

TURA List of Toxic or Hazardous Substances

Background Document for discussion by the TURA Ad Hoc Committee, April 29, 2021

Introduction

The TURA Ad Hoc Committee has been convened in order to review and strengthen the effectiveness and value of TUR planning to Massachusetts businesses while ensuring ongoing progress in reducing the use of toxics in the Commonwealth and increasing the adoption of safer materials. The Ad Hoc Committee has been asked to address five focus areas. This background document provides information on one of these focus areas: the TURA list of Toxic or Hazardous Substances.

Chemical list: Overview

The TURA List of Toxic or Hazardous Substances was originally created by combining two federal lists: the Toxics Release Inventory (TRI) list created under the Emergency Planning and Community Right-to-Know Act (EPCRA 313) and the list of Hazardous Substances under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

There are over 1600 substances on the TURA list, including 60 categories. Of these 1600 substances, including the categories, a total of 308 have been reported at any time in the TURA program's history.

The list was designed to be updated regularly over time, in tandem with updates to the federal lists upon which it was originally based. The statute provides for the Administrative Council to update the list yearly based on any changes to the TRI or CERCLA lists. In addition, independent of any federal changes, the Administrative Council can add or remove substances, drawing upon input from the Science Advisory Board, the Advisory Committee, and TURI.

Listings. Over time, a number of updates have been made as a result of changes to federal lists. The updates to TRI are described in an [EPA document](#).¹ For example, a substantial number of additions were made in 1995. As required under TURA, all the updates to TRI have been incorporated into the TURA list as well. However, the total number of updates has been relatively small. Between 1995 and 2019, fewer than 30 substances (including individual chemicals as well as categories) were added to the TRI list.

Most recently, the National Defense Authorization Act of 2019 required EPA to add a set of individual PFAS chemicals under TRI. In 2020, responding to this requirement, EPA added 172 PFAS chemicals to TRI, with a reporting threshold of 100 lb/year. Based on the statutory requirement for automatic updates to TURA, these chemicals have been added under TURA, effective for reporting year 2021, with a reporting threshold of 100 lb/year. As of April 2021, three additional PFAS have been added under TRI, and these will be added under the TURA program as well.

As of April 2021, over the life of the TURA program, three substances have been added to the TURA list beyond those that were added automatically as a result of changes to federal lists. Crystalline silica was added in 2000; n-propyl bromide (1-bromopropane) was added in 2009; and the C1-C4 Halogenated Hydrocarbons/Halocarbons Not Otherwise Listed (C1-C4 NOL) category was added, effective in reporting year 2019.

The TURA program's listing of nPB occurred ahead of the addition to TRI and action in other jurisdictions, so the TURA program was able to address the substance earlier than other regulatory programs. The purpose of adding the C1-C4 NOL category was to avoid regrettable substitutions of similar but unlisted chemicals.

More recently, a Per- and Polyfluoroalkyl Substances Not Otherwise Listed (PFAS) category has been recommended for listing by the Science Advisory Board and TURI. The Administrative Council is expected to vote on this listing in 2021. If the Administrative Council votes in favor of the listing and regulations are completed in 2021, the listing will be effective in 2022, with the first planning cycle required in 2024.

In June 2020, the TURA program received a petition to list single-walled carbon nanotubes, multi-walled carbon nanotubes, and carbon nanofibers. This was a follow-up to a 2016 request from a coalition of advocacy organizations that requested that the TURA program review the options for addressing hazards from engineered nanoparticles more generally. The TURA program's petition process is described in a [summary document](#).

Delistings. Over the same time period, a number of substances have also been removed from the TURA list, beyond those that were delisted automatically as a result of changes to federal lists. The TURA program has received 18 delisting petitions; of these, 14 have been granted, at least in part, while others have been denied.

For a summary of listing and delisting decisions over time, see Appendix A.

