



# Making the Most of Your TUR Planning Activities

Updated Tools and Guidance from the TURA  
Program

November 13, 2019  
TURA Continuing Education Conference  
Norwood Four Points Conference Center



The TUR Planner acts as the proxy for MassDEP inspectors, assuring that a company's TUR Plan satisfies the requirements and intent of toxics use reduction planning.

# Agenda

We'll keep a bike rack of questions for DEP

We'll be using PollEverywhere, a smartphone-enabled participation tool

Clues from MassDEP on areas to be more diligent about when planning

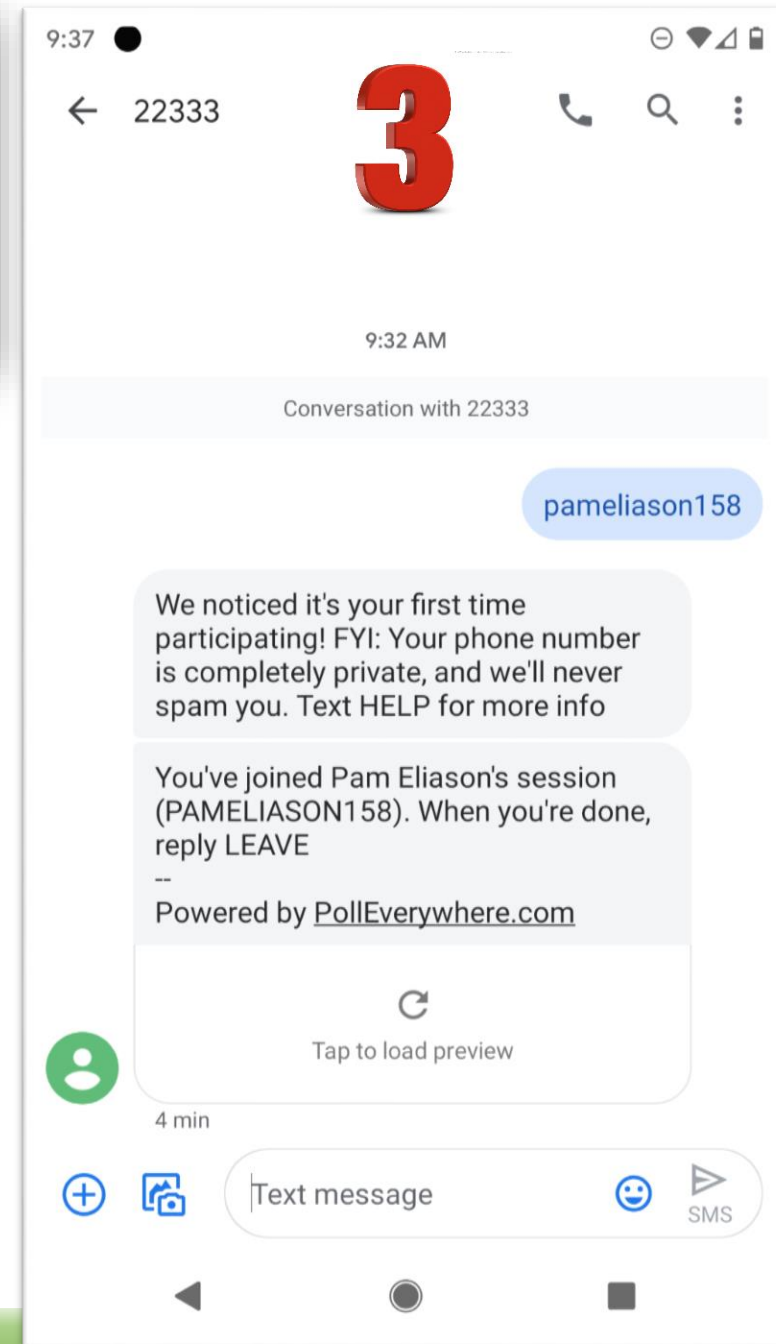
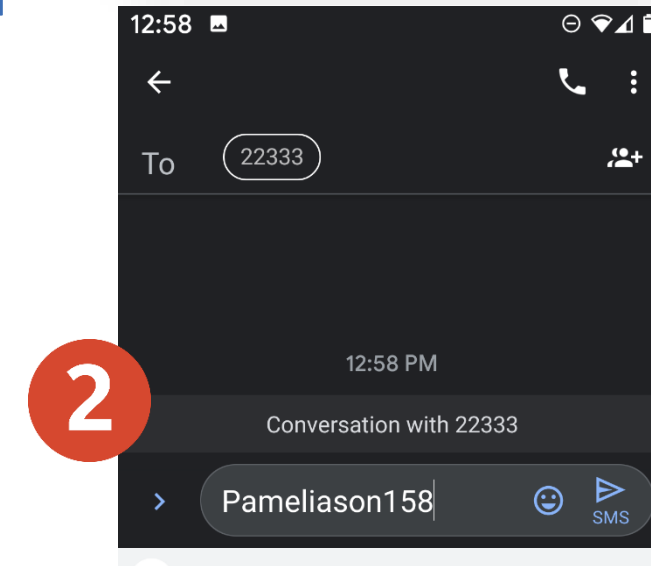
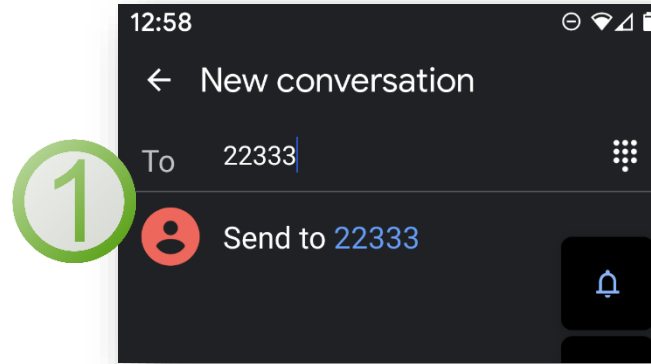
Highlights from the planning guidance update

