



Making the Most of Your TUR Planning Activities

What to Focus on at this Stage of the Planning Process

April 14, 2020
TURA Continuing Education Conference
webinar



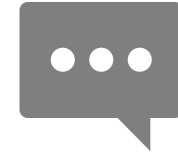
Welcome!



Slides and handouts are available at
[https://www.turi.org/Our Work/Training/Continuing Education/Recent Training Presentations/Continuing Education Webinars Spring 2020](https://www.turi.org/Our_Work/Training/Continuing_Education/Recent_Training_Presentations/Continuing_Education_Webinars_Spring_2020)



Webinar will be recorded – recording available at same location of TURI's website



Use chat box for questions at any time –
Andrea will answer those Qs she can, and we'll find time at the end to answer the rest

TUR Continuing Education Credits

- This webinar has been approved for 3 credits
- To be awarded CE credits from MassDEP:
 - Register and pay for each webinar
 - Participate in polls and breakout rooms
 - Complete the post-webinar survey
- You will receive a certificate of completion once you have met these requirements

Agenda

Remember: 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

Clues from MassDEP on areas of improvement



Highlights from the planning guidance update



Focus on finalizing your Plan



Time Permitting: Q&A with MassDEP on impacts of current situation

Poll #1

Which region is your facility located within?

- Northeast MA
- Greater Boston area
- Western MA
- Central MA
- Southeast MA

MassDEP findings from 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
 - PFD follows chemical rather than being production unit based
 - Documentation associated with materials balances missing or incomplete
 - No TUR option implementation schedule developed

Minor deficiencies noted

Incomplete Scope

- Does not include description of production unit
- Not all covered chemicals identified
- Incorrect CAS# provided

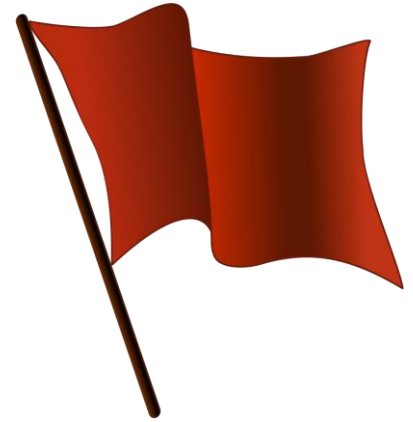
Materials accounting issues

- Chemical use per unit of product not determined
- Discrepancies between chemical use identified in the Plan and what is reported (Form S)

Economic evaluation not thorough

- Cost of toxics not determined per unit of product
- Production unit-based cost analyses missing

Organization inefficiencies noted



No table of contents

Data or tables not clearly labelled

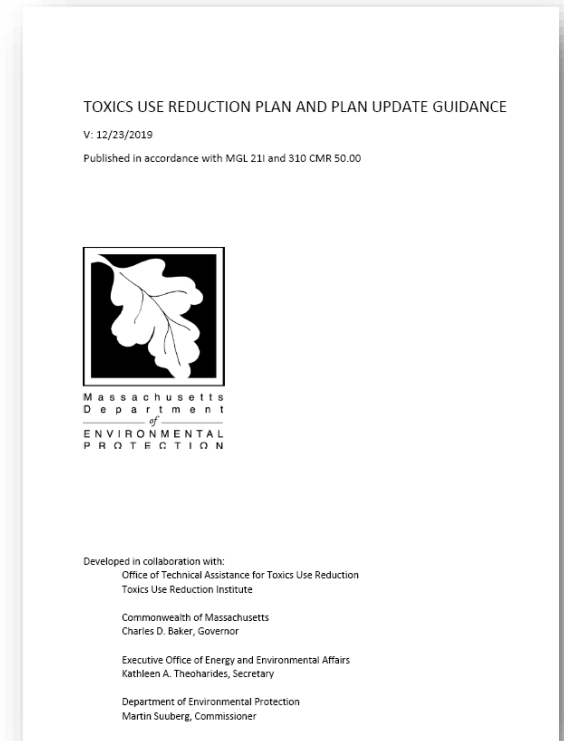
Extraneous documents submitted, such as:

- Safety data sheets
- Form S/R reports
- Standards affecting choices

These are indicators of poor and/or incomplete planning process, and constitute a red flag for MassDEP inspectors

New planning guidance 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/doc/toxics-use-reduction-planning-plan-update-guidance/download>

Poll #2

How far into the Planning process are you
(click each element that you have completed)

- Employees notified
- Process characterization completed/updated
- TUR team has identified options to consider
- Technical feasibility completed
- Economic feasibility completed
- Implementation schedule developed

Accessing necessary information

*Break Out
Discussions*

*10 min
round robin*

- Discuss your strategies and challenges associated with accessing information at this moment in time:
 - Staff for confirmation of process flow
 - TUR team members
 - Data for materials accounting efforts
 - Senior managers for feedback on recommendations and implementation schedule
 - Other needs

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.