Substances not reportable to MassDEP. Certain substances are listed under TURA but are not currently reportable based on MassDEP reporting guidance. Specifically, MassDEP reporting guidance established in 1993 provided that categories drawn from the CERCLA list that do not have CERCLA reportable quantities would not be reportable under TURA. These categories include the phthalate esters, haloethers, halomethanes, and nitrosamines.²

In an effort to address these categories, in 2012, MassDEP requested that the TURA SAB review the phthalate ester category and make a recommendation on whether this guidance should be changed to require reporting. Under the existing instructions, phthalate esters that are individually listed, such as DEHP, are reportable, but others that are not individually listed are not reportable. The result was a [report](#) which helped define the category and human health effects of a range of phthalate esters.³

As noted below, in TURI's review of substances on other authoritative lists, certain phthalate esters appeared frequently as examples of chemicals that are prioritized in other jurisdictions and that are not currently reported under TURA.

2006 amendments

The 2006 amendments to TURA created the authority to designate Higher and Lower Hazard Substances within the larger list of Toxic or Hazardous Substances. These designations help Massachusetts companies and communities, as well as TURA program agencies, focus their toxics use reduction efforts on those chemicals that pose the most serious threats to health and safety and the environment.

The Higher Hazard Substance designation lowers the threshold for reporting, planning, and paying TURA fees to 1,000 pounds per year. Persistent, bio-accumulative, and toxic (PBT)

substances, as defined by EPA, which have lower reporting thresholds, are also automatically designated as Higher Hazard Substances. Table 1 shows the full set of Higher Hazard Substance designations that have occurred as of April 2021.

Table 1: Higher Hazard Substance Designations
Trichloroethylene (2008)
Cadmium (2008)
Cadmium Compounds (2008)
Perchloroethylene (2009)
Formaldehyde (2012)
Hexavalent Chromium Compounds (2012)
Methylene Chloride (2014)
Dimethylformamide (2016)
N Propyl Bromide (2016)
Hydrogen Fluoride (2016)
Cyanide Compounds (2016)
2,4-Toluene Diisocyanate (2017)
2,6-Toluene Diisocyanate (2017)
Toluene Diisocyanate, mixed isomer (2017)

The Lower Hazard Substance designation eliminates the per-chemical fee. Reporting and planning requirements for these chemicals are unchanged. Table 2 shows the full set of Lower Hazard Substance designations that have occurred as of April 2021.

Table 2: Lower Hazard Substance Designations
Isobutyl alcohol (2009)
Sec butyl alcohol (2009)
N butyl alcohol (2009)
Ferric chloride (2010)
Ferrous chloride (2010)
Ferric sulfate (2010)
Ferrous sulfate (2010)

Ferrous sulfate heptahydrate (2010)
Butyl acetate (2010)
N butyl acetate (2010)

The 2006 amendments also directed the Administrative Council to review and make decisions on all the substances that had originally been drawn from the CERCLA list. After a lengthy review by the SAB, the Administrative Council came to the decision that most of the substances should be retained on the TURA list.

Other changes to the TURA list

Thresholds. The threshold for reporting under TURA is 25,000 lb/year for substances that are manufactured or processed and 10,000 lb/year for substances that are otherwise used. The threshold is 1,000 lb/year for Higher Hazard Substances, except for TRI PBTs, which have lower thresholds (adopted by EPA in 2000 and 2001).

The 2006 amendments created a change in the program’s approach to thresholds. Prior to the amendments, if any substance triggered any threshold, then all substances at the facility became subject to a 10,000 lb threshold. The 2006 amendments eliminated this provision. This change led to a substantial decrease in TURA reports: Form S submissions decreased by more than 400 submissions per year (about 20%) after this statutory change. (A Form S submission is a chemical use report submitted by a Massachusetts facility under TURA.) A total of 1,567 Form S’s were submitted in 2018.