Updated tools to support your efforts

# How to participate in the polls

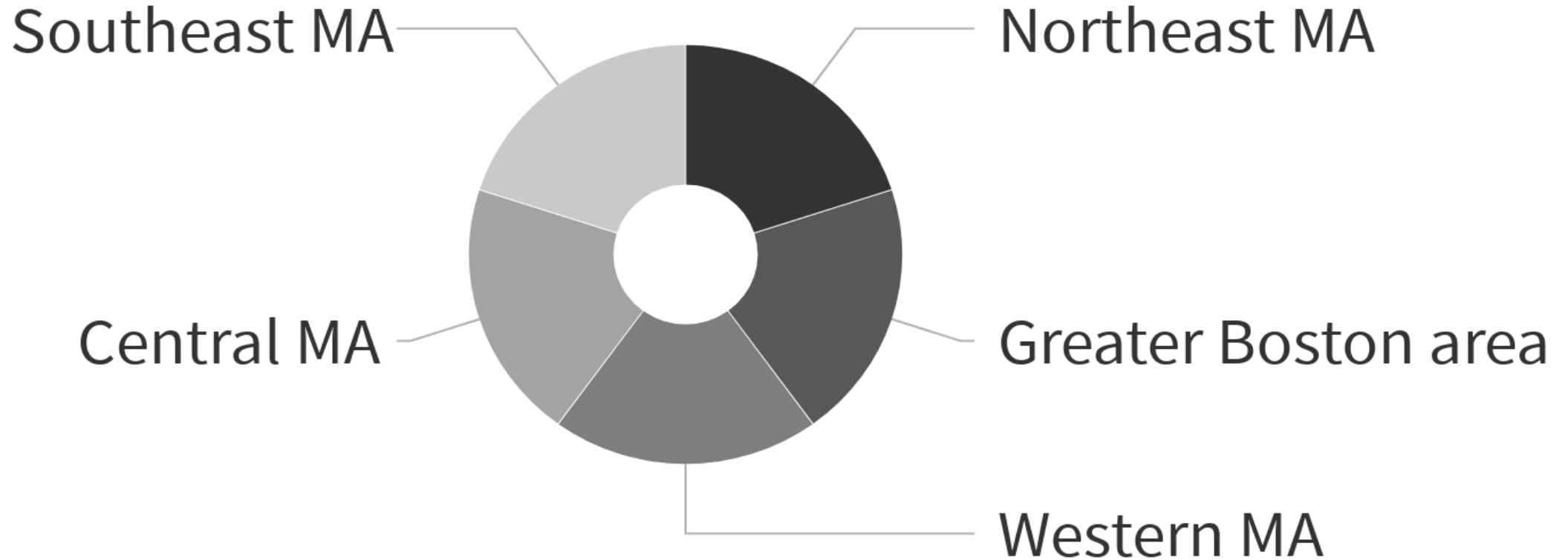
- 1 Send texts to **22333** to participate in real time
- 2 Initially, text the message **“pameliason158”** (don't add spaces) to connect to this polling session
- 3 Then get this message ...
4. With each poll, you'll see prompts on the screen, often letters that correspond with various possible responses
5. Text your response and see the poll updates happen!