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

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

Production unit information required in each Plan

Process flow diagram

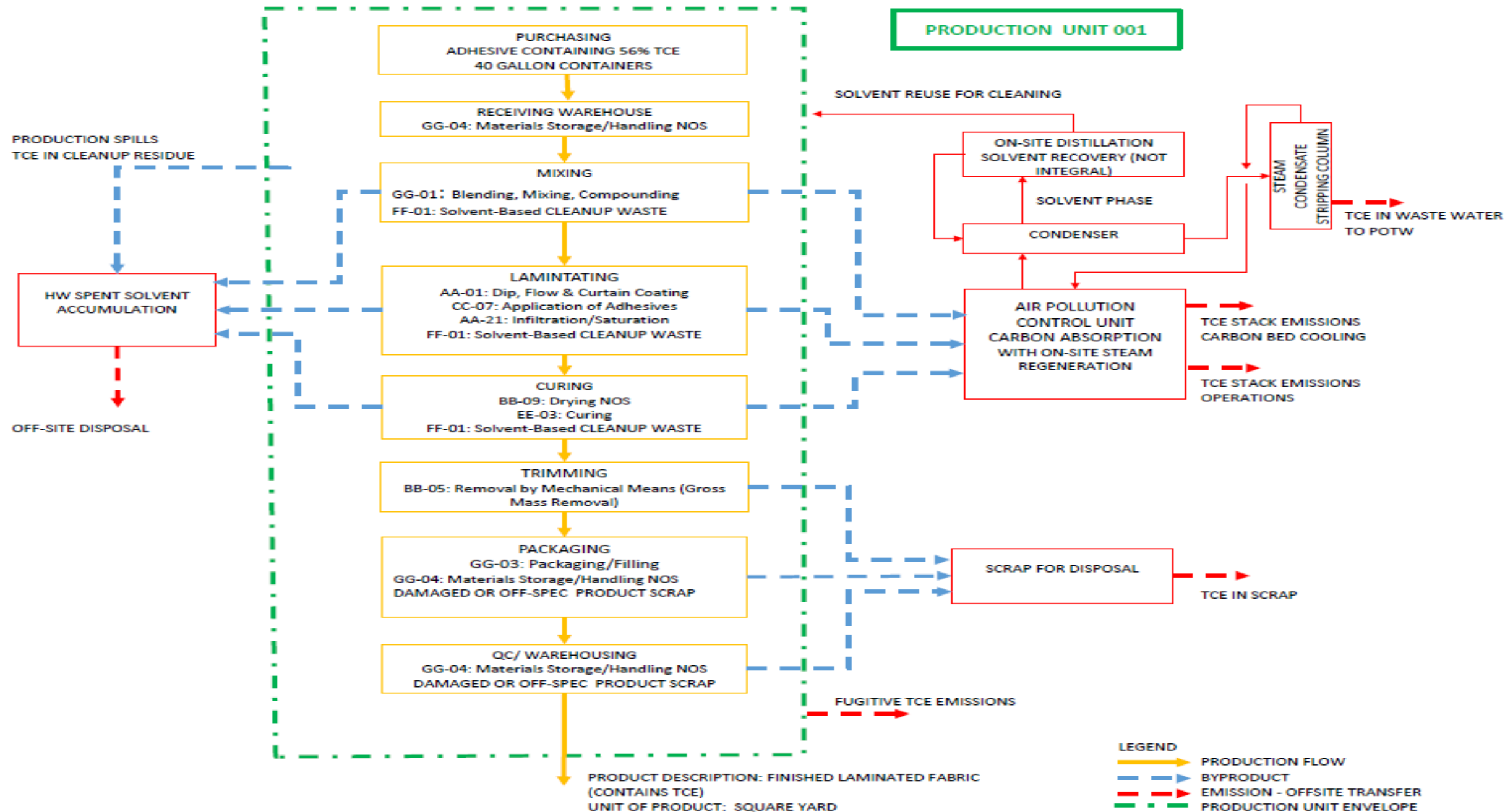
Amounts of use, byproduct and emissions

- 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



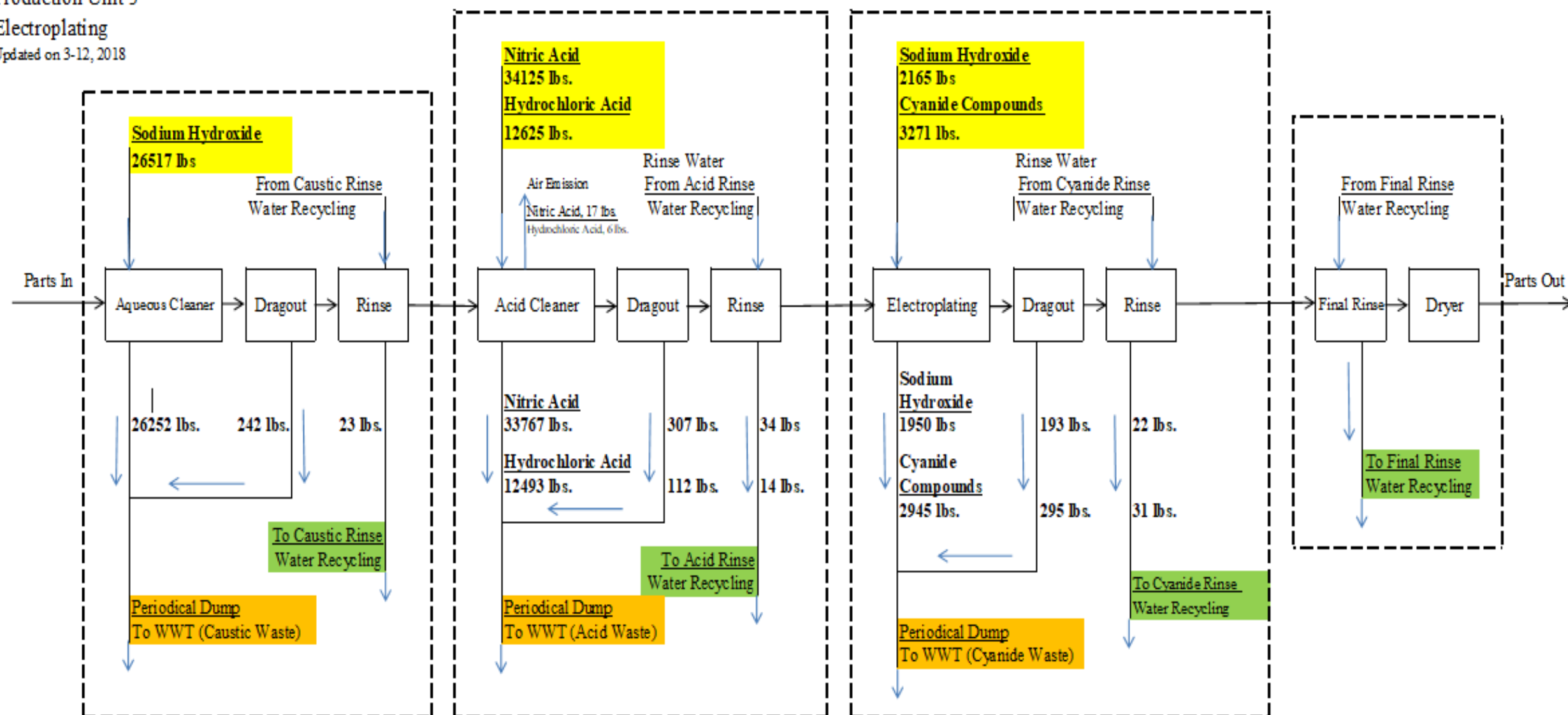
Process Flow Diagram

[310 CMR 50.44(1)]