Alloy delistings. A series of decisions were made in 1995 to de-list a number of metal alloys, except where they are present as aerosols. Specifically, nickel, chromium, copper, manganese, and cobalt in alloy form were delisted.

SAB Process

In considering the TURA list, it may be helpful to understand the typical process by which the SAB conducts its background research and develops a recommendation. When the SAB takes up consideration of a substance, TURI staff members collect a wide range of information related to safety, human health, and the environment. For an example of the Environmental Health and Safety (EH&S) summaries created for the SAB work, see the EH&S summary that was created for [perfluorononanoic acid \(PFNA\)](#). In addition, a call for information goes out so that stakeholders can provide additional information. The substance is then discussed over a series of SAB meetings; for some, this could be as few as two meetings and for others it could stretch over years.

For details on the information considered by the SAB, and for background on other aspects of the decision-making process under TURA (including listings, delistings, and Higher or Lower Hazard Substance designations), see [Decision-Making under TURA: Resources for the TURA Administrative Council and Advisory Bodies](#).⁴

Updating the TURA list: Opportunities and Challenges

The TURA list was designed to be updated over time to take account of new scientific information on chemical hazards. The statute provides for the list to be updated in tandem with updates to the federal lists upon which the TURA list originally was based: TRI and CERCLA. In addition, the statute provides for Massachusetts to make its own updates independent of updates to these federal lists.

Substances are added to the TRI list based on EPA-initiated reviews and/or chemical petition processes that have determined the substance can cause cancer or other chronic human health effects; significant adverse acute human health effects; or significant adverse environmental effects. The CERCLA list of hazardous substances draws upon hazardous substance lists defined under several statutes, including the Clean Air Act, the Clean Water Act, and the Resource Conservation and Recovery Act.

Updates to federal lists have not kept pace with scientific evidence that has accumulated on health and environmental effects. In particular, the TRI and CERCLA lists were built from information available in the 1980s. Since that time, the science has evolved rapidly on human health endpoints such as endocrine disruption, cancer and reproductive toxicity. For example, bisphenol A, which is included on the TRI list and is a well-known endocrine disrupting chemical, has been replaced in numerous applications with bisphenol S or bisphenol F.⁵ Both substitutes have also shown to have similar endocrine disrupting effects, but neither has been added to the TRI list. As noted above, between 1995 and 2019, fewer than 30 substances were added to the TRI list. The 172 PFAS chemicals were added to TRI in 2020 only because Congress passed a law that mandated the addition.

At the same time as additions to TRI and CERCLA have lagged, chemical lists in other jurisdictions have grown. Thus, the TURA list is not up to date in comparison with other authoritative lists at the state level (such as California's Proposition 65 list) or in other parts of the world (such as lists created under the EU REACH regulation).

There are important implications of the TURA list not being as up to date as lists in other states or in other countries. Massachusetts residents and workers do not benefit from the full protections that could be achieved through a more complete list. In addition, Massachusetts businesses lack complete information to guide decision making. Massachusetts businesses use the TURA list in many cases to identify chemicals they should avoid or reduce, so to the extent the list is not fully up to date, there is a greater risk of regrettable substitutions.

There are also some challenges associated with the pace of HHS designations. These are discussed in a separate section, below.

Examining state practices: updating and maintaining lists of chemicals of concern

A number of states have issued legislation on toxic chemicals in consumer products and children's products. These laws use lists of priority substances of concern for their implementation. States using such lists include California, Washington, Vermont and Maine, among others. In many cases, these lists were established by drawing upon other authoritative lists. See Appendix A for an outline of authoritative lists that are commonly used by other state toxics programs.

California's *Safer Consumer Products* (SCP) law establishes a process for evaluating chemicals of concern in consumer products and their potential alternatives. A list of Candidate Chemicals was established, from which priority products for consideration under the law are selected. The list was developed using 23 authoritative lists. The SCP program updates the Candidate Chemicals list on a quarterly basis to reflect evolving changes to these 23 lists.

