

Toxics Use Reduction Institute

Policy Analysis: Recommendations on CERCLA chemicals that have never been reported by TURA filers

June 16, 2008

Statutory amendments to the Toxics Use Reduction Act (TURA) in 2006 required the Science Advisory Board (SAB) and the Toxics Use Reduction Institute (TURI) to review the substances on the TURA Toxic or Hazardous Substances List originating from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) list and make a recommendation to the Council as to which substances should be retained.

For any substances that are retained, there would be no change in reporting and planning requirements. For substances on which the Council takes no action, those substances would drop off the list.

The SAB considered the CERCLA substances in two broad groups: those that have been reported at some point by TURA filers, and those that have never been reported by TURA filers. This document presents information on those substances that have **never been reported** by TURA filers.

As described below, the SAB has found a scientific basis to recommend retaining the majority of the CERCLA substances that have never been reported by TURA filers. Specifically, of 243 substances considered here, the SAB has recommended that the Council retain 208 and take no action on 35 (meaning that these substances would drop off the list and no longer be reportable under TURA).

In developing its final recommendations, TURI has considered both the SAB's hazard-based recommendation, and several policy considerations.

- One of the original policy objectives of the 2006 TURA Amendments was to simplify the TURA list, making it more similar to the Federal Toxics Release Inventory and focusing attention on the substances of most concern and importance in Massachusetts. This could be accomplished in part by eliminating from the list any substances that were unlikely to be used in quantities above TURA reporting thresholds in the future.
- Other policy objectives include providing clear guidance to industry in assessing alternatives; providing as much information as possible to users of the TURA list; and applying consistent criteria in listing decisions over time. These objectives can be supported by retaining substances that meet the hazard-based criteria applied by the SAB.

As discussed in more detail below, the Council's multi-stakeholder Advisory Committee strongly recommended that TURI's recommendations adhere to the SAB's recommendations, concluding that for this particular situation, the original policy objectives of the 2006 Amendments would have negligible benefits for TURA filers and the program as a whole, and would create significant disadvantages.

Based on this input from stakeholders, TURI supports the SAB's recommendations on all the CERCLA substances that have never been reported under TURA. However, in the event that the Administrative Council chooses to adopt a different approach, this policy analysis also provides chemical use information that can be used to identify those substances that are highest priority for retention.

1. Overview

The TURA list was originally created from two federal lists: the Toxics Release Inventory (TRI) list created by the Emergency Planning and Community Right to Know Act (EPCRA); and the CERCLA list. The CERCLA substances list applies to Superfund hazardous waste sites and chemical accidents and spills. Substances that are found on the CERCLA list originate from four other federal regulatory lists: the Clean Air Act list of hazardous air pollutants (HAPs), the Clean Water Act list of hazardous substances and priority pollutants, the Solid Waste Disposal Act list of hazardous wastes, and the Toxic Substances Control Act list of substances that pose an imminent hazard.¹

There are nearly 500 chemicals on the CERCLA list that do not overlap with the EPCRA list. The majority have never been reported under TURA. In order to make review of this list manageable, the SAB considered the CERCLA chemicals in groups.

- ***Substances listed in categories.*** 173 of the substances currently appear on the TURA list in two forms: as individual listings from the CERCLA list, and as members of categories from the EPCRA/TRI list. Under TURA reporting rules, these chemicals have always been reportable as the EPCRA category. Thus, the individually listed substances can be removed from the TURA chemical list for simplicity, while their reporting requirements remain unchanged.
- ***Substances reported under TURA.*** There are 80 CERCLA-only substances that have been reported at some point under TURA.
- ***Substances never reported under TURA.*** The majority of the CERCLA-only substances have never been reported under TURA. These chemicals have not been used over threshold amounts (10,000/25,000 pounds) during the 16 years for which data are available. Thus, they are not likely to be a priority for the program unless significant new uses emerge or they are potential Higher Hazard Substances for which the reporting threshold might be lowered. These substances are the subject of this document.
 - To facilitate the review process for this large group of non-reported chemicals, TURI and the SAB broke the substances down into eight groups. Five groups (Acetates, Amines, Ammonium Compounds, Benzene-related compounds, and Phenols) are defined by chemical structure. One group (Pesticides) is defined by use category; another group (IARC 1, 2, & 3) is defined by health effects; and a final group (Non-categorized) contains all substances that did not fall into one of the other categories. These groups are listed in Appendix 1, along with information on the SAB's votes on each.

2. Information considered by the SAB

The substances recommended by the SAB for retention pose concerns based on health, safety, or environmental criteria. Specific data for each substance are shown in Appendix 2. In addition to the data shown in Appendix 2, in some instances individual SAB members brought additional scientific information to the meeting. The SAB considered the following data:

- International Agency for Research on Cancer (IARC) rating. The SAB recommended retaining any substance that has an IARC rating (Group 1, 2, or 3)². 64 substances were recommended for retention on this basis.
- Data from the EPA PBT profiler (persistence in water, soil, sediment, and air; bioconcentration factor; and chronic toxicity in fish).³ A number of the substances recommended for retention on the TURA list have a high persistence value in at least one medium.

- Neurotoxicity (based on Scorecard’s list of suspected neurotoxicants, and other sources in some cases).⁴
- Developmental/reproductive toxicity (based primarily on California’s Proposition 65 list, and other sources in some cases).⁵ In general, the SAB recommended retention of substances that appear on California’s Proposition 65 list or for which there are substantial data indicating developmental or reproductive toxicity.
- Mutagenicity (based on the European Union’s Consolidated List of Carcinogens, Mutagens, and Reproductive Toxicants [CMR], and other sources in some cases).⁶ In general, the SAB recommended retention of substances that for which there are substantial data indicating mutagenicity.
- Lethal dose or concentration information (LD50 and LC50). A number of substances were selected for retention on the list based on a low LD50 or LC50.
- Exposure limits required or recommended by federal agencies, including reference dose and reference concentration (RfD and RfC, from EPA Integrated Risk Information System)⁷; ATSDR Minimum risk level (MRL); NIOSH Recommended Exposure Limit (REL); Permissible Exposure Limit (PEL); Threshold Limit Value – Time Weighted Average (TLV-TWA); and Threshold Limit Value – Short Term Exposure Limit (TLV-STEL).⁸ In general, the SAB considered a low REL, TLV (TWA), or TLV (STEL) as a reason to recommend retention.
- Flash point.

In general, for each of the substances the SAB recommended retaining on the TURA list, there was particular concern based on one or more data points. In some cases, the SAB based its recommendation on the fact that there were multiple data points of concern. The SAB recommended no action on those substances for which no significant health or environmental concerns were evident.

3. Approach to developing policy recommendations

One of the policy objectives of the 2006 TURA Amendments was to modify the TURA reportable substances list by simplifying it, making it closer to the federal Toxics Release Inventory, and focusing on the substances of most concern and importance in Massachusetts. TURI initially developed recommendations on the assumption that minimizing the number of CERCLA substances retained on the TURA list was the overriding policy consideration. Thus, in its initial draft recommendations presented to the Advisory Committee, TURI recommended retaining only a subset of the substances that had been recommended for retention by the SAB. TURI’s recommendations were based on expected use patterns; TURI recommended taking no action on those substances that TURI does not expect to be used in significant quantities by TURA filers.

However, there was a strong consensus among Advisory Committee members, including both industry and advocacy representatives, that other policy considerations were more important, and that substances recommended for retention by the SAB should be retained on the TURA list. Members advised against removing substances from the list on the basis of known or expected use patterns. Committee members cited the following policy considerations as the basis for their consensus:

- The TURA list may be used for reference in choosing which substances to avoid. Removal of a substance from the list would implicitly identify that substance as an acceptable alternative to TURA listed substances, and thus could lead to costly errors by facilities attempting to avoid toxic or hazardous substances.
- Removing substances based on expected use patterns may lead to inconsistencies in the list, such as inconsistent treatment of persistent organic pollutants that are slated for international phaseouts.
- Given that the substances are not currently used above threshold amounts, retaining the substances on the list does not lead to any financial costs, either for industry or for program staff.

- From a broader policy perspective, the TURA list may also be used as a reference by other government agencies. Eliminating a substance based on expected use patterns in Massachusetts would diminish the utility of the list for government agencies outside Massachusetts.
- Although the TURA program has made a significant effort to identify likely existing and emerging uses of the substances in question, there are likely to be some emerging uses that the program has not identified.

Based on this input from the Advisory Committee, TURI has revised its recommendations. TURI supports the SAB's recommendations regarding retention or no action, regardless of expected use patterns. However, TURI has included expected use information in this document, in the event that the Administrative Council chooses to prioritize shortening the TURA list as a policy goal. Note that a recommendation to retain a given substance does not indicate that the program necessarily expects the substance to be used in reportable quantities, or to be a program focus area.