Alternatively, you can go to [PolIEv.com/pameliason158](https://PolIEv.com/pameliason158) on your laptop or tablet to participate.



# Which region is your facility located within?

■ Northeast MA **A** ■ Greater Boston area **B** ■ Western MA **C** ■ Central MA **D** ■ Southeast MA **E**








# What challenges in TUR Planning (one word) do you encounter at your facility?



Start the presentation to see live content. Still no live content? Install the app or get help at [PollEv.com/app](https://PollEv.com/app)



# What's one word that describes positive aspects of TUR Planning at your facility.



Start the presentation to see live content. Still no live content? Install the app or get help at [PollEv.com/app](https://PollEv.com/app)

# DEP findings from recent Requests for Information

- Major deficiencies noted include:
  - Incomplete economic evaluation or cost of toxics assessment
  - Incomplete or missing process flow diagrams
    - Missing chemical input and output information
    - Missing information on byproduct or emissions
    - Not production unit based
  - Documentation associated with materials balances missing or incomplete
  - No TUR option implementation schedule developed



# Other deficiencies noted

- Chemical use per unit of product not determined
- Discrepancies between chemical use identified in the Plan and what is reported (Form S)
- Scope does not include description of production unit
- Cost of toxics not determined per unit of product
- Organizational inefficiencies
  - No table of contents
  - Data or tables not clearly labelled
  - Extraneous documents submitted

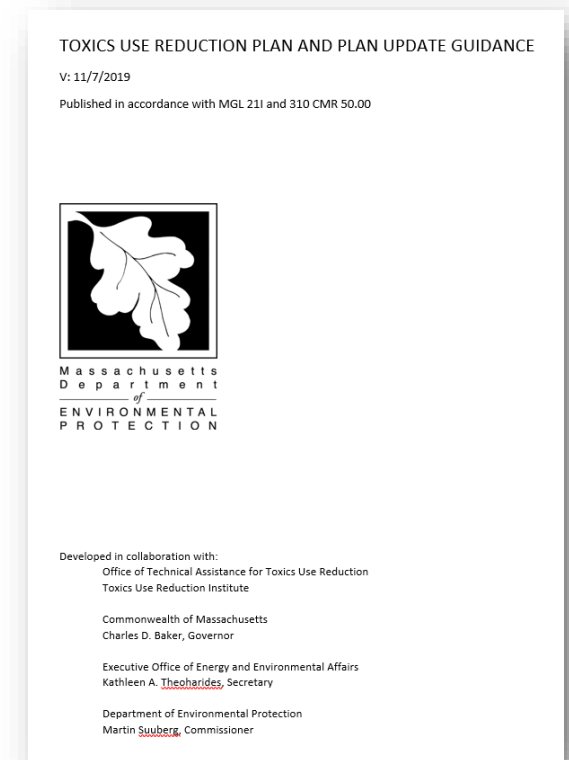
## EXHIBIT 1 - CHECKLIST OF ITEMS IN THE PHYSICAL PLAN

*Note that this does not include information on the TUR team members (names and titles, assignments) or meeting notes, which are important parts of TUR Plan documentation.*

✓	<b>An organized compilation of TUR Plan documents/sets of documents</b> <i>(Check off all elements that have been incorporated into your physical TUR Plan)</i>	<b>Regulatory Citation</b>
1	<b>Written Toxics Use Reduction Management Policy with the following minimum elements:</b>	
	Date during this planning cycle policy was either revised or reviewed	310 CMR
	Description of how facility encourages TUR	50.43 (1)
	Description of policies that encourage or discourage TUR	
2	<b>Written description of the employee notification procedure that includes:</b>	
	Date employees notified (must be by January 1 of the Planning Year)	310 CMR
	Notification method	50.42 (5)
3	<b>Written Description of the Contents of the Notification (or a copy of the notification or the prepared remarks) that includes:</b>	
	Toxic Substances and Production Units covered by the plan	310 CMR
		50.42 (5)