Under Washington's *Children's Safe Products* legislation, children's product manufacturers are required to report to the WA Department of Ecology if their products contain chemicals on a Reporting List of Chemicals of Concern to Children. The list was established by first identifying a Priority Chemicals List through authoritative lists/sources and the scientific literature that met specific criteria/hazard endpoints outlined in the law. The Reporting List was established for those priority chemicals that are found in children's products or have been documented to be present in human tissue (blood, breast milk, etc.). The list is updated through an amendment process, which has occurred twice since the initiation of the program.

Similar to Washington, both Vermont and Maine also have children's products laws that require product manufacturers to report if their products contain chemicals of concern -- Vermont's *Act 188 Relating to the Regulation of Toxic Substances* and Maine's, *Toxic Chemicals in Children's Products* law respectively. Vermont's original list of Chemicals of High Concern to Children was outlined in the legislation itself. However, the law mandated a review to ensure that the list remained current based on updates from authoritative organizations/lists. Maine's law utilizes a prioritization process of three lists: (tier 1) a list of Chemicals of Concern, (tier 2) a list of Chemicals of High Concern and (tier 3) a list of Priority Chemicals. The list of Chemicals of Concern from which each subsequent list is derived was created through the use of authoritative lists. Maine's chemicals of high concern listing is maintained through a 3-year review process required by statute. There is no rulemaking required for changes.

Comparing the TURA list with selected authoritative lists

To inform this background paper, TURI contracted with the Healthy Building Network (HBN) to assist us in comparing the TURA list with 12 authoritative lists, as shown in Table 3. For each list, HBN determined the chemicals that are on the authoritative list and not listed under TURA. This included an analysis of the 60 categories listed under TURA.

Approach to comparing lists. There is overlap among the lists. Thus, the total number of chemicals present on other lists and not present on the TURA list is not equal to the sum of the chemicals listed in the table. The largest list is California's Proposition 65.

For some of the lists, it is straightforward to determine how many substances are present on the list that are not currently reportable under TURA. This is the case for the NTP lists and for the Greenscreen Benchmark 1 list, for example. For others, the comparison is more complicated because of variable definitions of categories.

In counting the number of substances not reportable under TURA, we included substances from the CERCLA categories that are present on the TURA list but not currently reported under TURA based on the 1993 reporting guidance discussed above.

Federal lists. As shown in the table, we compared the TURA list with three lists maintained by the National Toxicology Program: Known to be a Human Carcinogen, Reasonably Anticipated

to be a Human Carcinogen, and Clear Evidence of Developmental Toxicity. These lists contain 25, 60, and 1 substances, respectively, that are not listed under TURA.

International list: IARC. The International Agency for Research on Cancer (IARC) maintains an authoritative list in which chemicals are classified into four categories according to the strength of evidence related to the agent’s ability to cause cancer. We compared the TURA list with two IARC categories: Group 1 (carcinogenic to humans) and Group 2A (probably carcinogenic to humans). These lists include, respectively, 35 and 26 substances that are not listed under TURA.

Within these IARC lists, there are a number of substances that are not likely to be relevant to TURA filers, including substances that are used as pharmaceuticals, and radioactive substances. Thus, the number of IARC 1 and 2A chemicals that would be meaningful if added to the TURA list is likely to be relatively small.

EU lists. We compared the TURA list with three European Union lists: Priority Endocrine Disruptors; REACH restricted substances (Annex XVII) and REACH candidate list of substances of very high concern (SVHCs) for authorization (Annex XIV). (For the REACH list of restricted substances, CMRs and non-CMRs were considered separately because they are treated separately in HBN’s Pharos database.) As shown in the table below, this comparison yields hundreds of substances that are not listed under TURA; the majority are from non-CMR substances that are restricted under REACH.