4. Sources of Use Information

None of the substances considered here has been reported under TURA in the 16 years of TURA filing, indicating that none has been “manufactured or processed” above 25,000 pounds per year or “otherwise used” above 10,000 pounds per year by facilities subject to TURA. Past use is likely to be a reasonably good predictor of future use, suggesting that most of these substances are unlikely to be used in large quantities in the future. However, it is possible that some are being used below current TURA thresholds. Use under threshold is particularly important for substances that might be designated in the future as Higher Hazard Substances, as well as for substances whose use is expected to increase significantly in the future.

TURI relied primarily on the following resources in its effort to assess CERCLA chemical use under TURA thresholds.

- *New Jersey Hazardous Substance Fact Sheets*. TURI consulted the New Jersey Hazardous Substance Fact Sheets to obtain information on the sectors and applications in which a given substance is used.
- *Swedish Products Register*. To supplement this information, TURI also consulted the Swedish Products Register (KemI-stat), which provides information on substances reported by firms to the Swedish government.⁹ While uses reported in Sweden may not necessarily be relevant for Massachusetts industry, this resource provides an additional way to determine whether a substance is likely to be used in significant quantities in manufacturing, and to identify sectors in which it is likely to be used.
- *EPA Section 302A Extremely Hazardous Substances*. Approximately one quarter of the CERCLA-only substances that have never been reported under TURA are on EPA's Section 302A Extremely Hazardous Substances list. These substances are reportable to EPA for Threshold Planning Quantities between 100 and 10,000 pounds. Of these substances, EPA has received data on only four, indicating that the rest have not been used in significant quantities. (Of these four, two are in the reported group and are recommended for retention, and one is part of a category, so only one is reflected in the data presented below.)
- *EPA High Production Volume (HPV) Sponsored Chemical List*. Twenty-two of the CERCLA-only substances that have never been reported under TURA are on EPA's HPV list, indicating that they have been produced at over 1 million pounds per year.
- *Pesticide Action Network*. TURI consulted the Pesticide Action Network's Pesticide Information database to determine which of the pesticides on the list are banned or restricted in the US and other countries, and to identify their uses (e.g. fungicide, insecticide, antimicrobial, etc.).

- *Biotechnology*. Since biotechnology is an emerging industry in Massachusetts, there may be new and growing uses of some CERCLA substances in this sector. TURI staff consulted with an individual who works in the industry, an industry association, and a Local Emergency Planning Committee to identify substances with potentially emerging/increasing uses.
- *Program staff*. TURI also consulted with staff at the Office of Technical Assistance (OTA) regarding their experience with use of these substances under threshold in Massachusetts.
- *Chemical Economics Handbook*. Finally, TURI consulted the *Chemical Economics Handbook* to gather additional information on trends in the use of selected substances.¹⁰

5. Recommendations and use information

In this section, we present the SAB's and TURI's recommendations for each group, as well as use information gathered by TURI.

A. Acetates

There are 6 substances in the acetate group that have never been reported under TURA. (There are also four that have been reported; these have been addressed in a separate document.)

SAB recommendation. Based on hazard, the SAB has recommended retaining one of these substances, uranyl acetate, and taking no action on the other five. In developing its recommendation for the substances that have never been reported, the SAB also took into account decisions it had made about the acetate substances that have been reported under TURA. Uranyl acetate is of particular concern because it is a uranium compound.

Use information. Use information for the six substances is shown in Table A.

- All the substances in this group are used as solvents in a wide variety of applications.
- One important application is in the manufacture of cosmetics. Based on historical and existing use information, it is likely that these substances are currently used in Massachusetts below TURA reporting thresholds, and that they will continue to be used.

TURI recommendation. Based on the policy recommendations of the Advisory Committee, TURI supports the SAB's recommendation to retain uranyl acetate and take no action on the other five. The Advisory Committee has not had the opportunity to provide comments specifically on this group of substances, because the SAB's recommendation was finalized at a later meeting, after the Advisory Committee had met to discuss the CERCLA substances.

Table A: Acetates: Use information	
Chemical name	Use information (US)
<i>Recommended by the SAB for retention:</i>	
Uranyl acetate	Used as a laboratory reagent, in drying copy inks, and as an activator in bacterial oxidation process.
<i>Recommended by the SAB for no action:</i>	
sec-Butyl acetate	Widely used as a solvent for various purposes.
iso-Amyl acetate	Used as a solvent, in perfumes and in artificial fruit flavorings.
tert-Amyl acetate	Used as a solvent for lacquers and paints, in the extraction of penicillin and as nail polish.
sec-Amyl acetate	Widely used as a solvent for various purposes.
Ammonium acetate	Used as a chemical reagent, as a medication, and a meat preservative, and to make drugs, foam rubber, vinyl plastics and explosives. This chemical is a HPV.
	Source: New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008

B. Amines

There are 11 substances in the amine group that have never been reported under TURA.

SAB recommendation. Based on hazard, the SAB recommended retention of all substances in this group.

Use information. Use information for these substances is shown in Table B. These substances are used as intermediates in making dyestuffs, pharmaceuticals and other chemicals. In some cases these substances have direct medical applications.

TURI recommendation. Based on the policy recommendations of the Advisory Committee, TURI supports the SAB's recommendation to retain all substances in this group. Of the eleven substances, TURI believes that six could be used in significant quantities in the future by facilities subject to TURA, while the remaining five are either (a) unlikely to be used in significant quantities by facilities subject to TURA, or (b) are a lower priority for the program. Thus, should the Council wish to retain some substances in this group while taking no action on others, TURI would recommend retaining the six most likely to be used in significant quantities and to be a priority for the program. These substances are marked with a double asterisk (***) in the "comments" column of the table.

- The following substances are not currently used above TURA thresholds, but it is reasonable to expect that a manufacturing facility could begin using one or more of them above TURA thresholds in the future: p-Toluidine, n-Propylamine, Butylamine, tert-Butylamine, iso-Butylamine, and N,N-Diethylaniline.
- The following substances are lower priority for the program: Dipropylamine because it is unlikely to be used in Massachusetts manufacturing; 5-(Aminomethyl)-3-isoxazolol and Diphenylhydrazine because use is likely to be low volume; 1-Acetyl-2-thiourea because it is not manufactured or used industrially in the US; and methapyrilene, because as a medication it is unlikely to be a priority for the TURA program.

Table B: Amines: Use Information		
Chemical name	Use information (US)*	TURI comments
p-Toluidine	<i>New Jersey fact sheet:</i> Intermediates for dyestuffs and pharmaceuticals. <i>OTA staff:</i> Used below TURA reportable quantities for manufacturing dyestuffs.	Likely to be used. This substance is a HPV. **
n-Propylamine	<i>New Jersey fact sheet:</i> Intermediates in mfg. medicinal, agricultural, textile, rubber & plastic chemicals. <i>Chemical Economics Handbook:</i> "There are no high-volume applications" for this substance. <i>OTA staff:</i> Used below TURA reportable quantities for manufacture of rubber and plastic chemicals.	Likely to be used. **
Butylamine	<i>New Jersey fact sheet:</i> Used in making rubber, drugs, dyestuffs, insecticides and pharmaceuticals. <i>Chemical Economics Handbook:</i> "intermediates for rubber processing chemicals and pesticides."	Likely to be used. This substance is a HPV. **
Dipropylamine	<i>New Jersey fact sheet:</i> Chemical intermediate in the manufacture of herbicides. <i>Chemical Economics Handbook:</i> The dominant end use is production of dinitroaniline herbicides. Consumption of this substance has been declining.	As a chemical intermediate used in the manufacture of herbicides, this substance is unlikely to be used in Massachusetts manufacturing.
5-(Aminomethyl)-3-isoxazolol	<i>New Jersey fact sheet:</i> Used as medication and in medical studies.	Use likely to be low volume. Reportable to EPA if used above 500 lbs; has never been reported to EPA Region 1.
Diphenylhydrazine	<i>New Jersey fact sheet:</i> As reagent for arabinose & lactose 1,1-diphenylhydrazine hydrochloride.	Use likely to be low volume.

1-Acetyl-2-thiourea	<i>New Jersey fact sheet:</i> Not manufactured or used industrially in the US.	Unlikely to be used in MA.
tert-Butylamine	<i>New Jersey fact sheet:</i> Used in the preparation of insecticides, pharmaceuticals, oil additives and rubber accelerators.	Likely to be used in MA. This substance is a HPV. **
iso-Butylamine	<i>New Jersey fact sheet:</i> Used in the manufacture of insecticides and other chemicals, and in the processing of wool products.	Likely to be used in MA. **
N,N-Diethylaniline	<i>New Jersey fact sheet:</i> Used in organic synthesis and as a dyestuff intermediate.	Likely to be used in MA. This substance is a HPV. **
Methapyrilene	<i>New Jersey fact sheet:</i> Medication.	Low priority for TURA program.
	*Source: New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008; and Chemical Economics Handbook	** indicates substance is a priority for retention, based on expected use or other factors

C. Ammonium Compounds

There are 18 ammonium compounds that have never been reported under TURA. Primary uses of ammonium compounds are as preservatives, in chemical manufacturing, photographic applications, pharmaceuticals, and as buffer salts.