# New planning guidance now available

- Includes the following for each element:
  - Content
  - Purpose
  - Plan Update differences
  - What must be in the physical plan
- Appendices provide useful checklist and tools to support TUR planning activities



<https://www.mass.gov/media/914706>

# Planning is NOT required when ...

- The planning year is the first year in which a Form S will be required for the covered toxic
  - Covered toxics must have been reportable in at least one year *prior* to the planning year
- Chemical use has been eliminated or reduced below the reporting threshold in the planning year
  - **BUT** – subject to enforcement if reductions not successful
- The facility is scheduled to close
  - **BUT** – subject to enforcement if it does not close

# Facility-wide planning elements

Statement of the management policy regarding TUR

Statement of the scope of the Plan

Expected change in the use of each covered toxic and the amount of each covered toxic generated as byproduct

- Base this on TUR techniques chosen to be implemented
- Include amount in total pounds of use or byproduct

# What must be included in your Plan Scope

For each production unit included in the Plan, provide a description of:

- The number assigned it;
- The process(es) associated with it;
- The product produced by it; and
- The chemical and CAS number of each covered toxic manufactured, processed or otherwise used in it.

A summary of the TUR options identification process used

A brief description of the technologies, procedures or training programs identified

# Only facility-wide planning required when covered toxics are used in:

## Waste treatment operations

- If also used in other operations, like cleaning, production unit level planning required for those uses

## Pilot plants

- Pre-commercial production systems designed to determine appropriateness of new process or technology

## Startup production units

- Only true until full production reached, or 2 years from initial operation, whichever is shorter

## Laboratories

- This does not apply to specialty chemical production

# Production unit information required in each Plan

Process flow diagram

Amounts of use, byproduct and emissions

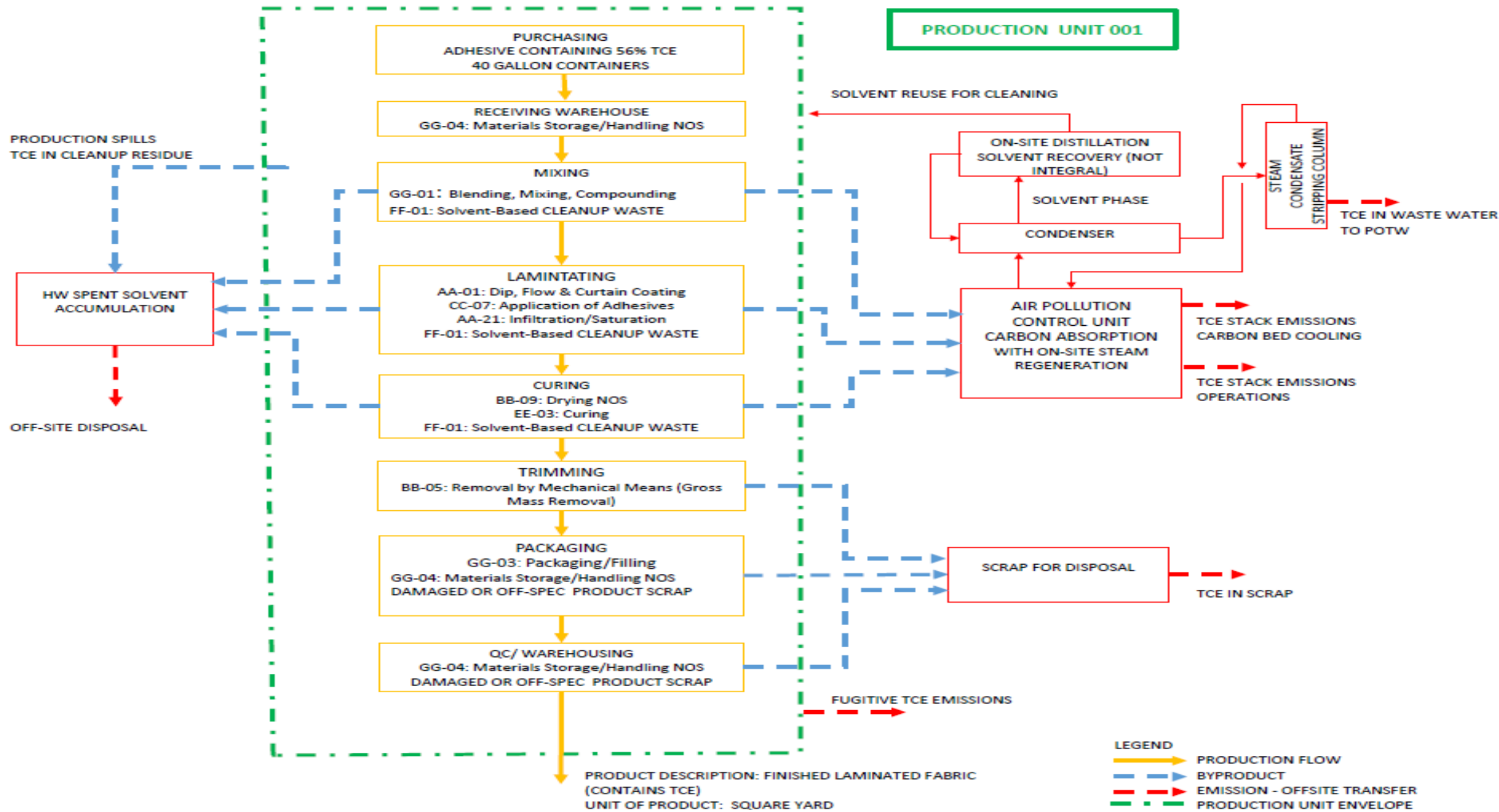
- Total and per unit of product
- Include onsite and off site byproduct and releases, by environmental media
- Describe estimation methods used