Production Unit 3

Electroplating

Updated on 3-12, 2018

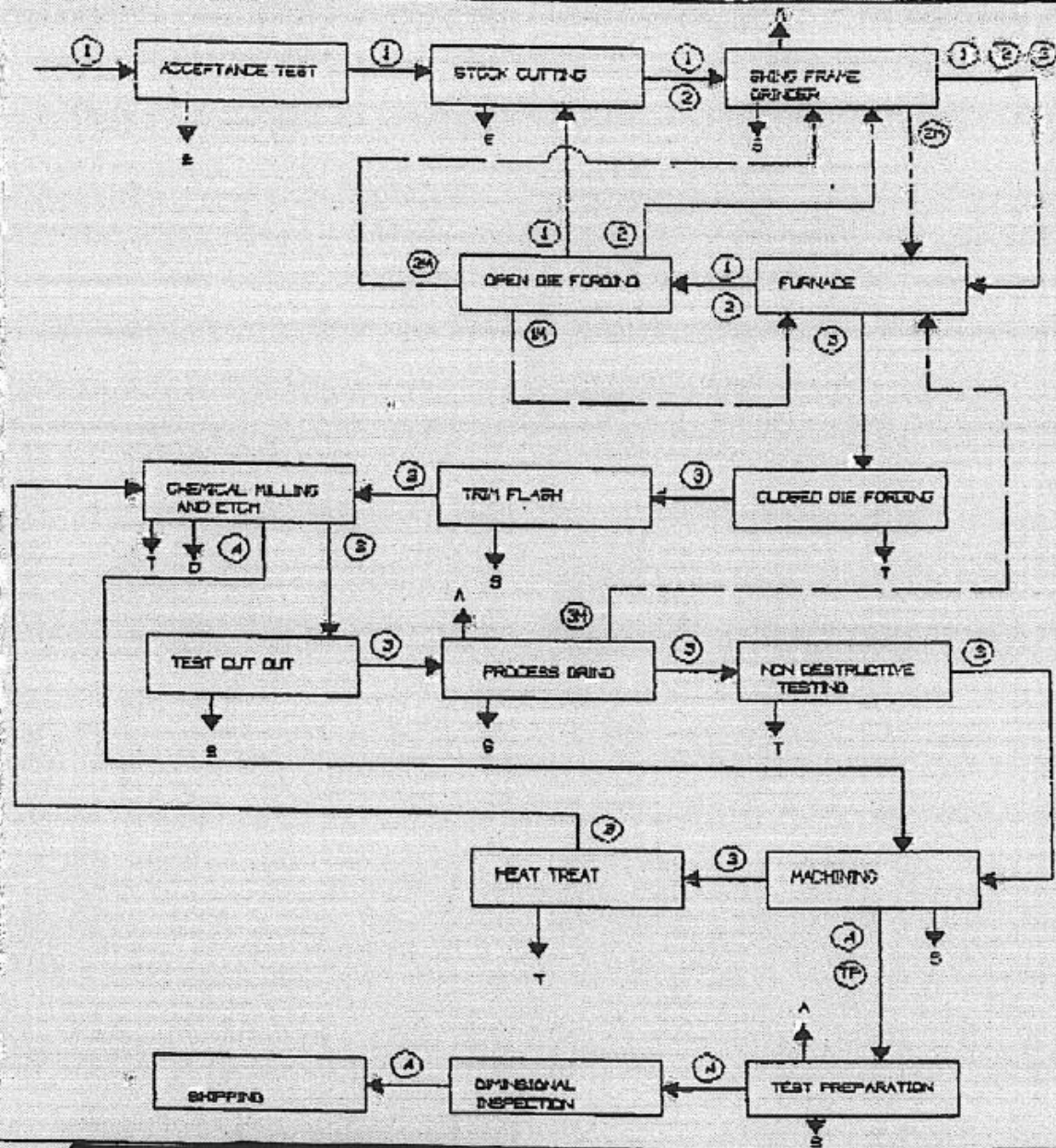


What's Missing?

- Chemical and CAS #
- Emissions and byproduct numbers

What else stands out?

- 1996 PFD with no revision noted
- Copy of a copy of a copy



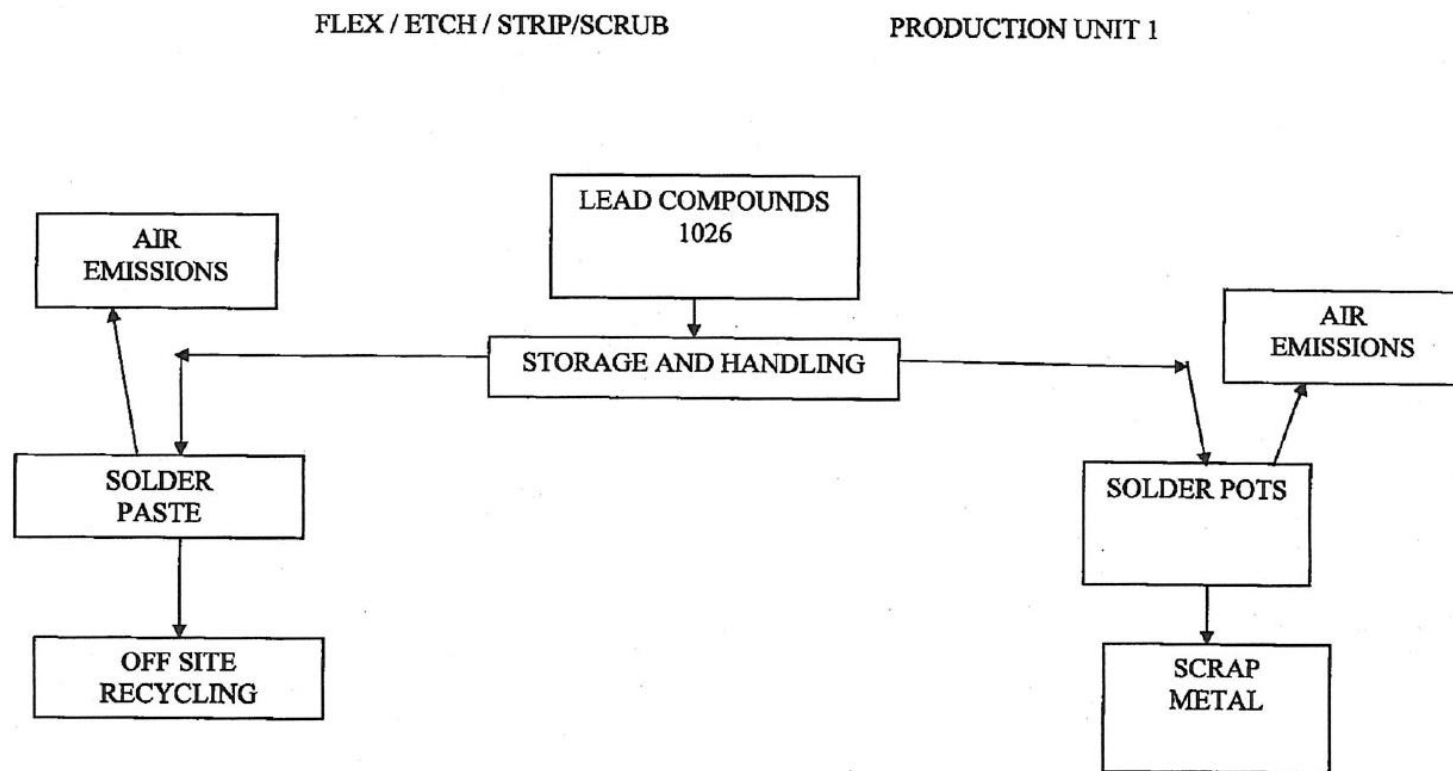
ENGINEERS: B.J.P. / J.W.D.
DATE: JULY 31, 1996