SAB recommendation. Based on hazard, SAB recommended retention of 5 of these compounds, and recommended no action on 13 compounds.

- Table C1 shows use information for the 5 substances recommended for retention by the SAB.
- Table C2 shows use information for the 14 substances recommended for no action by the SAB.

TURI recommendation.

- Based on the policy recommendations of the Advisory Committee, TURI supports the SAB's recommendation for retention of five substances in this group. TURI believes these substances are unlikely to be used by TURA covered facilities above TURA thresholds.
- TURI supports the SAB's recommendation to take no action on the 13 substances listed in Table C2. Of those the SAB recommended for no action, three substances in this group have been identified as potentially used in smaller quantities, for example in biotech applications.

Table C1: Ammonium Compounds recommended for retention by SAB		
Chemical name	Use information*	TURI comments
Ammonium carbamate	<i>NJ fact sheet:</i> Used as a fertilizer and an ammoniating agent. <i>KemI:</i> Reported at 0.6 tonnes; used in 6 products; data supplied by fewer than 3 companies.	Use likely to be low volume
Ammonium sulfide	<i>NJ fact sheet:</i> Manufacture of surfactants, photocopy paper. <i>KemI:</i> Not found in database.	Use likely to be low volume
Ammonium picrate	<i>NJ fact sheet:</i> Used in explosives, fireworks and as a rocket propellant. <i>KemI:</i> Not found in database.	No manufacturers of fireworks, explosives, or rocket propellants in MA. Use likely to be low volume.
Ammonium benzoate	<i>NJ fact sheet:</i> Used as a preservative and in medicines. <i>KemI:</i> Reported at 0.2 tonnes; used in 12 products; data supplied by fewer than 3 companies.	Use likely to be low volume
Ammonium carbonate	<i>NJ fact sheet:</i> Used to make Ammonia salts, fire extinguishing agents and baking powders. <i>KemI:</i> Reported at 212 tonnes; used in 14 product; data supplied by fewer than 3 companies.	Also used in small biotech applications. Use likely to be low volume.
*Sources: New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008; Swedish Chemicals Inspectorate (KemI) KemI-stat database.		

Table C2: Ammonium Compounds recommended for no action by SAB

Chemical name	Use information*
Ammonium bisulfite	Used as a preservative, as a hair waving and bleaching agent, and to make other chemicals.
Ammonium sulfite	Used in medicines, photography, hair wave solutions, and to make other chemicals.
Ferric ammonium citrate	Used in photography, for blueprints, and as a medication.
Ammonium fluoborate	Used in the metal industry, as a catalyst and in flame retardants.
Ammonium oxalate (14258-49-2)	<i>Chemical Economics Handbook</i> : US applications include “metal treatment, precious metal recovery, and flare burn control agent in safety explosives.” Formerly used in photographic printing processes, has been replaced by newer technologies.
Ammonium tartrate (14307-43-8)	Topical Ophthalmic; Textile Industry; Medicine
Ferric ammonium oxalate	In photography; blueprints; in coloring of Al and Al alloys. <i>Chemical Economics Handbook</i> : “Imparts a gold color to anodized aluminum.”
Ammonium citrate, dibasic	Used in pharmaceuticals and rustproofing compounds, and in chemical analysis
Ammonium tartrate (3164-29-2)	Used in the textile industry and in medicine.
Ferric ammonium oxalate	No information available at present.
Ammonium oxalate (5972-73-6)	No information available at present.
Ammonium oxalate (6009-70-7)	Mfg explosives; leather finishes; electrolyte detinning of Iron; Dyeing; Mfg blueprint paper; metal polishes; detection of Ca, Pb, and Rare Earths
Ferrous ammonium sulfate	Used in photography, analytical chemistry and Iron-plating baths.
*Source, unless otherwise noted: New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008	

D. Benzene-related compounds

There are 16 benzene related compounds that have never been reported under TURA. Uses of benzene-related compounds include use in dyes, as solvents, chemical manufacturing, medicinal applications, photography, and explosives. Use information is shown in Table D.

SAB recommendation. Based on hazard, the SAB recommended retention of all substances in this group.

TURI recommendation. Based on the policy recommendations of the Advisory Committee, TURI supports the SAB’s recommendation to retain all substances in this group. Of the sixteen substances, TURI believes that nine could be used in significant quantities in the future by facilities subject to TURA, while the remaining seven are either (a) unlikely to be used in significant quantities by facilities subject to TURA, or (b) are a lower priority for the program. Thus, should the Council wish to retain some substances in this group while taking no action on others, TURI would recommend retaining the nine most likely to be used in significant quantities and to be a priority for the program. These substances are marked with a double asterisk (**) in the “comments” column of the table.

- The following substances are higher priority, based on expected uses: 4-Bromophenyl phenyl ether; nitrotoluene; dinitrobenzene (mixed isomers); Calcium dodecylbenzenesulfonate; Triethanolamine dodecylbenzene sulfonate; Isopropanolamine dodecylbenzene sulfonate; Diaminotoluene (CAS #496-72-0); 3,4-Dinitrotoluene; and Benzonitrile.
- The following substances are lower priority, based on expected uses or other factors: alpha,alpha-dimethyl-Benzeneethanamine; Epinephrine; Diaminotoluene (CAS # 823-40-5); 1,2,4,5-Tetrachlorobenzene; Benzenesulfonyl chloride; Benzoic Acid (Physostigminesalicylate) and 1,3,5-Trinitrobenzene.

Table D: Benzene related compounds recommended by the SAB for retention: Use information

Chemical name	*Use information	TURI comments
4-Bromophenyl phenyl ether	<i>NJ fact sheet:</i> Research chemical and fire retardant. <i>KemI:</i> Not found in database.	Research chemical likely to be used at low volume only. Flame retardant application may be an emerging use, suggesting possible future increase in volume. **
Benzeneethanamine, alpha,alpha-dimethyl-	<i>NJ fact sheet:</i> Anorectic/Anorexigenic drug used to treat obesity. <i>KemI:</i> Not found in database.	Low priority for TURA program.
Nitrotoluene	<i>NJ fact sheet:</i> Used in the manufacture of dyes, rubber, agricultural chemicals, explosives and other chemicals. <i>KemI:</i> Not found in database. <i>Chemical Economics Handbook:</i> "The nitration of toluene produces a mixture of o-, m-, and p-nitrotoluene. These products and their derivatives are used in the manufacture of agricultural chemicals, p-aminobenzoic acid (a sunscreen), optical brighteners, rubber chemicals and toluidine (dye intermediates). Only one producer in the US.	Basic feedstock chemical; likely to be used; increased volume in future is possible. **
Dinitrobenzene (mixed isomers)	<i>NJ fact sheet:</i> Used in making dyes, other chemicals & explosives. <i>KemI:</i> Database indicates 0 tonnes, 0 products. <i>OTA staff:</i> Used below TURA reportable quantities for dyes and chemicals manufacturing.	Future increase in use is possible. **
Calcium dodecylbenzenesulfonate	<i>NJ fact sheet:</i> Salt of surfactant. <i>KemI:</i> Reported at 132.2 tonnes; used in 39 products. Main sectors reporting this substance: Export; Agriculture.	Future increase in use is possible. **
Triethanolamine dodecylbenzene sulfonate	<i>NJ fact sheet:</i> Household detergent products. <i>KemI:</i> Reported at 10 tonnes; used in 35 products. Main sector reporting this substance: Export.	Future increase in use is possible. This chemical is a HPV. **
Isopropanolamine dodecylbenzene sulfonate	<i>NJ fact sheet:</i> As a surface active ingredient in soaps and detergents. <i>KemI:</i> Data supplied by fewer than 3 companies.	Future increase in use is possible. **
Diaminotoluene (CAS # 496-72-0)	<i>NJ fact sheet:</i> Dyes & preparation of toluene diisocyanates. <i>KemI:</i> Not found in database.	Future increase in use is possible. This chemical is a HPV. **
Epinephrine	<i>NJ fact sheet and OHM/TADS:</i> Used as a drug in medical and Veterinary applications. <i>KemI:</i> Not found in database. <i>OTA staff:</i> Used below TURA reportable quantities for veterinary application at New England aquarium.	Low priority for TURA program.
3,4-Dinitrotoluene	<i>NJ fact sheet:</i> Explosives, propellants, in the manufacture of toluene diisocyanates, dye intermediates. <i>KemI:</i> Data supplied by fewer than 3 companies.	Future increase in use is possible. **
Diaminotoluene (CAS # 823-40-5)	No use information is listed in ExPub for this CAS number; however, the following information is available for the same chemical name with another CAS number: Dyes & preparation of toluene diisocyanates. This substance was formerly listed as a High Production Volume (HPV) chemical. However, in 2002 the manufacturer, Lyondell, requested that EPA change the designation to "no longer HPV," because the firm now reports a generic mixture of several isomers, rather than individual isomers. <i>KemI:</i> Database shows 0 tonnes, 0 products.	Because this substance is used as an intermediate in chemical manufacturing, it is unlikely to be used by Massachusetts manufacturers.
1,2,4,5-Tetrachlorobenzene	<i>NJ fact sheet:</i> Used in production of herbicides, defoliants & insecticides. <i>KemI:</i> Database shows 0 tonnes, 0 products.	Because this substance is used as an intermediate in manufacture of pesticides, it is unlikely to be used by Massachusetts manufacturers.

