waste or Toxics

Resource Conservation Progress Report Form

REDUCTION GOAL
(From Sections F and G, RC Plan Summary)

d. Year to be Achieved: ***2025***

e. Expected Annual Reduction: ***4,500***

f. Actual Annual Reduction: ***5,020***

g. Description: ***Reduction of use of HFP/VDF/TFE Copolymer Processing Aid (PPAs), part of the Certain PFAS NOL Category***

d. The year to be achieved is from Section F of the Resource Conservation Plan Summary Form, in the Goal by date (Year) column.

e. The expected annual reduction is from Section G of the Resource Conservation Plan Summary Form.

f. The actual annual reduction is the actual amount of the asset that your facility reduced per year.

g. The description is from Section F of the RC Plan Summary Form, Description of Goal.

* The form will allow you to enter more than one Goal from Section F of the Resource Conservation Plan Summary Form.

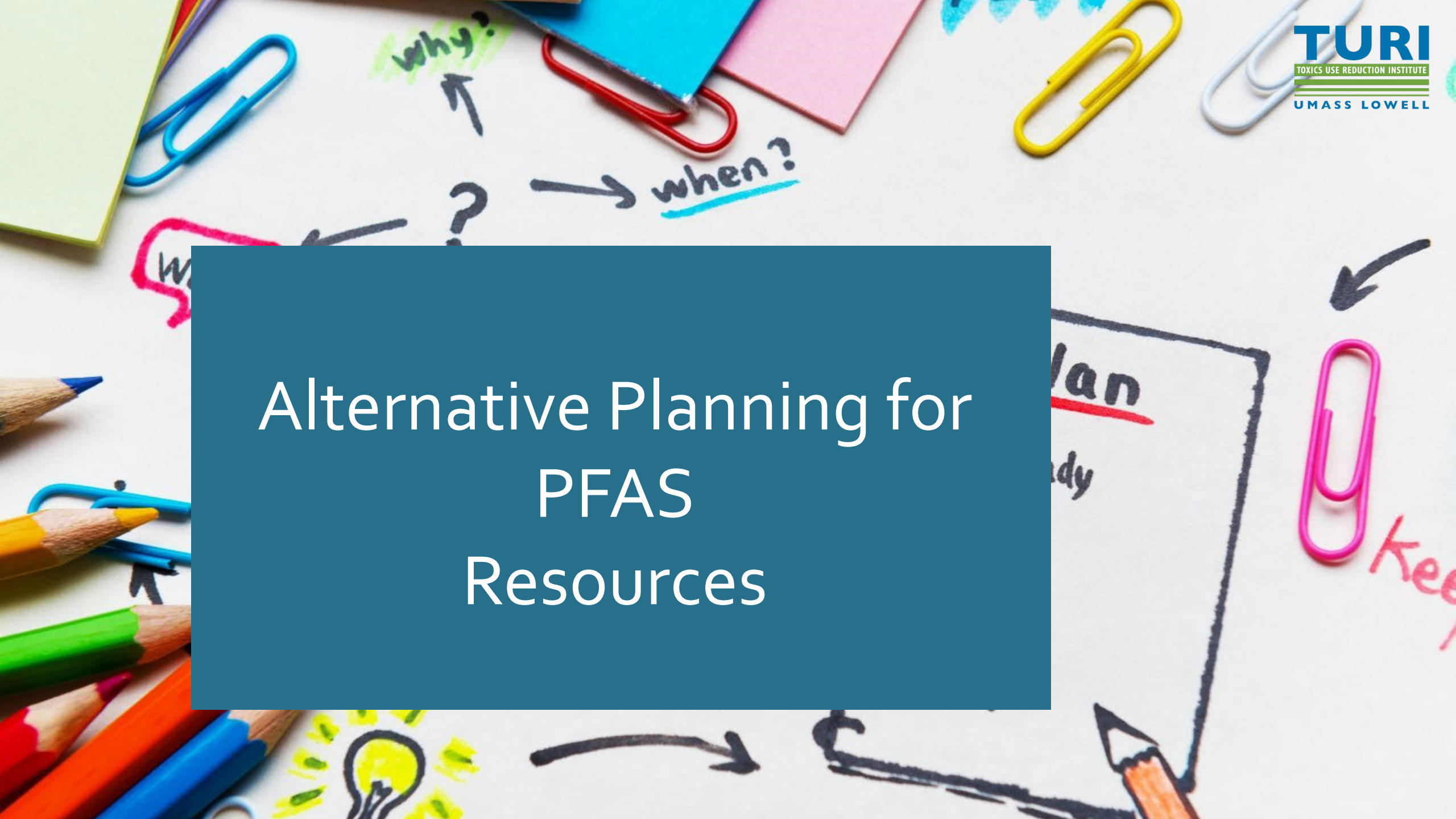
Resource Conservation Progress Report Form

D. Options Implementation Status

Provide implementation status for each selected option listed in Section D of the Resource Conservation Plan Summary Form.

