

## *Toxics Use Reduction Institute*

### *Policy Analysis: Recommendation to retain certain CERCLA chemicals that have 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 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, 2008, 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 SAB has considered the CERCLA chemicals in two broad groups: chemicals that have been reported at some point by TURA filers, and chemicals that have never been reported by TURA filers. This document presents information on those chemicals that:

- Have been reported by TURA filers, and
- Are recommended for retention on the TURA list.

The TURA Science Advisory Board (SAB) has recommended retaining the CERCLA substances discussed in this document. If these substances are retained on the TURA list, facilities subject to TURA and using these substances above reporting thresholds will continue to be required to file an annual toxics use report, pay an annual toxics use fee, and develop a toxics use reduction plan every two years for these substances.

This policy analysis presents the scientific information reviewed by the Science Advisory Board in developing its recommendations. In addition, it summarizes information for the most recent year in which the substance was reported, the number of filers that reported use of the substance in the most recent reporting year, and regulations that apply to these substances at the state, federal, and international levels. Based on the information presented here, TURI supports the SAB's recommendations to retain these CERCLA substances.

#### **1. Substances recommended for retention**

Appendix A is a list of CERCLA substances recommended for retention on the TURA list.

#### **2. Basis for SAB recommendations**

The discussion below provides an overview of the information considered by the SAB. Points discussed by the SAB are summarized briefly in Appendix A, and the specific data for each substance are shown in Appendix C. In addition to the data shown in Appendix C, in many instances individual SAB members brought additional scientific information to the meeting.

The substances recommended by the SAB for retention on the TURA list pose concerns based on health, safety, or environmental criteria. 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.

In reviewing the substances, 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). Eleven substances were retained on this basis.
- Data from the EPA PBT profiler (persistence in water, soil, sediment, and air; bioconcentration factor; and chronic toxicity in fish).<sup>1</sup>
  - A number of the substances recommended for retention on the TURA list have a high persistence value in at least one medium. The SAB considered high persistence in sediment or soil to be a particular source of concern.
- Neurotoxicity (based on Scorecard's list of suspected neurotoxicants, and other sources in some cases).<sup>2</sup>
  - Of the substances recommended for retention, four (methylethylketone, 1,2-Ethanediamine, 1,1'oxybis-ethane, and diethylphthalate) are identified as neurotoxicants.
- Developmental/reproductive toxicity (based primarily on California's Proposition 65 list, and other sources in some cases).<sup>3</sup>
  - Of the substances recommended for retention, ten are listed as reproductive or developmental toxicants: nitrogen dioxide; caprolactam; 1,2-ethanediamine; Dodecylbenzenesulfonic acid; Ethylenediamine-tetraacetic acid (EDTA); N,N-dimethyl-Methanamine; Potassium permanganate; isophorone; butyl benzyl phthalate; and diethyl phthalate.
- Mutagenicity (based on the European Union's Consolidated List of Carcinogens, Mutagens, and Reproductive Toxicants [CMR], and other sources in some cases).<sup>4</sup>
  - Two of the substances recommended for retention are listed as mutagens: nitrogen dioxide and 1,2-ethanediamine. In both cases, the SAB cited the mutagenicity of these substances as a basis for retention.

---

<sup>1</sup> EPA PBT Profiler, available at <http://www.epa.gov/oppt/sf/tools/pbtprofiler.htm>.

<sup>2</sup> 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.

<sup>3</sup> The California Proposition 65 List is available at [http://www.oehha.org/prop65/prop65\\_list/Newlist.html](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.

<sup>4</sup> 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).