Benzenesulfonyl chloride	<i>NJ fact sheet:</i> Used as an intermediate and as a reagent in making other chemicals. <i>KemI:</i> Not found in database.	Because this substance is an intermediate in chemical manufacturing, it is unlikely to be used in significant quantities by Massachusetts manufacturers.
1,3,5-Trinitrobenzene	<i>NJ fact sheet:</i> Used as an explosive; as an acid-base indicator, and in the production of rubber. <i>KemI:</i> Database shows 0 tonnes, 0 products.	Because the primary use of this substance is as an explosive, it is unlikely to be used in significant quantities by Massachusetts manufacturers.
Physostigmine salicylate (Benzoic Acid derivative)	Used as a glaucoma medication.	Low priority for TURA program.
Benzonitrile	<i>NJ fact sheet:</i> Used as a solvent for nitrile rubber, specialty lacquers, resins, polymers & metal salts. <i>KemI:</i> Not found in database.	Future increase in use is possible. **
	*Sources: New Jersey Hazardous Substance Fact Sheets and Oil and Hazardous Materials Technical Assistance Data System, accessed via ExPub, January-April 2008; Swedish Chemicals Inspectorate (KemI) KemI-stat database; Chemical Economics Handbook.	** indicates substance is a priority for retention, based on expected use or other factors

E. Pesticides

Of the 86 substances in the pesticide group, over half have been banned or restricted either in the US or other countries. Because agricultural and ancillary facility uses are not covered under TURA, pesticides have historically been used in few TURA-covered uses in Massachusetts. Significant existing or emerging covered uses include intermediates in organic synthesis; treatments in medicinal applications; and additives to antimicrobial products (including wood preservatives, antifoulants in coatings, and antibacterials in plastics).

SAB recommendation.

- The SAB recommended retaining all the pesticides that are banned or restricted in the US and/or in other countries (see Table E1).
- In addition, the SAB recommended retaining the majority of the other substances in this group (see Table E2).
- The SAB recommended no action on six pesticides (see Table E3). Based on the data reviewed by the SAB, these pesticides posed fewer health and environmental concerns than the others.

TURI recommendation. Based on the policy recommendations of the Advisory Committee, TURI supports the SAB's recommendations for all substances in this group. TURI has not identified any emerging uses of the pesticides on this list. However, Advisory Committee members pointed out that in some instances, substances listed as pesticides may be used in manufacturing. In addition, Advisory Committee members noted that some of the substances listed in the pesticides group are targeted for international phaseout under the Stockholm Convention on Persistent Organic Pollutants, and that removing them from the TURA list could be seen as inconsistent with national and international efforts to address any remaining uses of these substances.

Table E1: Pesticides that are banned or restricted in the US and/or other countries: recommended for retention by SAB

Chemical Name	Ban/Restriction information	EPA Registered for Use in US?	Chemical class; Use Type; TURI comments
Endosulfan	Global ban being considered under Stockholm Convention. Registered in US but banned/restricted/cancelled in 8 countries.	Yes	Organochlorine; Insecticide; **

Endosulfan sulfate	Parent chemical (Endosulfan) is registered in US but banned/restricted/cancelled in 8 countries.	No	Organochlorine; Breakdown product
beta – Endosulfan	Parent chemical (Endosulfan) is registered in US but banned/restricted/cancelled in 8 countries.	No	Organochlorine; Insecticide
Endrin aldehyde	Parent chemical (Endrin) is banned/restricted/cancelled in 27 countries; not legal for import in 1 country; not banned/restricted/cancelled in US	No	Organochlorine; Breakdown product
alpha – Endosulfan	Parent chemical (Endosulfan) is registered in US but banned/restricted/cancelled in 8 countries.	No	Organochlorine; Insecticide
Carbamic acid, 1H-benzimidazol-2-yl,methyl ester	This chemical is registered in the US, but its parent chemical is not. Parent chemical and this chemical are restricted in Sweden.	Yes	Benzimidazole; Fungicide, breakdown product; This chemical is a HPV; **
2,4-D Esters (1928-38-7)	Parent chemical (2,4-D) is registered in US but banned/restricted/cancelled in 5 countries.	No	Chlorophenoxy acid or ester; Herbicide
2,4,5-T esters (1928-47-8)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US.	No	Chlorophenoxy acid or ester; Herbicide
2,4-D Esters (1928-61-6)	Parent chemical (2,4-D) is registered in US but banned/restricted/cancelled in 5 countries.	No	Chlorophenoxy acid or ester; Herbicide
2,4,5-T esters (25168-15-4)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US .	No	Chlorophenoxy acid or ester; Herbicide
2,4-D Esters (25168-26-7)	Located on the Banned or Severely Restricted Pesticides List (US-EPA); Parent chemical (2,4-D) is registered in US but banned/restricted/cancelled in 5 countries.	Yes	Chlorophenoxy acid or ester; Herbicide; **
2,4,5-T esters (2545-59-7)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	No	Chlorophenoxy acid or ester; Glycol Ether
Chlorpyrifos	US EPA has banned for use in homes and gardens.	Yes	Organophosphate; Insecticide, Nematicide; **
2,4,5-TP esters (32534-95-5)	Parent chemical (Silvex) is registered in US but banned/restricted/cancelled in 6 countries.	No	Chlorophenoxy acid or ester; Herbicide
2,4-D Esters (53467-11-1)	Parent chemical (2,4-D) is registered in US but banned/restricted/cancelled in 5 countries.	No	Chlorophenoxy acid or ester; Herbicide
Ethion	Restricted by US EPA (http://www.epa.gov/oppsrrd1/reregistration/REDS/factsheets/ethionfactsheet.pdf)	Registration cancelled.	Organophosphate; Insecticide
2,4,5-T esters (93-79-8)	Banned/not legal for import in Argentina, not banned in US, legal for import in US; Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	No	Chlorophenoxy acid or ester; Herbicide
2,4-D Esters (94-79-1)	Parent chemical (2,4-D) is registered in US but banned/restricted/cancelled in 5 countries. On CA Air Contaminants OSHA Act list.	Not listed in PAN database	Chlorophenoxy acid or ester
2,4,5-T amines (2008-46-0)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	No	Chlorophenoxy acid or ester; Herbicide
2, 4, 5-T amines (6369-97-7)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	No	Chlorophenoxy acid or ester; Herbicide
2, 4, 5 – T salts* (13560-99-1)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	No	Chlorophenoxy acid or ester; Herbicide
2, 4, 5-T amines (3813-14-7)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not	Not listed in PAN database	

	banned/restricted/cancelled in US		
2, 4, 5 -T esters (61792-07-2)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	Not listed in PAN database	
2,4,5-T amines (6369-96-6)	Parent chemical (2,4,5-T) is banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	Not listed in PAN database	
2,4,5-T acid (93-76-5)	Banned/restricted/cancelled in 33 countries; not legal for import in 69 countries; not banned/restricted/cancelled in US	No	Chlorophenoxy acid or ester; Herbicide
2,4-D salts and esters (94-75-7)	Registered in US but banned/restricted/cancelled in 5 countries.	Yes	Chlorophenoxy acid or ester; Herbicide, Plant Growth Regulator; **
Silvex (2,4,5-TP) (93-72-1)	Registration cancelled in US; banned/restricted/cancelled in 6 countries; listed as 'Banned' on the U.S. PIC-Nominated Pesticides List	No	Chlorophenoxy acid or ester; Herbicide, Plant Growth Regulator
Dintrophenol	This chemical and its parent chemical are not registered in the US; Parent chemical is cancelled in Sweden.	No	Dinitrophenol derivative; Breakdown product, Impurity
4,6-Dinitro-o-cresol and salts	Not registered for use in the US but banned in 10 countries	No	Dinitrophenol derivative; Fungicide, Impurity, Herbicide, Microbicide
Dichlobenil	Registered for use in the US; banned in 2 countries	Yes	Substituted Benzene; Herbicide; **
Carbamic acid, [(dibutylamino)thio]methyl-,2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester(carbosulfan)	Not registered for use in the US; severely restricted in Belize	No	N-Methyl Carbamate; Insecticide
Tetraethyl pyrophosphate aka Tepp	Not registered for use in the US; banned in 5 countries	No	Organophosphorous; Insecticide
O,O-Diethyl O-pyrazinyl phosphorothioate	Not registered for use in the US; banned in Belize	No	Organophosphorous; Insecticide
Phorate, a.k.a Thimet	Registered for use in the US; banned/restricted in 3 countries	Yes	Organophosphorous; Insecticide, Nematicide; **
Disulfoton	Registered for use in the US; banned/severely restricted in 4 countries	Yes	Organophosphorous; Insecticide, Nematicide; **
Diethyl-p-nitrophenyl phosphate aka Paraoxon	Parent chemical (Parathion) is banned/restricted/cancelled in 23 countries; not legal for import in 50 countries; this chemical is not banned/restricted/cancelled/registered in US	No	Organophosphorous; Breakdown Product
Tetraethylthiopyrophosphate aka Sulfotep	Not registered for use in the US; banned in 3 countries	No	Organophosphorous; Insecticide
Coumaphos	Registered for use in the US; not banned or restricted elsewhere; Some formulations classified by EPA as RUPs (Restricted Use Pesticides) from http://extoxnet.orst.edu/pips/coumapho.htm	Yes	Organophosphorous; Insecticide; **
Azinphos-methyl aka Guthion	Registered for use in the US but banned in 3 countries	Yes	Organophosphorous; Insecticide; **
Diphosphoramidate, octamethyl- aka Schradan	Not registered for use in the US; banned in 4 countries	No	Phosphorodiamide; Insecticide