Unit of product

Explanation of the purpose of the covered toxic

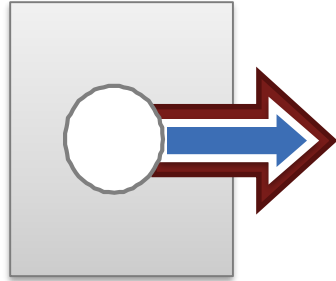
Cost of use of each covered toxic





# Manufacture, Process, Otherwise Use

## Manufacture



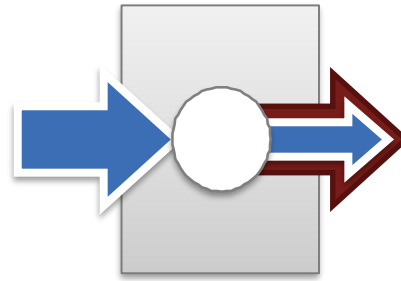
### Create a toxic substance:

- *Intentionally* – to incorporate into the product (e.g. causing a reaction to produce a chemical product)
- *Unintentionally* – either as part of the product, or as byproduct (e.g., nitrate compounds)
- *Import* the substance



**Production Unit**

## Process



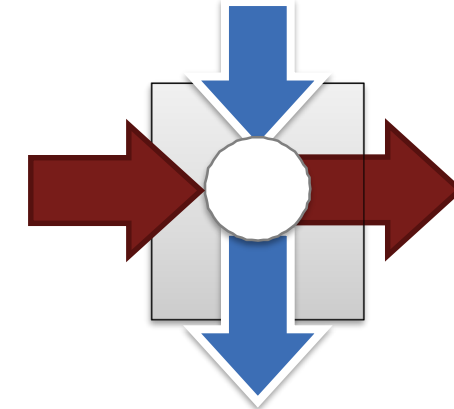
### Prepare a toxic substance after its manufacture.

Toxic chemical is intentionally incorporated in the product (e.g. incorporate into a coating formulation).



**Toxic substance**  
inputs and outputs

## Otherwise Use



Use a toxic substance in a way that it is not intentionally incorporated into the product (e.g. degreasing a part before subsequent process steps take place).