State lists. We compared the TURA list with lists from four states: California Proposition 65, Maine DEP’s Chemicals of High Concern and Priority Chemicals, Vermont’s Chemicals of High Concern for Children, and Washington state Department of Ecology - Chemicals of High Concern for Children. Proposition 65 had the most substances not on TURA, with 302 Carcinogens and 192 Reproductive Toxicants not reported under TURA.

GreenScreen Benchmark 1. Finally, we compared the TURA list with the list of substances that have been subject to a GreenScreen analysis (produced by Licensed GreenScreen Profilers), and that have been classified as Benchmark 1, the highest level of concern. This yielded 213 substances that are not reported under TURA.

	Authoritative List	Details	Number of substances not listed under TURA	Examples/ comments
Federal	NTP	Known carcinogen	25	
		Reasonably anticipated carcinogen	60	
		Clear Evidence of Adverse Effects - Dev Tox	1	DIDP ^a
International	IARC	Group 1	35	Includes a number of pharmaceuticals;

				radioactive materials; and fibrous minerals
		Group 2A	26	Methyl methanesulfonate
EU lists	EU - Priority Endocrine Disruptors		125	Dicyclohexyl phthalate ^a
	EU REACH Restrictions (Annex XVII) CMRs	Cancer	Category 1: 187 Category 2: 702	Category 1 example: benzidine salts Category 2 example: hydrocarbon distillates and fractions
		Mutagenicity	Category 2: 393	Example: hydrocarbon distillates and fractions
		Reproductive toxicity	Category 1: 6 Category 2: 95	Category 1 example: copper refining sludges, carbon monoxide Category 2 example: tributyl tins
	EU - REACH Restrictions (Annex XVII) non-CMRs		433	DIDP ^a , organotins, D4 and D5 (cyclic siloxanes), nonylphenol ethoxylates
EU - REACH SVHCs (Annex XIV)	Includes many subcategories	Carcinogenic, banned: 3 Carcinogenic, candidate:11 Carcinogenic, prioritized:2 ED, equivalent concern:9 Equivalent concern, candidate:64 Equivalent concern, respiratory sensitizing:10 Mutagenic, candidate:8 PBT, banned:7 PBT, candidate:15 PBT, prioritized:3 Toxic to repro, banned:21 Toxic to repro, candidate:37 Toxic to repro, prioritized:17 vPvB candidate: 62 vPvB banned:18 vPvB prioritized: 5	Nonylphenols Phthalate esters ^a (many included under: toxic to reproduction, banned)	
State lists	Maine DEP (Chemicals of High Concern and Priority Chemicals)		16	vPvB prioritized includes: Octamethylcyclotetrasiloxane (D4); benzidine salts; nonylphenols and

				nonylphenol ethoxylates not in TRI categories
	VT - Chemicals of High Concern for Children		47	Bisphenol S, several phthalate esters ^a
	WA Dept of Ecology - Chemicals of High Concern for Children		41	e.g. Bisphenol S, several phthalate esters
	California Proposition 65	Cancer	302	TCEP, Tris(2- chloroethyl)phosphate (TCEP - flame retardant); benzidine salts
		Reproductive toxicity	192	Several pharmaceuticals DIDP ^a
Other	Greenscreen - Benchmark 1		213.	DINP ^a Quaternary ammonium compounds, benzyl -C12- 16 -alkyldimethyl chlorides
^a On TURA list as part of CERCLA phthalate ester category, but not reportable due to 1993 reporting guidance				

Table 4 shows similar information in an alternative format. In this table, we have selected a few examples of substances that are present on several other lists, but that are not currently reported under TURA. DIDP is part of the phthalates category, so as part of that category it is on the TURA list, but it is not currently reportable. The other substances shown here are not listed under TURA.