- 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
  - Reference dose and reference concentration (RfD and RfC, from EPA Integrated Risk Information System).<sup>5</sup> The SAB did not emphasize the RfD or the RfC as the primary reason for any of its recommendations to retain substances. However, the RfD and RfC served as contextual information contributing to the SAB's over-all assessment for each substance.
  - ATSDR Minimum risk level (MRL). MRL's are not available for most of the substances discussed here. However, in a few cases the SAB took the MRL into account in developing its recommendation.
  - NIOSH Recommended Exposure Limit (REL); Threshold Limit Value – Time Weighted Average (TLV-TWA); and Threshold Limit Value – Short Term Exposure Limit (TLV-STEL).<sup>6</sup> In several instances, the SAB cited a low REL, TLV (TWA), or TLV (STEL) as an important factor in its recommendation to retain a given substance.
- Flash point. A number of the substances recommended for retention have relatively low flash points. The SAB cited flash point in particular as a basis for concern about 1,1'-oxybis-ethane, which has a flash point of -49 degrees Fahrenheit, and for acetone, which was also the subject of a past delisting petition.
- Past delisting petitions. If a substance was the subject of a past delisting petition which failed and there is no new information regarding the substance, the Board deferred to its previous decision to retain.

### 3. Use Information

As shown in Appendix B, the majority of the substances recommended for retention on the TURA list have been reported by TURA filers within the last three years for which data are available (2003 to 2005). A few of the substances have not been reported in recent years, and in some cases may have been reported in error.

The number of filers is variable. Most substances are reported by fewer than 10 filers, while a few are reported by more than a hundred.

### 4. Regulatory Context

Appendix B shows selected regulatory information for each of the substances.

- Five of the substances are identified as EPA Clean Water Act Priority Pollutants. Thirty-one of the substances are identified on the EPA Clean Water Act 311 List of Hazardous Substances.
- Seven of the substances are found on the EPA Superfund Amendments and Reauthorization Act (SARA) 302A Extremely Hazardous Substances List.

<sup>5</sup> EPA Integrated Risk Information System, available at <http://www.epa.gov/iris/>.

<sup>6</sup> 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/>.

- Eight of the substances are listed as hazardous constituents under the Resource Conservation and Recovery Act (RCRA).
- None of the substances have maximum contaminant levels (MCLs) under the Safe Drinking Water Act.
- Three of the substances are regulated as hazardous air pollutants under the Clean Air Act.
- All but three of the substances are on the New Jersey Right-to-Know list. All are on the Pennsylvania Hazardous Substances list.
- Twenty-six of the substances meet the categorization criteria for the Government of Canada's Domestic Substances List categorization, indicating that there is a need for further attention to these substances based on human health and/or environmental criteria.

## **5. Implications for the TURA Program**

Retaining these substances on the TURA list will mean that the TURA program's approach to these substances will remain unchanged. TURA-covered facilities will continue to be subject to reporting, planning, and fee requirements for these substances. The TURA program will continue to provide services to assist facilities in reducing their use of these substances.

**Appendix A: Information from SAB Minutes used in consideration of chemical retention**

**Chemicals recommended for retention by the Science Advisory Board**

<b>CAS#</b>	<b>Chemical Name</b>	<b>Date(s) Considered by SAB</b>	<b>Justification</b>  Note: Unless otherwise noted, votes were unanimous.
64-19-7	Acetic acid (concentrations of 12% or less are NOT reportable)	3/20/07; 4/23/2007	In response to a past delisting request, the SAB recommended retaining due to corrosivity. The SAB also recommended designation as a lower hazard substance. The SAB believed there was no reason to change its past recommendation.
67-64-1	Acetone	3/20/07; 4/23/2008	In response to a past delisting request, the SAB recommended retaining due to flammability and high vapor pressure. The SAB also recommended designation as a lower hazard substance. The SAB believed there was no reason to change its past recommendation.
141-78-6	Ethyl Acetate	4/23/07; 6/4/07; 6/25/07; 7/16/07	In response to a past delisting request, the SAB recommended retaining. Recommendation based primarily on its potential for acute toxicity to workers. The SAB also recommended designation as a lower hazard substance. The SAB believed there was no reason to change its past recommendation.
78-83-1	Isobutyl Alcohol	6/4/07; 7/16/07	LD50, Chronic Fish Toxicity, and TWA are lower than those for several other retained chemicals.
78-93-3	Methylethylketone	3/20/07; 6/4/07; 6/25/07; 7/16/07	The SAB previously categorized MEK as less hazardous. Information from EPA's delisting was reviewed. The SAB believed it should be consistent with its past actions and recommended retaining MEK and designating as a lower hazard substance.
10022-70-5	Sodium hypochlorite pentahydrate	10/17/2007	IARC 3 rating.
10025-87-3	Phosphorus oxychloride	10/17/2007	Low STEL and TLV, high persistence in air, and acute irritant qualities.
10102-44-0	Nitrogen dioxide	12/19/2007	Low TLV-STEL and inhalation hazard.
107-15-3	1,2-Ethanediamine	12/19/2007	Acutely toxic with low PEL and REL.
108-46-3	Resorcinol	10/17/2007	IARC 3 rating.
108-94-1	Cyclohexanone	10/17/2007	IARC 3 rating.
109-89-7	Diethylamine	12/19/2007	Acutely toxic with low PEL and REL.
123-62-6	Propionic anhydride	10/17/07; 12/19/07	Irritant potential, persistence in air, and comparison to acetic acid/anhydride. 6 votes to retain, 1 abstaining.