**Product**  
inputs and outputs

## EXHIBIT 3 - OPTIONAL FORM THAT CAN BE USED FOR MATERIALS ACCOUNTING PURPOSES

OPTIONAL TABLE FOR REQUIRED COVERED TOXIC USE BYPRODUCT AND ON AND OFFSITE EMISSIONS/RELEASES CALCULATION FOR PRIOR CALENDAR YEAR <small>Complies with 310 CMR 50.44 (2), (5) &amp; (6)</small> COMPLETE ONE PER PRODUCTION UNIT, INCLUDE ALL COVERED TOXICS APPEND CALCULATIONS AND STATEMENT OF ESTIMATION METHODS AND LOCATION OF SUPPORTING DOCUMENTATION						
<b>Date Prepared:</b>		<b>Production Unit #:</b>		<b>Unit of Product:</b>		
<b>Location of Supporting Documentation:</b>						
	<b>Covered Toxic</b>		<b>Covered Toxic</b>		<b>Covered Toxic</b>	
Chemical Name						
CAS #						
Purpose of Chemical						
	<b>Pounds</b>		<b>Pounds</b>		<b>Pounds</b>	
<b>1. USE</b>	Total	Per unit of product	Total	Per unit of product	Total	Per unit of product
a. Manufactured						
b. Processed						
c. Otherwise Used						
d. TOTAL (sum of a-c)						
e. Byproduct						
f. Released as or disposed of as "Emissions"* Byproduct disposed of or released onsite or transferred offsite						
<b>2. EMISSIONS MANAGEMENT (BYPRODUCT FATE)</b>	Total Pounds		Total Pounds		Total Pounds	

# Cost of toxics

This is the basis for the economic evaluation

Quantitative if one or more technically feasible option identified

- Affirmatively state which of the cost elements called out in 310 CMR 50.46A are/are not relevant
- Calculate total annual cost and cost per unit of product
- Identify costs that cannot be quantified

Qualitative only if no technically feasible options identified

- Identify relevant costs – those that would change in a meaningful way if use or byproduct increased or decreased.

Base your analysis on costs associated with calendar year prior to planning year



Clearly articulate any assumptions made when allocating costs to a production unit



# Options identification

- Must consider each of the 6 TUR techniques
- Must describe
  - Personnel involved in TUR options identification process
  - Information sources consulted
  - Techniques used for gathering information
- Must list technologies, procedures or training programs identified





# Which TUR Technique have you had the best TUR results with?

Input Substitution



Product Reformulation

Production Unit  
Modernization

Improved O&M

Integral Recycling

Production Unit/Process  
Redesign/Modification



# Which TUR Technique have you achieved the most SAVINGS with?

Input Substitution

Product Reformulation

Production Unit  
Modernization

Improved O&M

Integral Recycling

Production Unit/Process  
Redesign/Modification



## EXHIBIT 5 - OPTIONAL NEW TUR OPTIONS IDENTIFICATION AND TECHNICAL FEASIBILITY DOCUMENTATION

PRODUCTION UNIT #:		PLANNING YEAR	
<b>Technique 1 Description</b>			Date Identified
TUR Type (Circle)	<input type="checkbox"/> Input Substitution <input type="checkbox"/> Product Reformulation <input type="checkbox"/> Production Unit Modification <input type="checkbox"/> Production Unit Modernization <input type="checkbox"/> Improved Operation and Maintenance <input type="checkbox"/> Integral Recycling		
Covered Toxic(s) Addressed (List)			
Is it Legal?	Yes No	Why Not:	
Does it meet the definition of TUR?	Yes No	Why Not:	
Is it likely to result in the reduction of use or byproduct per unit of product?	Yes No	Why Not:	
Is it Technically Feasible?	Yes No Evaluation Incomplete	Why Infeasible OR Reason feasibility evaluation could not be completed, remaining research steps and schedule	
Identification Procedure (describe)			
<b>Technique 2 Description</b>			Date Identified
TUR Type (Circle)	<input type="checkbox"/> Input Substitution <input type="checkbox"/> Product Reformulation <input type="checkbox"/> Production Unit Modification <input type="checkbox"/> Production Unit Modernization <input type="checkbox"/> Improved Operation and Maintenance <input type="checkbox"/> Integral Recycling		
Covered Toxic(s) Addressed (List)			
Is it Legal?	Yes No	Why Not:	
Does it meet the definition of TUR?	Yes No	Why Not:	
Is it likely to result in the reduction of use or byproduct per unit of product?	Yes No	Why Not:	
Is it Technically Feasible?	Yes No Evaluation Incomplete	Why Infeasible OR Reason feasibility evaluation could not be completed, remaining research steps and schedule	
Identification Procedure (describe)			

# Reviewing past TUR opportunity ideas

- Any past TUR opportunity identified but deemed infeasible must be revisited – things change!
  - Economics
  - Technical performance
  - Facility capabilities
  - Customer demands
  - Regulatory or other restrictions
- If clearly infeasible and unlikely to ever be deemed otherwise, document your justification for no longer reassessing the option
  - *Use caution here!*



# Don't forget these TUR opportunities

Improved O&M associated with:

- Spills, leaks, spoilage/scrap, storage, transfer activities

Implementing closer process monitoring

Using better production metrics to improve process efficiencies

Implementing employee training in TUR

Improving product quality consistency to minimize waste

Involving R&D and engineering in TUR and long range product/process planning

Working with vendors to eliminate covered toxics

Continuing dialog with customers on safer choices

# Conduct Technical Evaluation

## Determine if Option is TUR

Is it one of the 6 TUR techniques?

no

yes

Is substitute more toxic?

yes

no

Does it shift the risk?

yes

no

Is it likely to reduce use or byprod\*?