PRODUCTION UNIT # 1

DRWG. NO. GTURP351

1995 TOXICS USE REDUCTION PLAN
ALUMINUM ALLOY FORGINGS
SCHEMATIC PROCESS DIAGRAM

Another example – a simple process flow diagram

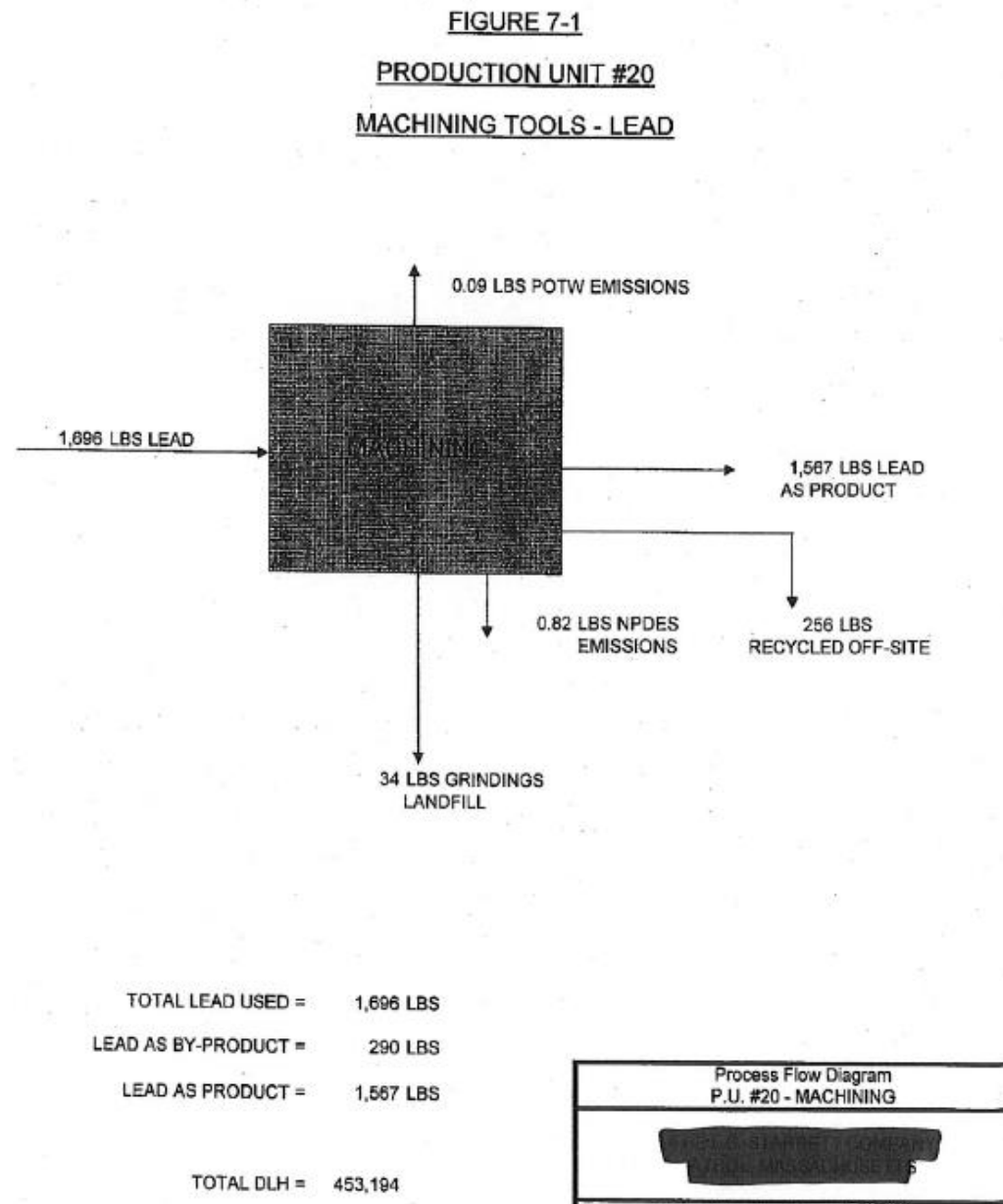


This PFD accurately depicts the process flow

- No use, byproduct or emissions numbers
- No indication of other inputs and outputs (just focuses on one chemical)
- No revision date

And finally ...