1310-58-3	Potassium hydroxide	10/17/2007	Compared to sodium hydroxide. Same TLV ceiling as sodium hydroxide; low pH; worker hazard; respiratory tract irritant.
1336-21-6	Ammonium hydroxide	10/17/2007	Compared to sodium hydroxide. Same TLV ceiling as sodium hydroxide; low pH; worker hazard; respiratory tract irritant.
16721-80-5	Sodium hydrosulfide	12/19/2007	Corrosivity.
25155-30-0	Sodium dodecylbenzenesulfonate	6/25/07; 10/17/07; 12/19/2007	Ecological effects.
27176-87-0	Dodecylbenzenesulfonic acid	6/25/07; 10/17/07; 12/19/2007	Ecological effects
540-84-1	2,2,4-Trimethylpentane	10/17/2007	Persistence in sediment.
60-00-4	Ethylenediamine-tetraacetic acid (EDTA)	12/19/2007	Low LD50 and persistence in sediment. 5 votes to retain, 1 opposed, 1 abstaining.
60-29-7	Ethane, 1,1'-oxybis-	12/19/2007	Retained due to persistence, flammability, peroxide formation, low vapor pressure, and ability to act as a CNS depressant.
7440-23-5	Sodium	12/19/2007	High reactivity.
75-04-7	Ethanamine	12/19/2007	Acutely toxic with low PEL and REL.
75-20-7	Calcium carbide	10/17/2007	IARC 3 rating.
75-50-3	Methanamine, N,N-dimethyl-	12/19/2007	The SAB discussed the amines as a group. All are acutely toxic with low PELs and RELs. The SAB voted to retain all four.
7631-90-5	Sodium bisulfite	12/19/2007	IARC 3 rating.
7778-54-3	Calcium hypochlorite	10/17/07; 12/19/2007	Retained due to IARC 3 rating.
78-59-1	Isophorone	6/25/07; 10/17/2007	Evidence of fetal malformations, persistence in soil, EPA Class C (possible carcinogen) rating, and low TWA.
79-09-4	Propionic acid	12/19/2007	Irritant potential, persistence in air, and comparison to acetic acid/anhydride. 4 voted to retain, 2 opposed, 1 abstaining.
98-01-1	Furfural	6/25/07; 10/17/2007	IARC 3 rating.
107-12-0	Propanenitrile (ethyl cyanide)	6/4/07; 6/25/07; 7/16/07	It is a cyanide compound and cyanide compounds are on the more hazardous list. Information from EPA indicates this substance is not clearly covered in the cyanide category.
108-24-7	Acetic anhydride	6/4/2007	It is more toxic than acetic acid, which has been retained.
108-98-5	Benzenethiol	4/23/07; 6/4/2007	LD50.
109-99-9	Furan, tetrahydro-	4/23/07; 6/4/2007	LD50.