Propanal, 2-methyl-2-(methylsulfonyl)-, [(methylamino)carbonyl] oxime	Parent chemical (Aldicarb) is registered for use in the US but banned/restricted/cancelled in 13 countries.	No	N-Methyl Carbamate; Breakdown product
Ethanimidothioic acid, N-[[methylamino)carbonyl] aka Methomyl	Registered for use in the US but banned in 2 countries; Parent chemical (Thiodicarb) registered for use in the US but restricted in Belize	Yes	N-Methyl Carbamate; Insecticide; Breakdown product; **
Ammonium silicofluoride	Parent chemical (Sodium fluosilicate) is cancelled in the UK.	No	Inorganic, insecticide
Diquat (2764-72-9)	Parent chemical (Diquat dibromide) is registered for use in the US but banned/restricted in 3 countries; this chemical is not banned/restricted/cancelled/registered in US	No	Bipyridylum
delta-Hexachlorocyclohexane	Parent chemical (Lindane) is registered for use in the US but banned/restricted/cancelled in 39 countries; not legal for import in 65 countries; this chemical is banned/restricted/cancelled in 34 countries; not legal for import in 98 countries	No	Organochlorine; Insecticide
Fluoroacetamide	Parent chemical (1080) is registered for use in the US but banned 5 countries; this chemical is banned/restricted/cancelled in 27 countries; not legal for import in 101 countries	No	Unclassified; Rodenticide, Insecticide
2,2-Dichloropropionic acid aka Dalapon	Not registered for use in the US but banned in 2 countries	No	Unclassified; Herbicide
Dichloropropane - Dichloropropene (mixture)	This chemical not registered for use in US but banned in Libya; Parent chemical (1,3-dichloropropene) is registered for use in the US but banned/cancelled in 5 countries	No	Halogenated organic; Fumigant, Nematicide
Diquat dibromide	Registered for use in the US but banned/restricted in 3 countries	Yes	Bipyridylum; Herbicide, Desiccant; **
*Sources: Pesticide Action Network (PAN) Database; Chemical Economics Handbook; and US-EPA Banned and Severely Restricted Pesticides List			** indicates substance is a priority for retention, based on expected use or other factors

Table E2: Pesticides recommended by the SAB for retention: not banned or restricted			
Chemical name	Use information	EPA registered for use in the US?	TURI comments
2,4,5-T amines (1319-72-8)	Parent chemical is a herbicide.	No data found	
Endothall	Used to control weeds, as a defoliant, and a desiccant	Yes	**
4-Aminopyridine	Used to control crows, pigeons & other birds; also used as a chemical intermediate and as a medicine	Yes	**
Hexachloropropene	Used as a solvent, plasticizer, and hydraulic fluid	No data found	
1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-,O-[(methylamino)carbonyl]oxime	Nematicide. Reportable to EPA if used above 500 lbs/year. Has never been reported to EPA Region 1.	No	
Diisopropylfluorophosphate	Ophthalmic cholinergic; miotic in veterinary practice; In treatment of human glaucoma; insecticide; studied as potential warfare agent (nerve gas)	No	
Bis(dimethylthiocarbamoyl) sulfide (tetramethylthiurammonosulfide)	Vulcanisation accelerator; booster for thiazoles especially in nitrile rubbers		This chemical is a HPV. **
DDET	Pesticide, Herbicide	No data found	
Phenylthiourea	Used in medical genetics, as a repellent for rats, rabbits and weasels, and in the production of rodenticides.	No data found	
beta-BHC*	Used as an insecticide.	No (Parent chemical)	

		banned/restricted)	
<i>Carbamates:</i>			
Carbamic, (3-chlorophenyl)-,4-chloro-2-butynyl ester	Former use selective post-emergence herbicide	No	
Carbamic acid, methyl- 3-methylphenyl ester	Used as an insecticide to control citrus mealybugs and cotton aphids	No	
Carbamic acid,dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester	Systemic aphicide, insecticide	No	
Carbamothioic acid, dipropyl-, S-propyl ester	Selective soil incorporated herbicide	No	
Carbamothioic acid, bis(2-methylpropyl)-, S-ethyl ester	Selective herbicide	Yes	
Ethanimidothioic acid, 2-(dimethylamino)-N-[[[(methylamino)carbonyl]oxy]-2-oxo-, methyl ester	Carbamate pesticide	Yes	
Methanimidamide, N,N-dimethyl-N-[3-[[[(methylamino)carbonyl]oxy]phenyl]-,monohydrochloride	Insecticide-Acaricide; effective against mites and bugs and used on fruit and alfalfa	Yes	
Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester	Agricultural Chemical	No	
Carbamic acid, dimethyl-,1-[(dimethylamino)carbonyl]-5-methyl-1H-pyrazol-3-y-1 ester	Specific stomach insecticide for the control of fruit flies and other flies including strains which have developed resistance to chlorinated hydrocarbons and certain organophosphorous compounds	No	
<i>Amines:</i>			
Methanamine	Used in making other chemicals and as a food additive		This chemical is a HPV. **
<i>Botanicals (Pyrethrins):</i>			
Pyrethrins (121-21-1)	Insecticide (stock & pet sprays, household sprays)	No	
Pyrethrins (121-29-9)	Insecticide (stock & pet sprays, household sprays)	No	
Pyrethrins (mixture) (8003-34-7)	Insecticide	Yes	**
<i>Phenols:</i>			
2-Cyclohexyl-4,6-dinitrophenol	Used as an insecticide	No	
Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate	Insecticide	No	
Phenol, 3-(1-methylethyl)-, methyl carbamate (m-Cumenyl methylcarbamate)	Insecticide	No	
<i>Phosphates:</i>			
O,O-Diethyl S-methyl dithiophosphate	Possesses insecticidal, acaricidal, and fungicidal activity; also as intermediate for organic synthesis	No data found	
Hexaethyl tetraphosphate	Acaricide, insecticide for soft bodied insects; mites	No	
<i>Naphthalenes:</i>			
Dichlone	Used as a seed disinfectant, fungicide & insecticide	No	
1,4-Naphthoquinone	Used in the production of rubber, polyester resins, dyes, pharmaceuticals & pesticides	No data found	
<i>Benzene related compounds:</i>			
Pentachlorobenzene	Synthesis of pentachlorobenzene; fungicide; flame retardant	No data found	
*Sources: New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008; Swedish Chemicals Inspectorate KemiStat database; Chemical Economics Handbook; Pesticide Action Network database; National Pesticide Information Retrieval System (http://ppis.ceris.purdue.edu/htbin/epachem.com).			

Chemical name	Use*
Ethanimidothioci acid, 2-(dimethylamino-n-hydroxy-2-oxo-, methyl ester (A2213)	Agricultural Chemical
Carbamodithioic acid, (hydroxymethyl)methyl-,monopotassium salt (potassium n-hydroxymethyl-n-methylidithiocarbamate)	Agricultural Chemical
<i>Carbamates:</i>	
Thiofanox	Insecticide
<i>Amines:</i>	
sec-Butylamine	Fungistat
sec-Butylamine	Agricultural Chemical
<i>Phenols:</i>	
Methanimidamide, N,N-dimethyl-N-[2-methyl-4-[[[(methylaino)carbonyl]oxy]phenol]-	Carbamate pesticide
*Sources: <i>NJ</i> : New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008; <i>KemI</i> : Swedish Chemicals Inspectorate KemiStat database; Chemical Economics Handbook; and PAN Database	

F. Phenols

There are seven substances in the phenols group. These substances are primarily used in chemical manufacturing and the manufacture of dyes, pesticides and pharmaceuticals. Table F shows use information for these substances.