- Good numbers for use, byproduct and emissions, but ...
- Overly simplistic
 - No opportunity to consider the overall process flow when seeking opportunities to reduce



Cost of toxics – Focus is on the chemical you hope to reduce at this stage

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 for each Production Unit
- 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

Relevant Costs



Relevant cost elements would change in a meaningful way if the use or waste of the toxic chemical increased or decreased

Remember: Not relevant costs associated with the toxic chemical you are focused on ***may be*** relevant when evaluating a substitute

EXHIBIT 4 - Optional Cost of Toxics Form

OPTIONAL FORM FOR DOCUMENTING COST OF TOXICS EVALUATION [310 CMR 50.46A(7)]					
Create a separate form for each production unit for which there are no technically feasible options					
NOTE: Economic evaluation of technically feasible options must be quantitative					
Production Unit #		Date Prepared/ Reviewed/ Updated		# of Products per Year	
Location of Supporting Documentation				Allocation of costs to Production Unit	
Covered Toxic Name(s) and CAS No.					
COST ELEMENT (from 310 CMR 50.46a (1) (a-g) and (2))	Is the Cost Element <i>Relevant</i> ^s to the Production Unit (Y/N)	If No, explain	If relevant, is it quantifiable? (Y/N) Explain.	IF THERE IS A TECHNICALLY FEASIBLE OPTION	
				Annual Cost/Savings (\$/yr)	\$ / Unit of Product
Manufacturing Costs					
(a) direct labor					
(a) indirect labor					
(a) materials					
(b) purchase of covered toxic or its precursors					
(c) equipment (including cost of capital if relevant)					
Materials and Waste Management Costs					
Raw Material Storage Costs					
(a) direct labor					
(a) indirect labor					
(a) materials					
(c) equipment (including cost of capital if relevant)					
Product Accumulation and Storage Costs					
(a) direct labor					
(a) indirect labor					
(a) materials					

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



Poll #3

Q1: Which TUR technique have you had the best TUR results with?

Q2: Which TUR technique have you seen the most savings with?

- Input substitution
- Product reformulation
- Production unit modernization
- Improved O&M
- Integral Recycling
- Production unit or process redesign/modification

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

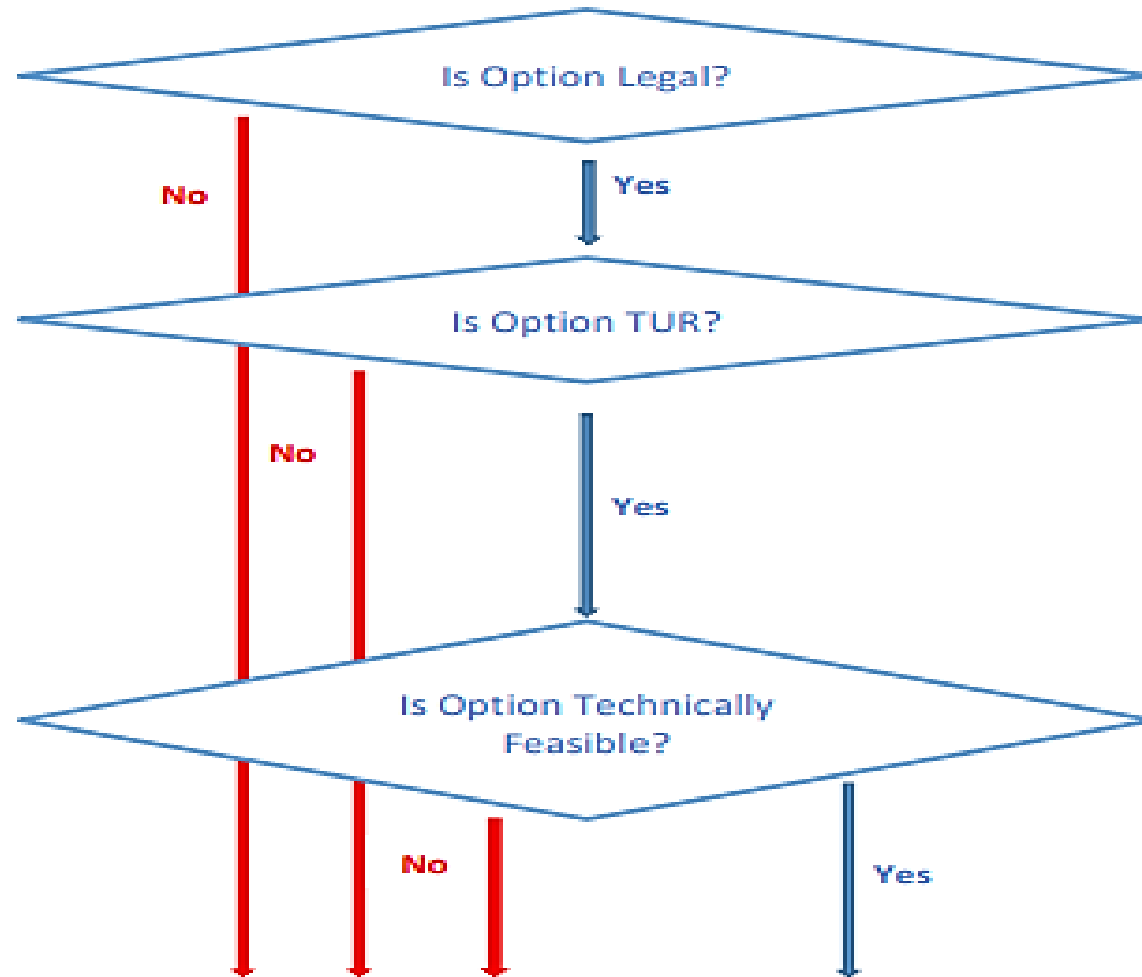
Figure 2: Determining if Option is Technically Feasible
(310 CMR 50.46(1))

Regulatory Citations

310 CMR 50.46
(1)(c)

310 CMR 50.10
and MGL c 21I,
§2

310 CMR 50.46
(2)



Questions to Consider

- Will implementation of option violate any other law/regulation?

- Is it one of 6 TUR techniques?
- Is the substitute less toxic?
- Does it avoid shifting the risk?
- Is it likely to reduce use or byproduct per unit of product?

- Do you have enough information to complete the evaluation?
- Does technology exist?
- Is it reliable and stable?
- Does it work at production scale?
- Will it impact product quality?
- Can specifications be met?
- Is there sufficient physical space?
- Are worker skills adequate?
- Is training required and possible?
- Are there other limiting technical issues?