Non PFAS PPAs	***Identified, tested and implemented non fluorinated PPAs in purchased PVC resins and most PE resins. Still working on two fine wire applications with stringent specifications.***
DfE project on new wind energy products	***We have successfully identified and piloted non fluorinated insulation and jacketing and are going through final testing to verify that they meet all performance specifications.***

List the options selected to implement from Section D of your Resource Conservation Plan Summary, and provide implementation status for each option. In addition, if any option listed in Section D of the Resource Conservation Plan Summary form was not implemented, state the reason it was not implemented.



Alternative Planning for PFAS Resources

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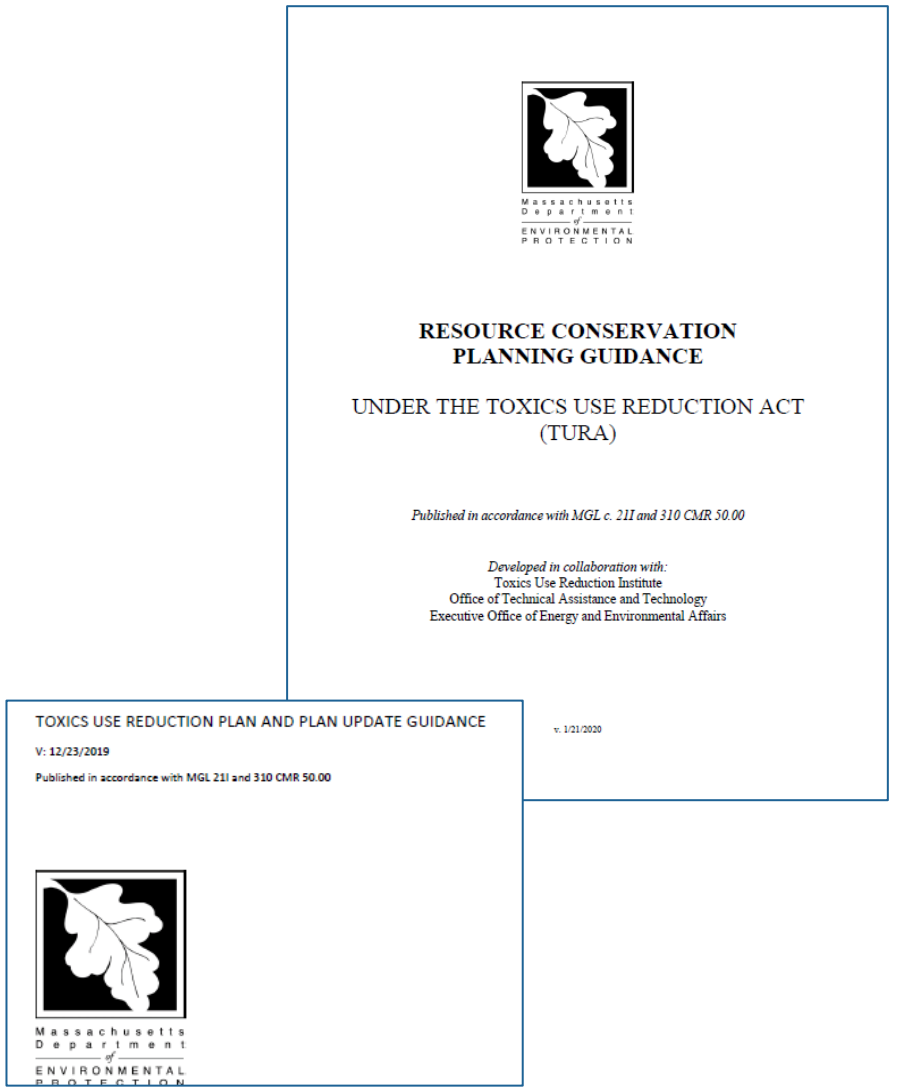
MassDEP Resource Conservation and Regular TUR Planning Guidance

- RC PLanning Guidance (1/21/2020)
- TUR Planning Guidance (12/23/2019)
- Clarifies requirements in the regulations
  - Gives you an idea of what is expected of you in RC and TUR Planning
  - Provides examples of RC and TUR opportunities
- TURA Reporting Instructions
  - Appendices have PFAS reporting guidance



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PFAS info resources

- PFAS Use information
  - Gluge et al 2020 An overview of the uses of per- and polyfluoroalkyl substances (PFAS) - detailed lists in journal article Supplementary Files
  - OECD PFAS Portal – includes publications on coatings, paints and varnishes, food packaging, and side-chain polymers
  - Minnesota Pollution Control Agency – metal finishing industry report
  - EU PFAS Restrictions Proposal - Main Annex XV Report with overview of uses and alternatives in Table 8, and Annex A with more detailed use information
  - PFAS in building materials – Green Science Policy Institute
- OTA PFAS Paper Industry Survey
- Supplier notification letter template (updated Nov2023)
- PFAS Resources webpage - includes prior presentations

Toxics Use Reduction Program

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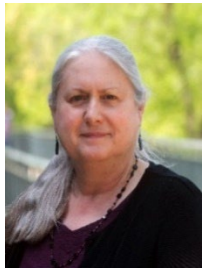

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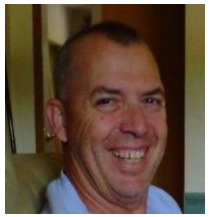

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