SAB recommendation. Based on hazard, The SAB recommended retention of all chemicals in this group.

TURI recommendation. Based on the policy recommendations of the Advisory Committee, TURI supports the SAB's recommendations for all substances in this group. Of the seven substances, TURI believes that five may reasonably be expected to be used in significant quantities in Massachusetts manufacturing. These substances are marked with a double asterisk (**) in the "comments" column of the table.

Chemical name	*Use information	TURI comments
Xylenol	<i>NJ fact sheet:</i> Used in the manufacture of pesticides, pharmaceuticals, plasticizers, and rubber chemicals, and as an additive to lubricants and fuels. <i>KemI:</i> reported at 99.8 tonnes; used in 7 products; data supplied by fewer than 3 companies. <i>Chemical Economics Handbook:</i> 2,6-xylenol used in production of polymers (e.g. GE Noryl); PPE resins; some used in producing TXP (base stock for fire-resistant functional fluids). <i>OTA staff:</i> Used below TURA reportable quantities for manufacturing plasticizers and rubber chemicals.	This chemical is a HPV. **
7-Benzofuranol,2,3-dihydro-2,2-dimethyl-	<i>NJ fact sheet:</i> Used to manufacture carbofuran. <i>KemI:</i> Not found in database.	As a chemical intermediate used in manufacture of the pesticide carbofuran, this substance is unlikely to be used in Massachusetts.
1,3-Benzodioxol-4-ol,2,2-dimethyl-	<i>NJ fact sheet:</i> Used to manufacture bendiocarb. <i>KemI:</i> Not found in database.	As a chemical intermediate used in manufacture of the pesticide bendiocarb, this substance is unlikely to be used in Massachusetts. This chemical is a HPV.
Nitrophenol (mixed isomers)	<i>NJ fact sheet:</i> Used as a chemical indicator and intermediate. <i>KemI:</i> Not found in database.	**
2,5-Dinitrophenol	<i>NJ fact sheet:</i> Mfg of dyes and organic chemicals and as a pH indicator. Preservation of timber and manufacture of photographic developer. <i>KemI:</i> Not found in database.	**
m-Nitrophenol	<i>NJ fact sheet:</i> Used to make dyestuffs, pesticides, other chemicals & indicator solutions. <i>KemI:</i> Not found in database.	**

2,6-Dinitrophenol	<i>NJ fact sheet:</i> Dyes, especially sulfur colors, picric acid, picramic acid, preservation of lumber, mfg of photographic developer diaminophenol hydrochloride and explosives. <i>KemI:</i> Not found in database.	**
	*Sources: <i>NJ:</i> New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008; <i>KemI:</i> Swedish Chemicals Inspectorate KemiStat database; and Chemical Economics Handbook	** indicates substance is a priority for retention, based on expected use or other factors

G. Non-categorized

The chemicals in this miscellaneous group have a wide variety of uses including chemical manufacturing, intermediates, catalysts, plastics and pharmaceutical production.

SAB recommendation.

- Based on hazard, The SAB recommended retaining 20 substances.
 - Of the substances the SAB recommended for retention, eleven were identified as substances that could potentially be designated as Higher Hazard substances in the future. These are listed in Table G1.
 - Substances the SAB recommended for retention but did not identify as candidates for Higher Hazard status are listed in Table G2.
- The SAB recommended no action on 11 substances. These are listed in Table G3.

TURI recommendation. Based on policy recommendations from the Advisory Committee, TURI supports all of the SAB's recommendations on these substances. Within this group, some substances are higher priority from TURI's perspective, based on expected use patterns. These substances are marked with a double asterisk (**) in the "comments" column of the table.

Of the substances recommended for no action by the SAB, OTA staff provided use information on one: sodium bifluoride is used below TURA reportable quantities for leather bleaching.

Chemical name	Use information	TURI comments and recommendation
Phosphorous trichloride	<i>NJ fact sheet:</i> Used in gasoline additives and textile finishing, and to make other chemicals, pesticides, dyestuffs, catalysts and plasticizers. <i>KemI:</i> 626 tonnes reported; used in 3 products.	Reportable to EPA if used above 500 lbs/year. Has never been reported to EPA Region 1.
Methyl ethyl ketone peroxide	<i>NJ fact sheet:</i> Used in making resins and polymers and is usually blended with another chemical to reduce its sensitivity to shock. <i>KemI:</i> 821.9 tonnes reported; used in 88 products. Main sector reporting use: Plastics in primary forms. <i>Chemical Economics Handbook:</i> Initiator for unsaturated polyester resin.	This chemical is a HPV. **
1,3-Dichloropropane	No information available in NJ fact sheets or in KemI database. <i>Chemical Economics Handbook:</i> Mixture of dichloropropane and dichloropropene was used as a halogenated fumigant; phased out in 1980s.	**
Dichloropropane	<i>NJ fact sheet:</i> Solvents, intermediates and soil fumigants. <i>KemI:</i> Data supplied by fewer than three companies.	**
Dichloropropene	<i>NJ fact sheet:</i> Primary use is as a soil fumigant used in planting crops. <i>KemI:</i> Data supplied by fewer than three companies. <i>Chemical Economics Handbook:</i> 1-3-dichloropropene used as fumigant, primarily in California and Southeast US (peanuts, cotton, potatoes). Indicates that use is increasing in the US.	Principal use is agricultural; therefore, unlikely to be used by firms subject to TURA.
Carbonic difluoride	<i>NJ fact sheet:</i> Used as a chemical intermediate in organic synthesis. Also used as a military poison gas. <i>KemI:</i> Not found in database.	**
Acetyl bromide	<i>NJ fact sheet:</i> Used in making dyes and organic chemicals. <i>KemI:</i>	**

	Database reports 0 tonnes, 0 products. <i>Chemical Economics Handbook</i> : No information available.	
Methanesulfonyl chloride, trichloro-	<i>NJ fact sheet</i> : Used as a fungicide, as a dye intermediate and to make other chemicals. <i>KemI</i> : Not found in database.	Reportable to EPA if used above 500 lbs/year. Has never been reported to EPA Region 1.
Bromoacetone	<i>NJ fact sheet</i> : Used as a chemical war gas and in organic synthesis. <i>KemI</i> : Not found in database.	**
Acetyl chloride	<i>NJ fact sheet</i> : Used to make pharmaceuticals and pesticides. <i>KemI</i> : Data supplied by fewer than 3 companies. <i>Chemical Economics Handbook</i> : No information available.	**
2-Chloronaphthalene	<i>NJ fact sheet</i> : No commercial uses. <i>KemI</i> : Not found in database.	

Table G2: Non-Categorized substances recommended for retention by SAB (not identified as potential Higher Hazard substances)

Chemical name	*Use information	TURI comments
Nitrogen dioxide (N2O4)	Not found in NJ fact sheets.	**
2-Chloroethyl vinyl ether	Used in the manufacturing of cellulose esters, anesthetics, and sedatives.	**
Sulfur monochloride	Chemicals production; fungicides; insecticides; rubber synthesis; dyes	**
1,1-Dichloropropane	May be present with 1,2-Dichloropropane in soil fumigant blends. OHMTADS	
Chloroacetaldehyde	Used to make certain chemicals and as a fungicide to control algae and bacteria in water.	**
Pyrrolo[2,3-b] indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-,	Drugs (mitotics); Natural Products; Ophthalmic solutions	Medical use; low priority for TURA program.
Ethyl methacrylate	Used to make chemicals, plastics & resins. <i>Chemical Economics Handbook</i> : Ethyl methacrylate is specialty methacrylate, produced by Lucite International; used in lacquer coatings.	This chemical is a HPV. Used in plastics industry. **
Naphthenic acid	Used in the production of metallic naphthanates for paint driers and cellulose preservatives. Also used as a solvent, detergent and rubber reclaiming agent. <i>KemI</i> : 98 tonnes reported; used in 10 products.	HPV **
Thioperoxydicarbonic diamid, tetrabutyl	Not found in NJ Hazardous Substance Fact Sheets	HPV **

Sources: New Jersey Hazardous Substance Fact Sheets and Oil and Hazardous Materials Technical Assistance Data System, accessed via ExPub, January-April 2008; and *Chemical Economics Handbook*

Table G3: Non-Categorized substances recommended for no action by SAB

Chemical name	*Use information
Piperidine, 1,1-(tetrathiodicarbonothioyl)-bis-(Bis(pentamethylene) thiuram tetrasulfide)	<i>KemI</i> : 2,9 tonnes reported; used in 8 products; data supplied by fewer than 3 companies.
Sulfur phosphide	<i>NJ fact sheet</i> : Used in the production of safety matches, lube oil additives, and pesticides.
Sodium bifluoride	<i>NJ fact sheet</i> : Used as an antiseptic, a preservative, and a stone cleaner, and in etching glass, leather bleaching, and laundry procedures, and tin plate production. <i>KemI</i> : 8,5 tonnes reported in 8 products; data supplied by fewer than 3 companies.
Zirconium potassium fluoride	<i>NJ fact sheet</i> : Used in manufacturing metallic zirconium and as a catalyst. <i>KemI</i> : Data supplied by fewer than 3 companies.
Acenaphthylene	No use information available in NJ fact sheets or <i>KemI</i> database.
1,3-Pentadiene	<i>NJ fact sheet</i> : Used in the production of polymers
Ferric fluoride	<i>NJ fact sheet</i> : Used as a catalyst, fluorinating agent and medication.
Ferric nitrate	<i>NJ fact sheet</i> : Used in textile dyeing and tanning, as a corrosion inhibitor, and as a medication.