Figure 2: Determining if Option is Technically Feasible
(310 CMR 50.46(1))

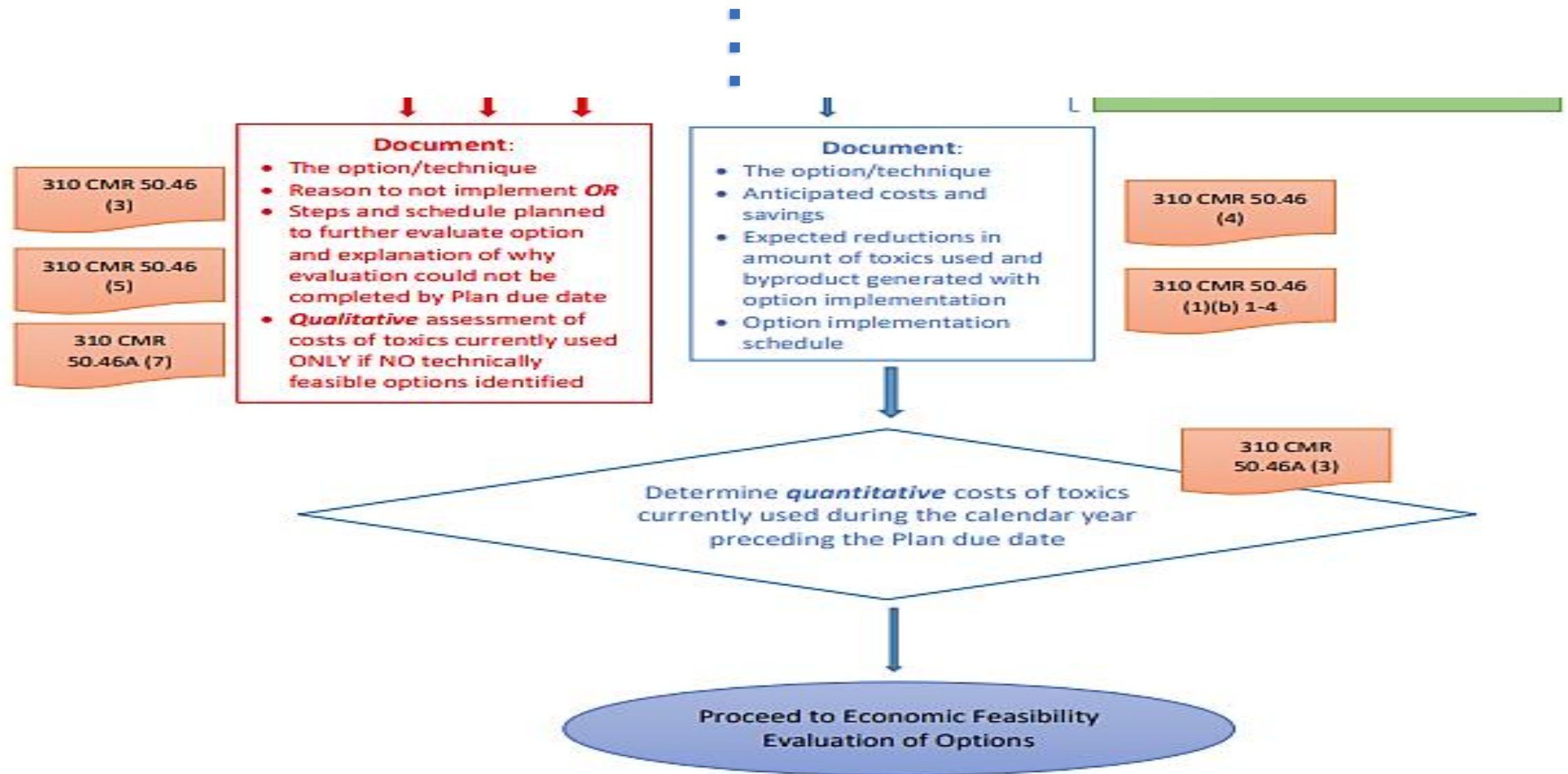


EXHIBIT 6 - OPTIONAL CHART: EVALUATION OF TECHNICALLY FEASIBLE OPTIONS

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	If from Prior Planning Cycle: Date Reevaluated/ Outcome	
	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				

Poll #4

Which are NOT good faith reasons to reject an option? *(click all that apply)*

- 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 outside atmosphere to workplace (or vice versa)
- Bad experience with vendor

Special notes on technical evaluations

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

Should be commensurate with how the facility evaluates other production processes

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

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

Bench scale/pilot testing options

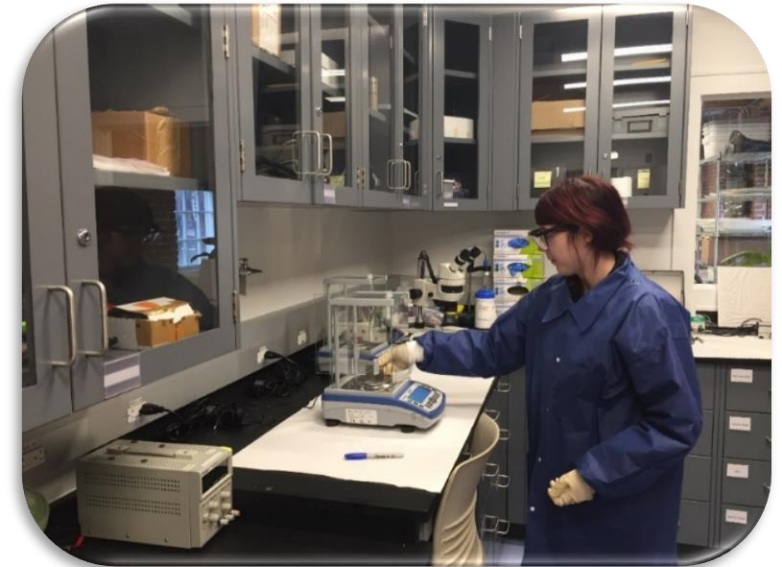
Identify potential unknown issues

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

Gather appropriate data

Tweak process accordingly

This will help in making the business case for adoption



Poll #5

How do you validate that a TUR option is technically feasible?

