Toxics Use Reduction Institute

Policy Analysis: Recommendations on CERCLA chemicals that were previously recommended for no action and are not currently reported by TURA filers

July 14, 2009

Statutory amendments to the Toxics Use Reduction Act (TURA) in 2006 required the Science Advisory Board (SAB) and TURI to review the existing chemicals on the TURA Toxic or Hazardous Substance List originating from the CERCLA chemical list and make a recommendation to the Council as to which chemicals should be retained. The Council has until August 1, 2009, to make decisions taking these recommendations into account. The goal of this process is to help facilities focus their efforts more closely on substances that present greater hazards to human health and the environment in Massachusetts.

The CERCLA chemicals in this document are chemicals which:

- The SAB initially recommended for 'no action' ,
- Are not currently reported by TURA filers (and may never have been reported), and
- The SAB has not re-reviewed

These substances were initially recommended for 'no action' in the bulk review by the SAB. The Administrative Council asked that the SAB review the chemicals that were currently reported in more depth. These chemicals which are **not** currently reported, were not further reviewed. This document presents previously existing information on all 42 of these substances.

This policy analysis presents the scientific information reviewed by the Science Advisory Board in developing its initial recommendations.

Based on the information presented here, TURI supports the SAB's recommendations to take no action on all 42 of the substances.

1. Overview

To facilitate the review process for this group of chemicals, TURI and the SAB broke the substances down into five groups. Two groups (Acetates and Ammonium Compounds) are defined by chemical structure. One group (Pesticides) is defined by use category; one group (Chemicals Previously Reported) is defined by reporting status, and a final group (Non-categorized) contains all substances that did not fall into one of the other categories.

2. Information considered by the SAB

The SAB considered the following data (below). 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.

- International Agency for Research on Cancer (IARC) rating. The SAB recommended retaining any substance that has an IARC rating (Group 1, 2, or 3) [1].
- Data from the EPA PBT profiler (persistence in water, soil, sediment, and air; bioconcentration factor; and chronic toxicity in fish).[2]

- Neurotoxicity (based on Scorecard's list of suspected neurotoxicants, and other sources in some cases).[3]
- Developmental/reproductive toxicity (based primarily on California's Proposition 65 list, and other sources in some cases).[4] 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).[5] 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).
- Exposure limits required or recommended by federal agencies, including reference dose and reference concentration (RfD and RfC, from EPA Integrated Risk Information System)[6]; 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).[7] 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 is currently reported under TURA, indicating that none is "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.[8] 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 CERLCA 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.[9]

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

SAB recommendation. Based on hazard, the SAB has recommended taking no action on these 5 acetates. 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.

Use information. Use information for the 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 take no action on the five acetates. 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)**
Recommended by the SAB for no action:	
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. Ammonium Compounds

SAB recommendation. Based on hazard, SAB recommended no action on 13 compounds.

- Table B shows use information for the 13 substances recommended for no action by the SAB.

TURI recommendation.

- TURI supports the SAB's recommendation to take no action on the 13 substances listed in Table B.
- 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 B: 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)	*Chemical Economics Handbook:* 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. *Chemical Economics Handbook:* "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	

C. Pesticides

SAB recommendation.

- The SAB recommended no action on 6 pesticides (see Table C). 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 C: Pesticides recommended by the SAB for no action	
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-methyldithiocarbamate)	Agricultural Chemical
Carbamates:	

Thiofanox	Insecticide
Amines:	
sec-Butylamine	Fungistat
sec-Butylamine	Agricultural Chemical
Phenols:	
Methanimidamide, N,N-dimethyl-N-[2-methyl-4-[[(methylaino)carbonyl]oxy]phenol]-	Carbamate pesticide
*Sources: *NJ*: New Jersey Hazardous Substance Fact Sheets, accessed via ExPub, January-April 2008; *KemI:* Swedish Chemicals Inspectorate KemiStat database; Chemical Economics Handbook; and PAN Database	

D. 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.

- The SAB recommended no action on 10 substances. These are listed in Table D.