Table 4: Examples from comparative review of lists		
Substance	Lists where included: Examples	Additional comments
Diisodecyl phthalate (DIDP)	<i>State:</i> Prop 65 (DEV), VT, WA <i>EU:</i> EU ED, EU REACH non-CMR ^a <i>Federal:</i> NTP (Clear evidence dev)	Listed under TURA, but currently not reportable to MassDEP per 1993 reporting guidance
Octamethylcyclotetrasiloxane (D4)	<i>State:</i> ME, VT <i>EU:</i> REACH Non- CMR ^a , SVHC Authorization list,	TURA Science Advisory Board reviewed in 2016; board suspended review of cyclic siloxanes (D4 and D4), awaiting more information from industry stakeholders
Bisphenol S	<i>State:</i> VT, WA	

Organotin compounds	<i>EU: REACH non-CMR^a Other: GS1</i>	
Tributyltin	<i>EU: REACH CMR^a, REACH non-CMR^a, EU ED</i>	
Benzidene salts and dyes	<i>State: Prop 65, ME Federal: NTP EU: REACH CMR, REACH non-CMR</i>	
^a The “CMR” and “non-CMR” designation for REACH restrictions is used only within Pharos, and refers to subsets of the REACH restrictions category.		

Options for updating the TURA list

Going forward, there are several possible approaches the TURA program could take in order to ensure that the list is sufficiently up to date to provide necessary information to TURA filers and others.

One approach is to draw from authoritative lists, such as those discussed above. This approach could allow the SAB to use its time primarily for review of emerging hazards. Requiring reporting of already listed CERCLA categories would capture some chemicals that show on many authoritative lists (e.g. phthalate esters). It could also be useful for the TURA program to maintain an informational list of lists.

One or more of the lists shown in Table 3 could be used as a starting point for planning a broader update to the TURA list. Depending on which list is used, elements of other lists would be captured as well. For example, if the TURA program were to update the TURA list using the Proposition 65 list, parts of other lists would automatically be captured. Another option would be to start with one of the smaller lists, such as the Greenscreen Benchmark 1 list.

It is also possible that federal lists could be updated more regularly in the future, thus leading to more automatic updates to the TURA list. In 2014, [TURI submitted a petition to EPA](#) proposing the addition of 25 substances to TRI (e.g. formamide); this is still pending.

Timing is a consideration. Scientific review at the SAB level is extensive; for each substance reviewed significant EHS information is collected and reviewed, in addition to calls for relevant information to be submitted by outside experts. Thus, each substance that is reviewed may take 2-3 SAB meetings and the SAB generally meets 5-6 times per year. Additional complications occur when limited hazard information is available on emerging substances.

HHS/LHS designations. Moving forward, there are also decisions to be made about the pace and focus of [Higher and Lower Hazard Substance designations](#). The TURA program has the authority to designate 10 per year in each category. However, to date, the program has averaged one to two designations per year, and there have been no designations in the past four years.) Going forward, the program could continue this pace of designations, or could aim to complete a larger number of designations per year.

Questions for discussion

The following questions will be presented to aid discussion at the April 29 meeting:

Current use of TURA list and other lists

- Do you make use of the TURA list in your work?
- Do you make use of other chemical lists in your work? Which ones? How do those lists compare in breadth and in utility (including format and ease of use)?
- Have you encountered any challenges with interpreting information related to categories?
- If you work with TURA filers, what process do you use for checking what substances a facility needs to report and plan for?
- Have you faced any challenges in locating CAS numbers within the TURA list? Do you have any suggestions about ways to make the TURA list easier to use?
- Are there best practices you would recommend for facilities or others making use of the TURA list, to maximize efficiency and utility?

Potential updates to chemical list

- Building on the information presented in the background document, as well as your own experience, are there particular substances that should be considered a high priority for addition to the TURA list?
- Similarly, are there particular substances that should be considered a high priority for HHS or LHS designation?
- What are the pros and cons of comprehensively updating the TURA list, as compared with making a smaller number of targeted additions over several years?
- Do you have suggestions for how best to prioritize updates to the TURA list?