- In-house R&D bench scale testing
- Onsite production-scale feasibility testing
- Rely on vendor assertions
- Work with TURI Lab (or equivalent)
- Other

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

Figure 3: Determining if Technically Feasible Option is Economically Feasible
(310 CMR 50.46A)

Regulatory Citations

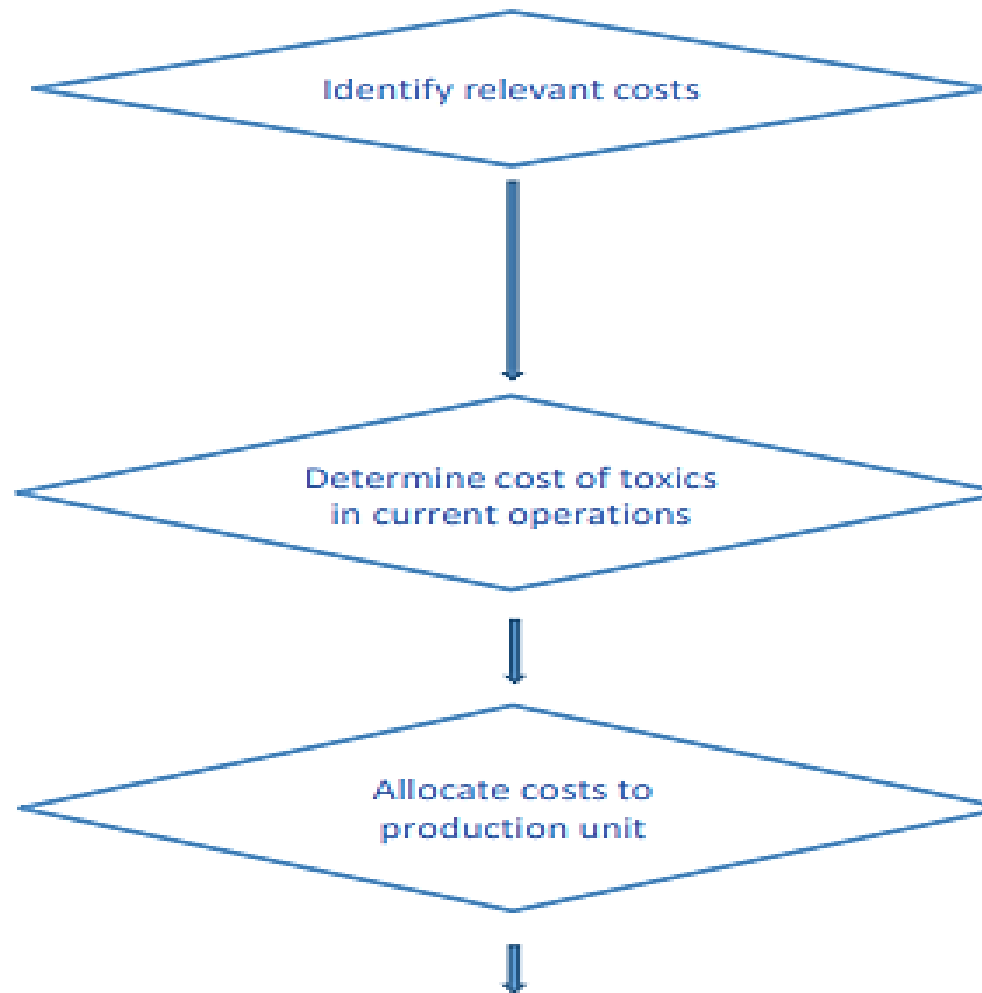
310 CMR 50.46A
(1)(a) – (i)

310 CMR 50.46A
(2)

310 CMR 50.46A
(5)

310 CMR
50.46A (3)

310 CMR
50.46A (4)



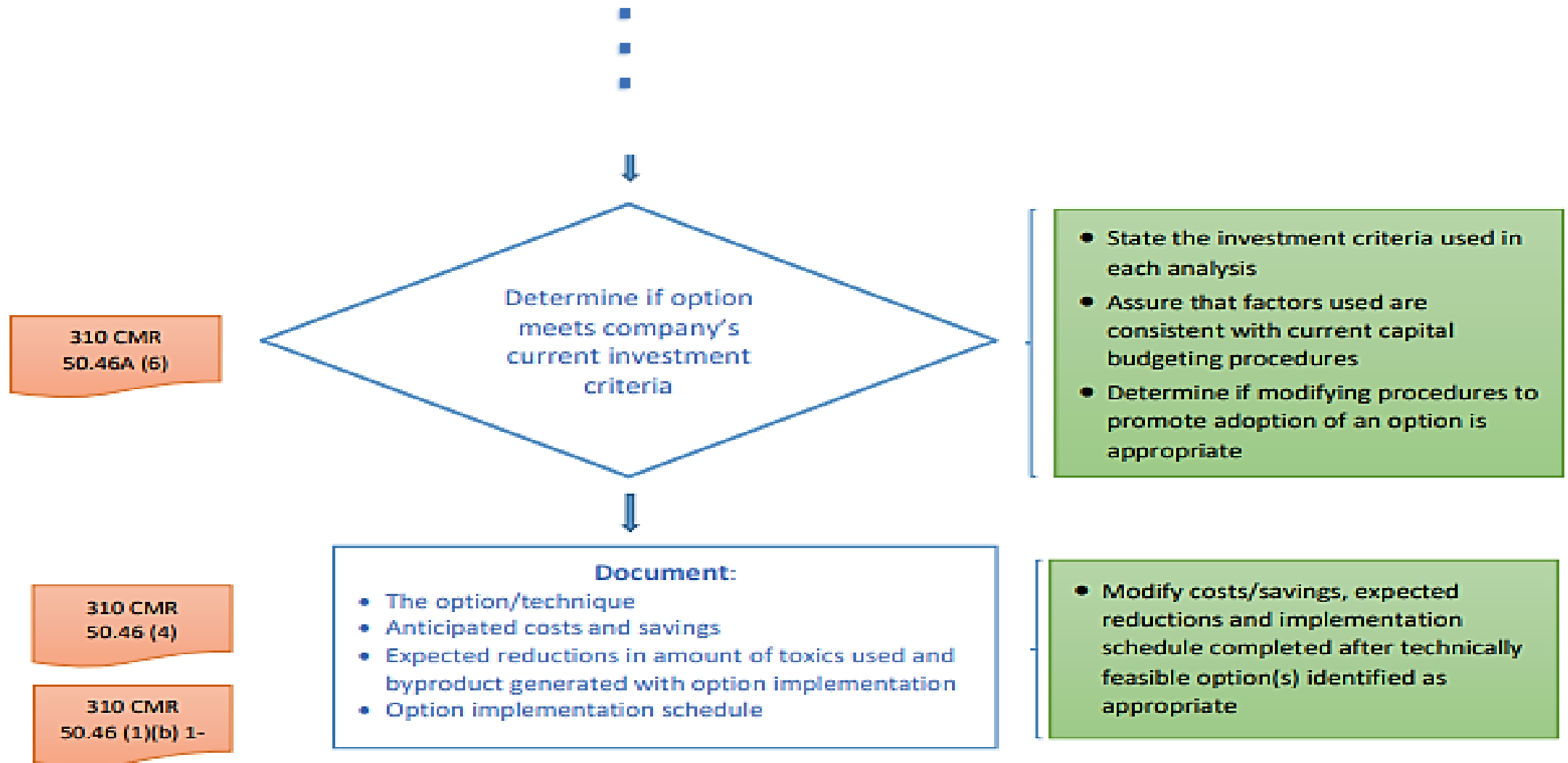
Considerations

- Must consider if items (1) (a)-(i) are relevant
- Explain why any of these costs are not relevant or cannot be reliably quantified.
- Must consider and describe other costs and savings that are relevant if not listed in items (1) (a)-(i)