Carbamodithioic acid dibutyl sodium salt	No use information available in NJ fact sheets or KemI database.
iso-Butyric acid	<i>NJ fact sheet:</i> Used in the production of solvents, flavors, perfumes, varnishes and disinfectants, and in tanning hides.
Zirconium tetrachloride	<i>NJ fact sheet:</i> Used as a Friedel-Crafts catalyst, and as a medication.

H. IARC 1, 2, & 3

SAB recommendation. Based on hazard, The SAB recommended retaining all substances listed under IARC in groups 1 (known carcinogen), 2 (probable or possible carcinogen), and 3 (not classifiable as to carcinogenicity). Substances in these groups represent a wide variety of chemical types and uses.

TURI recommendation. Based the policy recommendations of the Advisory Committee, TURI supports the SAB's recommendations on all these substances. Regardless of expected use, TURI considers substances in IARC groups 1 and 2 to be a high priority for retention. Within group 3, TURI considers some substances to be higher priority than others. These substances are marked with a double asterisk (**) in the "comments" column of the table.

Table H: IARC 1, 2, & 3			
Chemical name	IARC group	*Use information	TURI comments
Melphalan	1	<i>NJ fact sheet:</i> Used as an anti-cancer drug and an insecticide. <i>KemI:</i> Not found in database.	**
Chlorambucil	1	<i>NJ fact sheet:</i> Drug used in the treatment of cancer. <i>KemI:</i> Not found in database.	**
Chlornaphazine	1	Antineoplastic drug (OHM/TADS, expub.com). <i>KemI:</i> Not found in database.	**
Cyclophosphamide	1	<i>NJ fact sheet:</i> Synthetic antineoplastic drug. <i>KemI:</i> Not found in database.	**
Diethylstilbestrol	1	<i>NJ fact sheet:</i> Used as medication. <i>KemI:</i> Not found in database.	**
Cacodylic acid	1	<i>NJ fact sheet:</i> Used as an herbicide; soil sterilant; in chemical warfare; and in timber thinning.	**
4-Chloro-o-toluidine, hydrochloride	2A	<i>NJ fact sheet:</i> Used to make dyes for cotton, silk, acetate, and nylon	**
Hydrazine, 1,2-dimethyl-	2A	<i>NJ fact sheet:</i> Used as a research chemical.	**
Guanidine, N-methyl-N'-nitro-N-nitroso-	2A	<i>OHM/TADS:</i> Only commercial use is as a research chemical. May have been used in the late 1940s and 1950s in the laboratory preparation of diazomethane. Used for tumor induction and related research in experimental animals. Also used as a research mutagen.	**
Phenacetin	2A	<i>NJ fact sheet:</i> Used as a pain-killer medication.	**
Dichlorobenzidine	2B	<i>NJ fact sheet:</i> An intermediate in making dyes and pigments, and as a curing agent for Urethane foams.	**
Hexachlorocyclohexane (all isomers)	2B	<i>PAN database:</i> Insecticide	**
Heptachlor epoxide	2B	<i>PAN database:</i> Breakdown product; <i>OHM/TADS:</i> Not available as a commercial product in the US.	**
N-Nitrosodiethanolamine	2B	<i>OHM/TADS:</i> No evidence found for commercial production. Present at up to 3% in cutting fluids, comprising aqueous solutions of up to 45% triethanolamine and 18% sodium nitrite.	**
Azaserine	2B	<i>NJ fact sheet:</i> Used as an antibiotic and in biochemical research	**
Kepone	2B	<i>NJ fact sheet:</i> Used as an insecticide	**
Hydrazine, 1,2-diethyl-	2B	<i>NJ fact sheet:</i> Used in chemical laboratories as a research chemical	**
D-Glucose, 2-deoxy-2-[[methylnitrosoamino)-carbo	2B	<i>NJ fact sheet:</i> Used as a medicine to treat cancer.	**
Carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester (sulfallate)	2B	Not found in NJ Hazardous Substances Fact Sheets	**

N-Nitroso-N-methylurethane	2B	<i>NJ fact sheet:</i> Used as a research chemical.	**
Uracil mustard	2B	<i>NJ fact sheet:</i> Used as a medication against cancer.	**
Glycidylaldehyde	2B	<i>NJ fact sheet:</i> Used in the processing of wool and leather and in the manufacture of surgical sutures.	**
1,3-Butadiene, 2-methyl aka Isoprene	2B	<i>NJ fact sheet:</i> Used in the manufacture of synthetic natural rubber and in elastomer plastics. <i>KemI:</i> Used in 4 products.	HPV. **
Ethyl methanesulfonate	2B	Used in biochemical research and as an experimental mutagen. Monoesters of methanesulfonic acid have been considered for use as possible human male contraceptives and reversible male chemosterilants for insects and mammalian pests. (IMEMDT 0007) Used as a research tool and model compound to study mutagenesis and carcinogenesis, for example in <i>Escherichia coli</i> . Plant breeders use it for its mutagenic potential. (OHMTADS)	
Furan	2B	<i>NJ fact sheet:</i> Used in the manufacture of pharmaceuticals, agricultural chemicals, and other chemicals, and as a solvent for resins.	
Daunomycin	2B	<i>NJ fact sheet:</i> Used as a medicine in treating cancer.	
Lasiocarpine	2B	<i>NJ fact sheet:</i> Used as a research chemical.	
Mitomycin C	2B	<i>NJ fact sheet:</i> Used as an intravenous anti-cancer drug.	
DDT	2B	Chlorinated insecticide.	
DDD	2B	Chlorinated insecticide.	
DDE	2B	Breakdown product (PAN); DDE IS A PHOTOLYTIC, THERMAL, AND METABOLIC DEGRADATION PRODUCT OF DDT; IT IS NOT MANUFACTURED AS A COMMERCIAL PRODUCT. (OHM/TADS, expub.com)	
Methane, tetranitro-	2B	<i>NJ fact sheet:</i> Used as a rocket fuel, an additive to diesel fuel, and a reagent.	
Methylthiouracil, a.k.a. 4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	2B	<i>NJ fact sheet:</i> Used as a medication for the treatment of thyroid disease (anti-thyroid agent).	
N-Nitrosopyrrolidine	2B	Used as a research chemical.	

Fluorene, a.k.a. diphenylenemethane	3	<i>NJ fact sheet:</i> Used in resinous products, dyestuffs and as a chemical intermediate.	
Antu (synonym: Thiourea, 1-naphthalenyl)	3	<i>NJ fact sheet:</i> Primarily used to kill rodents.	
Carbamic acid, phenyl-, 1-methylethyl ester	3	Herbicide (OHMTADS, expub.com), Plant growth regulator (PAN). <i>KemI:</i> Not found in database.	
Maleic hydrazide	3	Used for weed control. <i>KemI:</i> Database indicates 0 tonnes, 0 products.	
2-Butenal, (e)-	3	Used in making other chemicals and as a warning agent in gas fuels. Reportable to EPA if used in quantities greater than 1000 lbs/yr. Has never been reported to EPA Region 1. <i>KemI:</i> Data supplied by fewer than 3 companies.	
Chlorodibromomethane	3	Used to manufacture fire extinguishing agents, aerosol propellants, refrigerants, and pesticides, and in organic synthesis. (OHM/TADS, expub.com) <i>KemI:</i> Database indicates 0 tonnes, 0 products.	**
Pyrene	3	Currently, there is no commercial production or use of this compound. (http://rais.ornl.gov/tox/profiles/pyrene_f_VI.shtml). Reportable to EPA if used above 1000 lbs/year. Has never been reported to EPA Region 1. <i>KemI:</i> Data supplied by fewer than 3 companies.	