\* Per unit of product

yes

no

**STOP**

Explain why not in your TUR Plan  
Save your analysis

**Calculate** expected reductions in use and byproduct (*total and per unit of product*)

**Collect** information for economic feasibility determination

**Draft** implementation timeline

## Determine Economic Feasibility

## Determine if Option is Technically Feasible

Is it legal?

no

Is it *technically* feasible<sup>‡</sup>?

no

yes

- ‡ Will it impact product quality negatively?
- ‡ Can customer and quality specifications be met?
- ‡ Is it reliable and stable?
- ‡ Is there sufficient physical space?
- ‡ Does the technology work at scale?
- ‡ Does the technology exist?
- ‡ Are worker skills adequate?
- ‡ Is required training feasible?
- ‡ Are there other technical issues that could limit feasibility?

## EXHIBIT 6 - OPTIONAL CHART: EVALUATION OF TECHNICALLY FEASIBLE OPTIONS

PRODUCTION UNIT:				
Technique Description				Date Identified
TUR Type	Input Substitution	Product Reformulation	Production Unit Modification	Production Unit Modernization
	Improved Operations and Maintenance	Integral Recycling		
Covered Toxic(s)				
Projected Reductions in Use and Byproduct (append calculations with location of supporting documentation)	Projected Reduction (when fully implemented)		Annual	Per Unit of Product
	Use			
	Byproduct			
Is it Clearly Economically Infeasible	Yes	No	If Yes, show economic rationale:  Estimated Cost of Implementation:  Maximum Possible Savings from Eliminating Chemical Use (from cost of toxics and projected reductions in use and byproduct):	
Has the company already implemented it or decided to implement it without a full economic analysis?	Yes	No	Estimated cost of implementation: (attach calculations and supporting documentation if any)	
			Estimated savings (from the cost of toxics and projected reductions in use and byproduct)	
Is it Economically feasible?	Yes	No	Attach Economic Evaluation	
Is additional time needed for evaluation	Yes	No	If Yes, explain why and provide an implementation schedule	
Will it be Implemented?	Yes	No	If No, explain why not: or If Yes provide and implementation schedule	

# Which is NOT a good faith reason to reject an option as technically infeasible?

Technology not proven in our industry sector

Another company experienced reduced quality using it

Requires utilities not currently available.

Product manual is in foreign language.

New method shifts emissions from workplace to outside atmosphere.

Bad past experience with vendor.

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# Special notes on technical evaluations

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Evaluation complete when team has enough information to determine that the technique is clearly infeasible, not legal and/or does not = TUR

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Should be commensurate with how the facility evaluates other production processes

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If can't complete by due date of Plan/Plan Summary, explain why and ID steps that will be taken, with dates

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*Remember that TUR options not feasible two years ago may be now*

# Bench scale/pilot testing options



## Identify potential unknown issues

- Quality
- Impact on other processes
- Worker health & safety issues
- Regulatory impacts

## Gather appropriate data

## Tweak process accordingly

This will help in making the business case for adoption



# Economic evaluation



Determine the costs and savings associated with implementing each feasible TUR option

Gather enough information needed to make a good faith and reasonable decision whether to implement

An option may be declared economically feasible even if it doesn't meet the facility's current investment criteria

**BUT**

It must be deemed economically feasible if it does meet those criteria

## Conduct Economic Evaluation

- Calculate costs of adopting the option
- Calculate the savings from the associated reductions in use and byproduct
- Consider all of the quantifiable and unquantifiable costs that are relevant to the decision

**Determine if option is economically feasible**  
using company's normal financial decision-making criteria.  
The analysis only needs to be as detailed as necessary to make a good faith business decision that it is or is not economically feasible.