Other topics

- Do you have input related to current TURA thresholds? For example, how should the TURA program consider thresholds with regard to nanoparticles?

Appendix A: Listing and Delisting Decisions

The table below is drawn from *Decision-Making under TURA*, and has been updated to include delistings that occurred as a result of the review of CERCLA chemicals mandated by the 2006 amendments to TURA.

Listing and Delisting Decisions: Summary of Recommendations and Final Outcome			
Note: All information presented in this document is for background information only, and is not to be used for compliance purposes. For compliance purposes, consult MassDEP and the Executive Office of Energy and Environmental Affairs.			
Chemical	SAB Recommendation*	Supplemental Information on SAB Recommendation	Status or Outcome**
Nickel in alloy form	Delist except for aerosols (less than 50 um)	Unanimous vote.	Reportable only as aerosols (less than 50 um) (delisted except for aerosols)
Chromium in alloy form	Delist except for aerosols (less than 50 um)	Unanimous vote.	Reportable only as aerosols (less than 50 um) (delisted except for aerosols)
Copper in alloy form	Delist except for aerosols (less than 50 um)	Unanimous vote.	Reportable only as aerosols (less than 50 um) (delisted except for aerosols)
Manganese in alloy form	Delist except for aerosols (less than 50 um)	Unanimous vote.	Reportable only as aerosols (less than 50 um) (delisted except for aerosols)
Cobalt in alloy form	Delist except for aerosols (less than 50 um)	Unanimous vote.	Reportable only as aerosols (less than 50 um) (delisted except for aerosols)

Chromium (III) oxide	Delist	Unanimous vote.	Delisted.
Sodium hydroxide	Not delist	Majority decision to not delist. Decision based primarily on its potential for acute toxicity to workers. For specific applications, there may be uses of sodium hydroxide for which there is scientific justification to determine that sodium hydroxide is the least hazardous material and presents the least risk; this should be considered by the Administrative Council.	Delisting petition denied.
Hydroquinone	Delist, except for manufacture	Unanimous vote. Material has moderate to low toxicity.	Delisted.
Butyl benzyl phthalate	Delist. (However, TURI recommended against delisting based on policy considerations.)	Unanimous vote.	Based on policy considerations related to the emerging science on estrogenic activity of phthalates in general, TURI recommended retaining the substance pending further data. The Administrative Council denied the delisting petition per TURI's recommendation.
Ethyl Acetate	Not delist	Unanimous vote. Recommendation based primarily on its potential for acute toxicity to workers.	Delisting petition denied.

Acetic Acid	Delist at concentrations below 12%	Unanimous vote.	Reportable only in concentrations above 12% (delisted for concentrations \leq 12%)
Sodium Hypochlorite	Not delist	Majority decision to not delist.	Delisting petition denied.
Acetone	No recommendation	Board vote was split.	Delisting request denied. Decision to review acetone during upcoming categorization of the list of chemicals. <i>(Note: Acetone later categorized as Less Hazardous)</i>
Zinc oxide	Delist	Unanimous vote.	Delisted.
Copper-silver alloy	Delist copper-silver alloys except for aerosols (less than 50 μ m)	Unanimous vote.	Reportable only as aerosols (less than 50 μ m) (delisted except for aerosols)
Zinc stearate	Delist	Unanimous vote.	Delisted.
Pure copper metal	Delist except for aerosols (less than 50 μ m)	Unanimous vote.	Reportable only as aerosols (less than 50 μ m) (delisted except for aerosols)
Pure silver metal	Delist except for aerosols (less than 50 μ m)	Unanimous vote.	Reportable only as aerosols (less than 50 μ m) (delisted except for aerosols)

Crystalline Silica	List particle sizes less than 10 um	Unanimous vote.	Listed.
n-Propyl Bromide (1-bromopropane)	List	Unanimous vote.	Listed.
Adipic Acid	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
Ammonium Bicarbonate	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
Ammonium Chloride	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
Ammonium Sulfamate	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
Amyl Acetate	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
Maleic Acid	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
Fumaric Acid	Delist	CERCLA substance reviewed after 2006 Amendments	Delisted
C1-C4 Halogenated Hydrocarbons/Halocarbons Not Otherwise Listed (C1-C4 NOL)	List	Unanimous vote	Council voted to list. Regulations in process as of October 2018.