12125-01-8	Ammonium fluoride	6/4/07; 6/25/07; 7/16/07	Ability to dissociate into HF in solution.
1310-73-2	Sodium hydroxide	4/23/2007	Decision based primarily on its potential for acute toxicity to workers. SAB previously recommended against a delisting petition; no new information to support changing this recommendation. Four voted to retain, 1 abstaining.
1341-49-7	Ammonium bifluoride	6/4/07; 6/25/07; 7/16/07	Ability to dissociate into HF in solution.
156-60-5	1,2-Dichloroethylene	4/23/07; 6/4/2007	LD50.
30525-89-4	Paraformaldehyde	4/23/07; 6/4/2007	LD50.
7681-52-9	Sodium hypochlorite	6/25/07; 7/16/07	SAB previously recommended against a delisting petition due to environmental toxicity and reactivity; no new information to support changing this recommendation.
7790-94-5	Chlorosulfonic acid	4/23/07; 6/4/2007	Retained due to LD50.
7664-93-9	Sulfuric acid	1/30/07; 6/4/07	IARC 1 rating.
8014-95-7	Sulfuric acid (fuming) (a.k.a. oleum)	6/25/2007; 12/19/07	IARC 1 rating.
85-68-7	Butyl benzyl phthalate (BBP)	4/23/07; 6/4/07	A previous delisting petition for this substance failed. <sup>7</sup> New information documents developmental & reproductive toxicity and ubiquitous presence in the environment.
95-57-8	2-Chlorophenol	4/23/07; 6/4/2007	LD50.
65-85-0	Benzoic Acid	1/29/08	Retained with all benzene related compounds
84-66-2	Diethylphthalate	5/20/08	The SAB made an initial recommendation to take no action on this substance. However, the SAB has requested information regarding conflicting studies, and will revisit this recommendation at its next meeting. Therefore, TURI recommends retaining this substance until that review is complete.
7664-38-2	Phosphoric Acid	5/20/08	Retained due to worker hazard.

<sup>7</sup> In 1996 the SAB reviewed a delisting petition for BBP and recommended delisting it. However, at the time there was rapidly emerging new information about the substance. Therefore, TURI recommended retaining the substance and the Administrative Council voted not to delist it. Additional information about the substance has emerged since that time, and was reviewed by the SAB, leading to the recommendation to retain it.

**Appendix B - Additional information on substances recommended for retention**

Regulatory Data

Cas #	Chemical Name	Last Reported	Number of Filers	EPA Clean Water Act 126 Priority Pollutants	EPA Clean Water Act 311 List of Hazardous Substances	EPA SARA 302A Extremely Hazardous Substances List	Hazardous Constituents (Resource Conservation and Recovery Act)	Hazardous Air Pollutants (Clean Air Act)	NJ Right to Know List	PA Hazardous Substances List	Meets Canadian substances categorization criteria
64-19-7	Acetic acid (concentrations of 12% or less are NOT reportable)	2005	20	-	Y	-	N	N	Y	Y	Y
67-64-1	Acetone	2005	54	-	-	-	N	N	Y	Y	Y
141-78-6	Ethyl Acetate	2005	29	-	-	-	N	N	Y	Y	N
78-83-1	Isobutyl Alcohol	2005	3	-	-	-	N	N	Y	Y	Y
78-93-3	Methylethylketone	2005	36	-	-	-	Y	Y	Y	Y	Y
10022-70-5	Sodium hypochlorite pentahydrate	1999	1	-	Y	-	N	N	N	Y	-
10025-87-3	Phosphorus oxychloride	2003	1	-	Y	Y	N	N	Y	Y	N
10102-44-0	Nitrogen dioxide	2005	2	-	Y	Y	Y	N	Y	Y	N
107-15-3	1,2-Ethanediamine	2005	1	-	Y	Y	N	N	Y	Y	Y
108-46-3	Resorcinol	2003	1	-	Y	-	Y	N	Y	Y	Y
108-94-1	Cyclohexanone	2005	6	-	-	-	N	N	Y	Y	Y
109-89-7	Diethylamine	1994	1	-	Y	-	N	N	Y	Y	N
123-62-6	Propionic anhydride	2005	1	-	Y	-	N	N	Y	Y	N
1310-58-3	Potassium hydroxide	2005	27	-	Y	-	N	N	Y	Y	Y
1336-21-6	Ammonium hydroxide	2002	3	-	Y	-	N	N	Y	Y	Y