Is option *financially* feasible?

no

**Explain**

why not in TUR Plan

**Save**

a record of the decision and analyses as documentation

yes

**Decide if option will be implemented**  
using company's normal decision-making criteria  
**Save**  
analyses as documentation

Will option be implemented?

no

**Explain**



why not in TUR Plan

**Save**

analyses as documentation

yes

**Develop implementation schedule**  
Estimate change in use and byproduct.



# What economic metric does your company use most when evaluating new projects?


Net present value (NPV)

Simple payback

Return on investment (ROI)

Other

I don't know



**If the NPV of a project is greater than zero the expenditure  
is financially feasible**

---

True

False

**What is the present value of a \$10,000 capital inflow 4 years from now if the company discount rate is 4%?**

\$10,000

\$8,550

\$11,700

# Additional requirements for economic evaluations

Must be based on the costs of using the covered toxic in the calendar year prior to the planning year.

- Allocate this cost to the production unit as accurately as possible

If decision to implement is independent of the economic analysis, provide a rough estimate of the net costs of implementation

Describe the financial factors used in the analysis (e.g., discount rate, cost of capital, depreciation rate, payback period, etc.)

- Use the same factors used in other financial decisions at the facility for capital budgeting decisions
- Criteria may be less stringent, but cannot be more stringent

Update this information with each Plan Update

# Options selection and implementation planning

Decide if any new options will be implemented

- Develop an implementation schedule

Identify which options require additional evaluation

- Explain why
- Develop an evaluation schedule

Explain why any feasible options are not being implemented

Document rationale for prioritizing options to implement if multiple options identified

## EXHIBIT 7 – OPTIONAL FORM FOR REQUIRED ECONOMIC EVALUATION OF TECHNICALLY FEASIBLE OPTIONS (INCLUDES COST OF TOXICS)

Attach Additional Calculations, Assumptions etc.

Location of Supporting Documentation:					Option Name:				
Production Unit #		# of Products per Year			Expected % Reduction in Use:				
Allocation of shared costs to Production Unit/Chem:					Date Prepared/Reviewed/Updated:				
Covered Toxic Name and CAS:									
CURRENT COST OF TOXICS					COST OF IMPLEMENTING TECHNICALLY FEASIBLE OPTION				
COST ELEMENT <small>(from 310 CMR 50.46a (1) (a-g) and (2))</small>	Comments	Is the cost element relevant (and quantifiable)? If No, explain	Annual \$	\$/ Unit of Product	Is the cost element relevant? If No explain	One Time \$	Annual \$	\$/ Unit of Product	Net Savings or Expense from Option <sup>2</sup>
<b>Manufacturing Costs</b>									
(a) direct labor									
(a) indirect labor									
(b) purchase of covered toxic or its precursors									
(a) materials									
(c) equipment (including cost of capital if relevant)									
<b>(d) Storage, accumulation, treatment, disposal, and handling costs associated with toxics and byproducts</b>									
<b>Raw Material Storage Costs</b>									
(a) direct labor									
(a) indirect labor									
(a) materials									

<sup>2</sup> Consider Cost of Implementation and Reduced Chemical Costs



# Factors that could limit adoption of safer alternatives – *How would you address these scenarios?*

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Lack of worker or management awareness of health impacts

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Weak regulations/Lack of regulatory drivers for change

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Limited supply chain pressure to “green” your product or process

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Efficiency and quality of currently used processes and materials

---

Familiarity with current materials and processes

---

Cost of alternatives materials or new equipment

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Inadequate/Uncertain availability of alternatives

# What your senior manager must do

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Personally examine the Plan

---

Be familiar with the planning process

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Query key TUR planning team members (those with primary responsibility for its development) to assure the Plan is accurate

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Understand the planning regulatory requirements



As the TUR Planner, be sure that the senior manager certifying the Plan knows and does these things

# What do you do when updating your TUR Plan?


Create a brand new document

Update the electronic format with revision dates

Mark up the original hardcopy with date and initials

Modify only the Plan elements that require change because of changes in production units

Other



# How long are you required to maintain your TUR Plan onsite?

2 years

5 years

7 years

Indefinitely

# Your good faith efforts are essential!

- Refer to and use the regulations, tools and guidance
- Network with your peers and consider their best practices
- Reach out to TURA agency resources for assistance

## Who to Contact:

### MassDEP:

Planning – **Lynn Cain**, 617-292-5711

Reporting – **Walter Hope**, 617-292-5982

**OTA:** **Rich Bizzozero**, 617-626-1080

**TURI:** **Pam Eliason**, 978-934-3142