* Except where otherwise noted, TURI supported the SAB's recommendation. ** For date of listing or de-listing, see "MA Toxics Use Reduction Act – Current Chemical List," on the MassDEP website at: <http://www.mass.gov/eea/docs/dep/toxics/approvals/chemlist.pdf>.

Appendix B: Examples of Authoritative Lists

Below are examples of authoritative lists commonly used by state-level toxics program to maintain their chemicals of concern lists. This list is not comprehensive.

California Proposition 65 - Chemicals known to cause cancer and/or reproductive toxicity that are listed under Health and Safety Code section 25249.8 of the California Safe Drinking Water and Toxic Enforcement Act of 1986
European Commission Annex VI CMR [CLP harmonized entries] - Chemicals classified by the European Union as carcinogens, mutagens, and/or reproductive toxicants Category 1A and 1B in Annex VI to Regulation (EC) 1272/2008
European Commission Endocrine Disruption - Chemicals included in the European Union candidate list of Substances of Very High Concern in accordance with Article 59 of Regulation (EC) 1907/2006 on the basis of Article 57(f) for endocrine disrupting properties
European Commission REACH candidate list of substances of very high concern (SVHCs) for authorization (Annex XIV) - Includes CMR, PBT, endocrine disrupting properties, respiratory sensitization properties, specific organ toxicity after repeated exposure or equivalent level of concern.
IRIS Neurotoxicants - Chemicals for which a reference dose or reference concentration has been developed based on neurotoxicity in the United States Environmental Protection Agency's Integrated Risk Information System
IRIS Carcinogens - Chemicals that are identified as "carcinogenic to humans," "likely to be carcinogenic to humans," or Group A, B1, or B2 carcinogens in the United States Environmental Protection Agency's Integrated Risk Information System
EC PBT - Chemicals included in the European Union candidate list of Substances of Very High Concern in accordance with Article 59 of Regulation (EC) 1907/2006 on the basis of Article 57(d), Article 57(e), or Article 57(f) for persistent, bioaccumulative and toxic, or very persistent and very bioaccumulative properties
EC Annex VI Resp. Sens - Chemicals classified by the European Union as respiratory sensitizers Category 1 in Annex VI to Regulation (EC) 1272/2008
IARC Carcinogens - Groups 1, 2A, and 2B carcinogens identified by the International Agency for Research on Cancer
US NTP ROC Chemicals that are identified as "known to be" or "reasonably anticipated to be" a human carcinogen in the 13th Report on Carcinogens , United States Department of Health and Human Services, Public Health Service, National Toxicology Program
NTP OHAT – Repr. Or Dev. Toxicants - Reproductive or developmental toxicants identified in Monographs on the Potential Human Reproductive and Developmental Effects, National Toxicology Program, Office of Health Assessment and Translation

US EPA TRI PBTs - [United States Environmental Protection Agency's Toxics Release Inventory Persistent, Bioaccumulative and Toxic Chemicals that are subject to reporting under the Emergency Planning and Community Right-to-Know Act section 313](#)

US EPA NWMP PBTs - [Persistent Bioaccumulative and Toxic Priority Chemicals that are identified by the United States Environmental Protection Agency's National Waste Minimization Program](#)

OSPAR Priority Action Part A - [Chemicals that are identified on Part A of the list of Chemicals for Priority Action, Oslo and Paris Conventions for the Protection of the Marine Environment of the North-East Atlantic](#)

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