TURI recommendation. Based on policy recommendations from the Advisory Committee, TURI supports all of the SAB's recommendations on these substances.

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.

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

Chemical name	***Use information**
Piperidine, 1,1-(tetrathiodicarbonothioyl)-bis-(Bis(pentamenthylene) thiuram tetrasulfide)	*KemI:* 2,9 tonnes reported; used in 8 products; data supplied by fewer than 3 companies.
Sulfur phosphide	*NJ fact sheet:* Used in the production of safety matches, lube oil additives, and pesticides.
Sodium bifluoride	*NJ fact sheet:* Used as an antiseptic, a preservative, and a stone cleaner, and in etching glass, leather bleaching, and laundry procedures, and tin plate production. *KemI:* 8,5 tonnes reported in 8 products; data supplied by fewer than 3 companies.
Zirconium potassium fluoride	*NJ fact sheet:* Used in manufacturing metallic zirconium and as a catalyst. *KemI:* Data supplied by fewer than 3 companies.
Acenaphthylene	No use information available in NJ fact sheets or KemI database.
1,3-Pentadiene	*NJ fact sheet:* Used in the production of polymers
Ferric fluoride	*NJ fact sheet:* Used as a catalyst, fluorinating agent and medication.
Carbamodithioic acid dibutyl sodium salt	No use information available in NJ fact sheets or KemI database.
iso-Butyric acid	*NJ fact sheet:* Used in the production of solvents, flavors, perfumes, varnishes and disinfectants, and in tanning hides.
Zirconium tetrachloride	*NJ fact sheet:* Used as a Friedel-Crafts catalyst, and as a medication.

E. Chemicals previously reported

This group of 9 chemicals was one of the first reviewed as part of all the CERCLA chemicals that had ever been reported. Thus, the format of the information about them is slightly different. These chemicals were once reported under TURA, but are not currently reported.

CAS#	Chemical Name	Date(s) Considered by SAB	Justification Note: Unless otherwise noted, votes were unanimous.
10045-89-3	Ferrous ammonium sulfate (anhydrous)		Board discussed worker exposure issues as principal concern; deemed not significant.
7720-78-7	Ferrous sulfate		Board discussed worker exposure issues as principal concern; deemed not significant.
10102-43-9	Nitric oxide	12/19/2007	Transient existence. 5 voted to take no action, 2 opposed, 1 abstaining.
107-92-6	Butyric acid	10/17/2007	Nuisance smell and persistent in air.
117-84-0	Di-n-octyl phthalate	6/25/07; 10/17/07; 12/19/2007	This substance is often confused with other phthalates, such as DEHP. Principal concerns relate to possible binding with estrogen receptors. Data indicate that the substance does not bind with estrogen receptors.
124-41-4	Sodium methylate	10/17/2007	Persistent in air; no other concerns.
540-88-5	tert-Butyl acetate	10/17/2007	The flammability and flash point were discussed for tert butyl acetate. The flash point is 72°F. The vapor pressure is low.
5952-26-1	Ethanol,2,2-oxybis,dicarbamate (diethylene glycol,dicarbamate)	6/25/07; 12/19/2007	This chemical has a high persistence in sediment; however, its LD50 is very high and does not present other concerns.
7681-49-4	Sodium fluoride	6/4/07; 6/25/07; 7/16/2007	For sodium fluoride, it was noted that two 2-year studies showed it was negative for carcinogenicity but also showed reproductive effects. It is approved for use in toothpaste, and is regulated by EPA as a pesticide and insecticide. About 30 to 40 drinking water systems in the state use it for fluoridating water.

6. 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.

[1] 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

[2] EPA PBT Profiler, available at http://www.epa.gov/oppt/sf/tools/pbtprofiler.htm.

[3] 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.

[4] 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.

[5] 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).

[6] EPA Integrated Risk Information System, available at http://www.epa.gov/iris/.

[7] 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/.

[8] KemI-stat database available at http://apps.kemi.se/kemistat/start.aspx?sprak=e.

[9] SRI International, *Chemical Economics Handbook* (Menlo Park, CA).