Zirconium sulfate	3	Used as a chemical reagent and lubricant. <i>KemI</i> : Not found in database.	**
Carbamodithioic acid, diethyl-,sodium salt (sodium diethyldithiocarbamate)	3	No information found at this time. <i>KemI</i> : Reported at 0.4 tonnes; used in 4 products; data supplied by fewer than 3 companies.	
Benz[c]acridine	3	Occurs in engine exhaust. Found in coal combustion stack effluent, petroleum refinery incinerator effluents, and coal tar pitch volatiles from coke plants. (OHM/TADS, expub.com) <i>KemI</i> : Not found in database.	**
Mexacarbate	3	Carbamate pesticide which is no longer used in the United States. Reportable to EPA if used above 500 lbs/year. Has never been reported to EPA Region 1. <i>KemI</i> : Database indicates 0 tonnes, 0 products.	
Reserpine	3	Used as a medication. <i>KemI</i> : Not found in database.	
Dieldrin	3	Sprayed as a liquid to control insects and termites. Its use has been restricted by EPA to soil injection for termite control. <i>KemI</i> : Database indicates 0 tonnes, 0 products.	**
Endrin	3	An insecticide and to kill rodents. <i>KemI</i> : Database indicates 0 tonnes, 0 products.	
Saccharin and salts	3	Sodium or Calcium Saccharin is used in many low calorie or reduced calorie foods. Also used in toothpaste, mouthwash and other dental care products. <i>KemI</i> : Reported at 5.6 tonnes; used in 53 products. Main sectors reporting use: surface treatment and coating of metals; export. <i>Chemical Economics Handbook</i> : Saccharin is produced from toluene or phthalic anhydride; is a "high intensity sweetener." Used in personal care products, sweeteners, and industrial applications.	**
Thioperoxydicarbonic diamide,tetraethyl	3	Used as a fungicide, a seed disinfectant, in making rubber and as a prescription drug to treat alcoholism. <i>KemI</i> : Reported at 10 tonnes; used in 7 products; data supplied by fewer than 3 companies.	This chemical is a HPV. **
m-Nitrotoluene	3	Organic synthesis (OHM/TADS, expub.com) <i>KemI</i> : Data supplied by fewer than 3 companies.	This chemical is a HPV. **
o-Nitrotoluene	3	Not found in NJ Hazardous Substances Fact Sheets. <i>KemI</i> : Used in 2 products.	
p-Nitrotoluene	3	Not found in NJ Hazardous Substances Fact Sheets. <i>KemI</i> : 379.9 tonnes reported; used in 4 products.	
Acetaldehyde, trichloro-, a.k.a. chloral	3	Used to make Chloral hydrate and various pesticides.	
*Sources: <i>NJ</i> : New Jersey Hazardous Substance Fact Sheets and Oil and Hazardous Materials Technical Assistance Data System, accessed via ExPub, January-April 2008; <i>KemI</i> : Swedish Chemicals Inspectorate KemiStat database; <i>Chemical Economics Handbook</i> ; and PAN Database			

I. CERCLA Categories

Finally, the SAB considered 14 chemical categories that appear under CERCLA and have varying degrees of overlap with TRI categories:

- Glycol ethers
- Haloethers
- Halomethanes
- Phthalate esters
- Chlorinated naphthalene
- Endosulfan and metabolites
- Chlordane (technical mixture and metabolites)
- Chlorinated ethanes
- Chloroalkyl ethers
- Coke oven emissions
- DDT and metabolites
- Endrin and metabolites
- Fine mineral fibers
- Heptachlor and metabolites

Under current TURA reporting guidance, substances in these categories are not reportable unless they are also listed individually under TURA.

SAB recommendation. The SAB recommended retaining these categories on the TURA list. In future deliberations, the SAB will consider whether to define specific substances within these categories that would be reportable.

TURI recommendation. TURI supports the SAB's recommendation to retain these categories on the TURA list.

6. Regulatory Context

Appendix 3 shows selected regulatory information for each of the substances, including whether the substance is identified as an EPA Clean Water Act Priority Pollutant; appears on the EPA Clean Water Act 311 List of Hazardous Substances; appears on the EPA Superfund Amendments and Reauthorization Act (SARA) 302A Extremely Hazardous Substances List; appears as a hazardous constituent under the Resource Conservation and Recovery Act (RCRA); is regulated as a criteria air pollutant under the Clean Air Act; or meets the categorization criteria for the Government of Canada's Domestic Substances List categorization (indicating a need for further attention to these substances based on human health and/or environmental criteria).

7. Implications for the TURA Program

Since none of the substances considered here is currently reported under TURA, the immediate consequences of the Council's decisions on these substances for TURA filers and for the TURA program will be minimal.

Over the longer term, if facilities begin to use the substances on this list in larger quantities, facilities using substances that have been retained on the list may become subject to TURA requirements, while substances on which the Council takes no action will not be subject to these requirements.

For those substances on which the Council takes no action, the main effect will be to shorten the TURA list. The TURA program's approach to these substances will remain unchanged and implications for the TURA program are expected to be minimal. However, if use of any of these substances does increase, the TURA program will not receive data indicating this change. Thus, it will be particularly important for the TURA program to monitor emerging uses of these chemicals through other means.

Appendix 1: Summary of SAB recommendations

Summary of SAB recommendations		
Group	Date(s) Considered by SAB	SAB Recommendation (All votes were unanimous unless otherwise noted.)
Acetates	1/29/08, 3/24/08, 5/20/08	Vote to retain uranyl acetate. The Board took no action on the remaining substances.
Amines	1/29/08	Vote to retain all substances in this group.
Ammonium Compounds	1/29/08	Vote to retain 5 substances: ammonium carbamate, ammonium sulfide, ammonium picrate, ammonium benzoate, and ammonium carbonate. The Board recommended taking no action on the remaining 13 substances.
Benzene related compounds	1/29/08	1/29/08: Vote to retain all except dodecylbenzene sulfonates. 3/24/08: The Board reviewed dodecylbenzene sulfonates and voted to retain.
Pesticides	1/7/08, 3/24/08	1/7/08 Vote to retain all banned and restricted pesticides. 3/24/08 Vote to retain remaining pesticides with the exception of: Ethanimidithioic acid, 2-(dimethylamino-n-hydroxy-2-oxo-, methyl ester (A2213); Carbamodithioic acid (hydroxymethyl) methyl-, monopotassium salt, (potassium n-hydroxymethyl -n-methyldithiocarbamate); Thiofanox; Carbamic acid, dimethyl-, 1-[(dimethylamino)carbonyl]-5-methyl-1H-pyrazol-3-y-1 ester; sec-Butylamine (this appears under two CAS numbers); Methanimidamide N,N-dimethyl-N-[2-methyl-4-[[[(methylaino)carbonyl]oxy]phenol]-
Phenols	1/29/08	Vote to retain all substances in this group.
Non-categorized	3/24/08	Vote to retain all chemicals in this group with the exception of: Piperidine, Sulfur phosphide, Sodium bifluoride, Zirconium potassium fluoride, Acenaphthylene, 1,3-Pentadiene, Ferric fluoride, iso-Butyric acid, Zirconium tetrachloride, ferric nitrate, carbamodithionic acid dibutyl sodium salt. Of those recommended for retention, 16 substances were identified as potential Higher Hazard Substances.
IARC 1, 2, 3	1/7/08	Vote to retain all IARC 1, 2, & 3 carcinogens.
CERCLA Categories	3/24/08, 5/20/08	Vote to retain all CERCLA categories.

¹ 42 US Code Section 9601(14).

² IARC Group 1: the agent is carcinogenic to humans; Group 2: the agent is probably or possibly carcinogenic to humans; Group 3: the agent is not classifiable as to its carcinogenicity to humans.
<http://monographs.iarc.fr/ENG/Preamble/CurrentPreamble.pdf>, p. 22,23

³ EPA PBT Profiler, available at <http://www.epa.gov/oppt/sf/tools/pbtprofiler.htm>.

⁴ Scorecard's list of suspected neurotoxicants, and the sources used to compile the list, is available at <http://www.scorecard.org/health-effects/> (select the link for neurotoxicity). Information on neurotoxicity of methylethylketone is drawn from the Fisher Scientific Material Safety Data Sheet (MSDS) for the substance.

⁵ The California Proposition 65 List is available at http://www.oehha.org/prop65/prop65_list/Newlist.html. Additional information is drawn from the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS); ReproEXPERT; Material Safety Data Sheets; and information presented by SAB members.

⁶ The EU Consolidated CMR List is available at <http://www.chemicalspolicy.org/downloads/cmrlist.pdf>. Additional information is drawn from the US National Library of Medicine Toxicology Data Network (TOXNET).

⁷ EPA Integrated Risk Information System, available at <http://www.epa.gov/iris/>.

⁸ REL, TLV-TWA, and TLV-STEL are drawn from the National Institutes of Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, available at <http://www.cdc.gov/niosh/npg/>.

⁹ Kemi-stat database available at <http://apps.kemi.se/kemistat/start.aspx?sprak=e>.

¹⁰ SRI International, *Chemical Economics Handbook* (Menlo Park, CA).