- This should have been completed after technically feasible option(s) identified
- Determine total cost per year and cost per unit of product
- Calculate based on preceding calendar year information

- Explain allocation method
- Allocation shall be accurate to the extent possible

Figure 3: Determining if Technically Feasible Option is Economically Feasible
(310 CMR 50.46A)



Poll #6

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

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

Factors that might influence which TUR option to recommend for implementation



TUR Impact (use reduction, byproduct reduction, and hazard designation)



Production impact (e.g., interruptions)



Impact on product quality



Investment and pay back



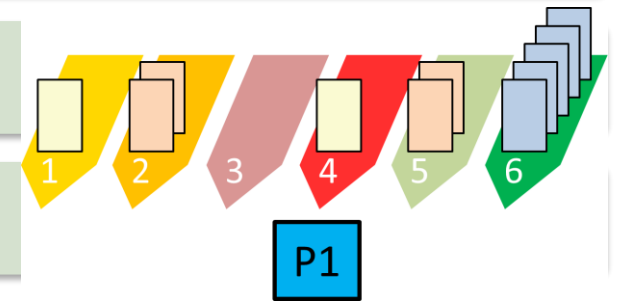
Worker's skill (e.g., training required)



Facility's short- and long-term strategic priorities



Others



What factors limit adoption of safer alternatives at your facility? How are you addressing these in your planning process?

*Break Out
Discussions*

*5 min round
robin*

Lack of worker or management awareness of health impacts

Weak regulations/Lack of regulatory drivers for change

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

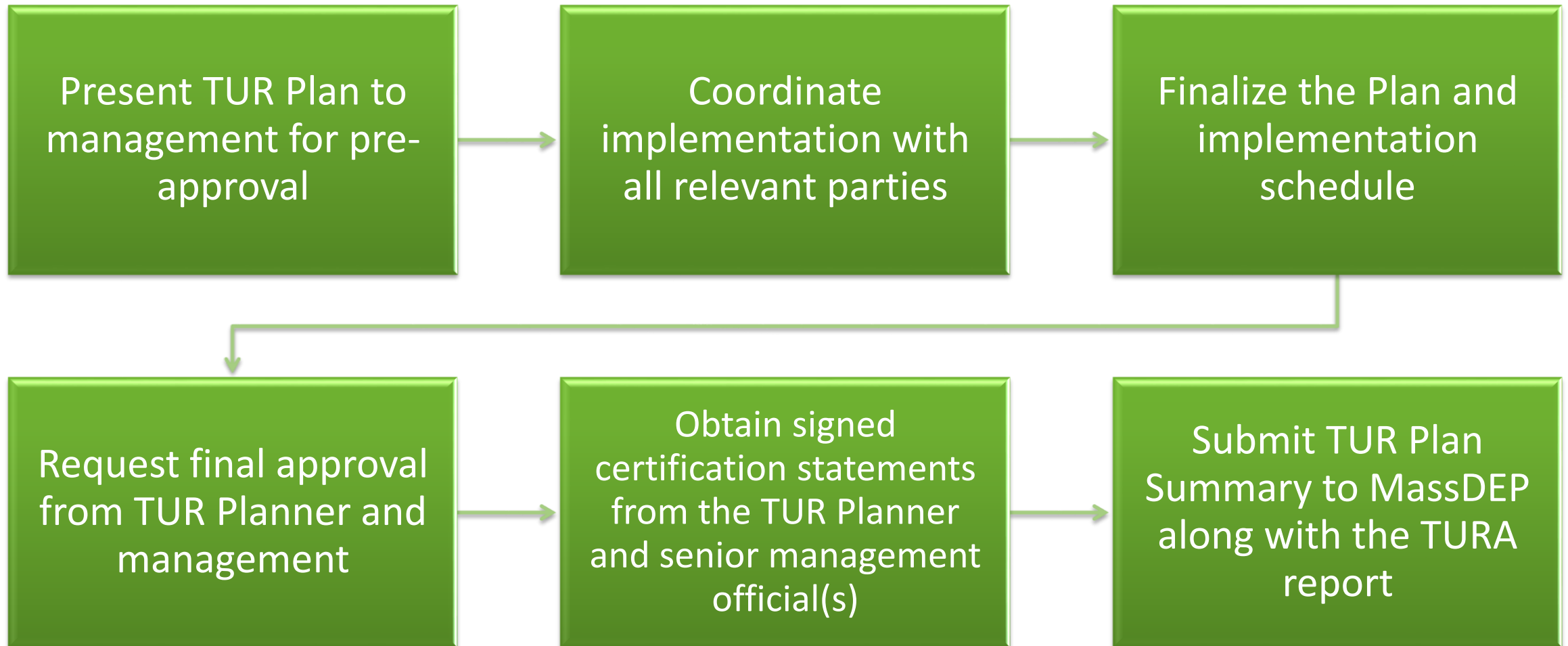
Efficiency and quality of currently used processes and materials

Familiarity with current materials and processes

Cost of alternatives materials or new equipment

Inadequate/Uncertain availability of alternatives

TUR Plan Finalization



What your senior manager must do

1. Personally examine the Plan
2. Be familiar with the planning process
3. Query key TUR planning team members (those with primary responsibility for its development) to assure the Plan is accurate
4. Understand the planning regulatory requirements



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

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

Office of Technical Assistance 617-626-1080

TURI: Pam Eliason, 978-934-3142

Q&A with MassDEP

- Because of the uncertainty of the times we are in, we recognize that many of you may have questions about the impact on reporting and planning compliance
- MassDEP will remain online with us after the session to address specific questions
- Attendance at this point is not a requirement to demonstrate completion of this virtual session