Cas #	Chemical Name	Last Reported	Number of Filers	EPA Clean Water Act 126 Priority Pollutants	EPA Clean Water Act 311 List of Hazardous Substances	EPA SARA 302A Extremely Hazardous Substances List	Hazardous Constituents (Resource Conservation and Recovery Act)	Hazardous Air Pollutants (Clean Air Act)	NJ Right to Know List	PA Hazardous Substances List	Meets Canadian substances categorization criteria
27176-87-0	Dodecylbenzenesulfonic acid	2005	4	-	Y	-	N	N	Y	Y	N
540-84-1	2,2,4-Trimethylpentane	2005	1	-	-	-	N	Y	Y	Y	N
60-00-4	Ethylenediamine-tetraacetic acid (EDTA)	2002	1	-	Y	-	N	N	Y	Y	Y
60-29-7	Ethane, 1,1'-oxybis-	2005	1	-	-	-	N	N	Y	Y	Y
7440-23-5	Sodium	2003	1	-	Y	-	N	N	Y	Y	N
75-04-7	Ethanamine	2005	2	-	Y	-	N	N	Y	Y	N
75-20-7	Calcium carbide	1992	1	-	Y	-	N	N	Y	Y	N
75-50-3	Methanamine, N,N-dimethyl-	2000	1	-	Y	-	N	N	Y	Y	N
7631-90-5	Sodium bisulfite	2005	8	-	Y	-	N	N	Y	Y	Y
7778-54-3	Calcium hypochlorite	2003	1	-	Y	-	N	N	Y	Y	Y
78-59-1	Isophorone	2003	1	Y	307A	-	N	Y	Y	Y	Y
79-09-4	Propionic acid	2005	2	-	Y	-	N	N	Y	Y	Y
98-01-1	Furfural	2005	1	-	Y	-	N	N	Y	Y	Y
107-12-0	Ethyl cyanide	1999	1	-	-	Y	Y	N	Y	Y	N
107-12-0	Propanenitrile	1999	1	-	-	Y	Y	N	Y	Y	N
108-24-7	Acetic anhydride	2005	1	-	Y	-	N	N	Y	Y	Y
108-98-5	Benzenethiol	2005	1	-	-	Y	Y	N	Y	Y	N
109-99-9	Furan, tetrahydro-	2005	6	-	-	-	N	N	Y	Y	Y
12125-01-8	Ammonium fluoride	2005	3	-	Y	-	N	N	Y	Y	Y

Cas #	Chemical Name	Last Reported	Number of Filers	EPA Clean Water Act 126 Priority Pollutants	EPA Clean Water Act 311 List of Hazardous Substances	EPA SARA 302A Extremely Hazardous Substances List	Hazardous Constituents (Resource Conservation and Recovery Act)	Hazardous Air Pollutants (Clean Air Act)	NJ Right to Know List	PA Hazardous Substances List	Meets Canadian substances categorization criteria
1310-73-2	Sodium hydroxide	2005	176	-	Y	-	N	N	Y	Y	Y
1341-49-7	Ammonium bifluoride	2005	3	-	Y	-	N	N	Y	Y	Y
156-60-5	1,2-Dichloroethylene	2005	1	Y	-	-	N	N	N	Y	N
30525-89-4	Paraformaldehyde	2005	1	-	Y	-	N	N	Y	Y	Y
7681-52-9	Sodium hypochlorite	2005	36	-	Y	-	N	N	Y	Y	Y
7790-94-5	Chlorosulfonic acid	2005	1	-	Y	-	N	N	Y	Y	N
8014-95-7	Sulfuric acid (fuming), a.k.a. oleum	2003	1	-	-	-	N	N	N	Y	-
7664-93-9	Sulfuric acid	2005	110	-	Y	Y	N	N	Y	Y	Y
85-68-7	Butyl benzyl phthalate	2005	2	Y	-	-	N	N	Y	Y	Y
95-57-8	2-Chlorophenol	1990	1	Y	307A	-	Y	N	Y	Y	N
65-85-0	Benzoic Acid	2005	1	-	Y	-	N	N	Y	Y	N
84-66-2	Diethylphthalate	2005	1	Y	N	-	Y	N	Y	Y	N
7664-38-2	Phosphoric Acid	2005	40	-	Y	-	N	N	Y	Y	Y

Key: Y = found on list; N = does not meet criteria; - = not found on list or in database; 307A = substance located on EPA Clean Water Act 307A Toxic Pollutants list