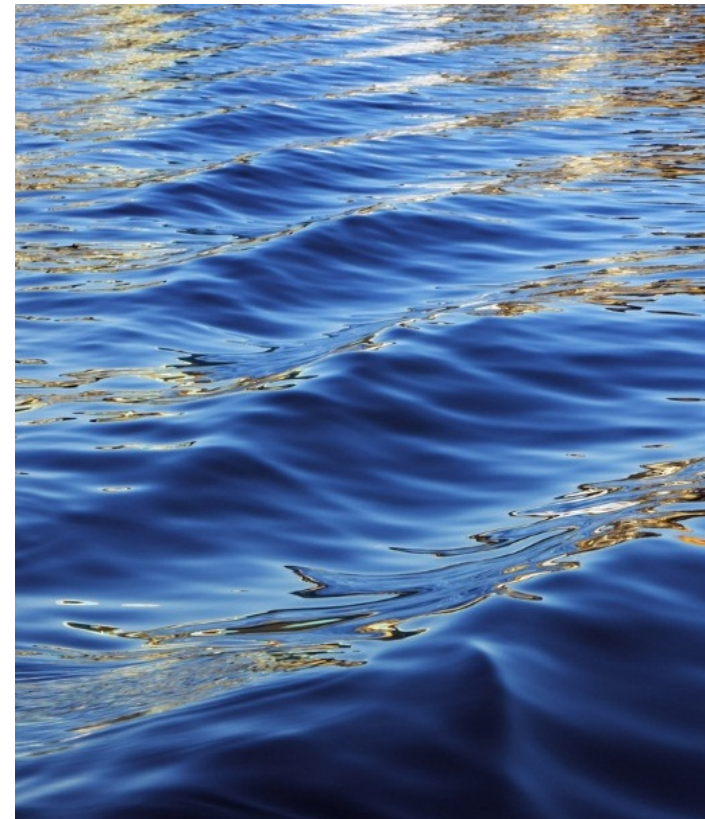




SAB More Hazardous Chemicals

June 1, 2026

TURA Science Advisory Board Meeting



Original Categorization project (1999)

- Categorized the 258 chemicals that had been reported under TURA at that point
- Into more hazardous, less hazardous, and uncategorized
- The list was informational

Data Points in four major areas

- Human health
- Environment
- Safety
- Persistence/bioaccumulation

Eight Criteria

- Carcinogenicity
- Oral LD50
- Reference Dose (RfD)
- Threshold Limit Value (TLV)/time weighted average (TWA)
- Aquatic LC50
- Flash Point (FP)
- pH (used pKa and pKb)
- Bioconcentration factor (BCF)

Categorization Method

- The Board considered several methods used by other authoritative bodies, including algorithms
- Chose Delphi Expert Judgment method
- Expert vote ranking to consider diversity of opinion
 - *If the opinion of one expert on an uncertain point is useful, the opinion of many combined is better*
 - *Obtain the most reliable consensus of opinion of a group of experts*

Categorization Results

Table 1: Category 1 Chemicals ²		
Acrylamide	Diethylsulfate	Nickel compounds
Acrylonitrile	Dimethylformamide	Nitrobenzene
Arsenic compounds	Dioxane	Phosgene
Arsenic	Epichlorohydrin	Propyleneimine
Cadmium compounds	Ethylene oxide	Propyleneoxide
Cadmium	Formaldehyde	Selenium and selenium compounds
Carbon tetrachloride	Hydrazine	Silver chromate
Chlorine	Hydrogen cyanide	Sulfuric acid
Chloroform	Hydrogen fluoride	Sulfuric acid (fuming)
Chromic acid	Lead	Tetrachloroethylene
Chromium compounds (+6)	Lead compounds	Toluenediisocyanate
Cyanide compounds	Methylene bisphenyl isocyanate	Trichloroethylene
Dibromochloropropane		
Dichloroethane		

Categorization Results

Table 2: Category 2 Chemicals³

Acetic acid	Ferrous chloride
Acetone	Ferrous sulfate
Ammonium bicarbonate	Isobutyl alcohol
n-Butyl alcohol	Methylethylketone
sec-Butyl alcohol	Methanol
Chromium compounds (+3)	Silver in alloy form
Ethyl acetate	Sodium phosphate, dibasic
Ethylene glycol	Sodium phosphate, tribasic
Ferric chloride	Zinc in alloy form
Ferric sulfate	Zinc borate
Ferrous ammonium sulfate	Zinc sulfate

Categorization Continued (2000s)

- PBTs, then remaining EPCRA 313 chemicals
- PBT:6 additional chemicals added to the “More Hazardous” list
- 313 Result: 53 chemicals added to "More Hazardous" list

Additional PBTs

- Mercury and Mercury Compounds
- PACs and Benzoperylene
- Tetrabromobisphenol A (TBBPA)
- Dioxin

Additional 313 Chemicals

1-bromopropane (n-propyl bromide, nPB)	Beryllium and beryllium compounds	Dibromoethane	Malononitrile	Pentachlorophenol
1,2,3-trichloropropane	Beta-naphthylamine	Dichlorvos	MCPA	Phenol
1,3 butadiene	Bis (tributyltin) oxide	Dinoseb	Methoxychlor	Propyleneimine
2,4 Dinitrotoluene	Bischloromethyl ether	Dioxane	Methyl parathion	Sodium Azide
2,6 Dinitrotoluene	Carbofuran	Fluoroacetic acid	Mixed Dinitrotoluene	Sodium pentachlorophenate
4 biphenylamine	Chlordane	Heptachlor	Nitrofen	Toxaphene
4,4'-Methylene-bis (2-Chloroaniline)(MOCA)	CI Direct Black 38	Hexachloro-1,3-butadiene	Nitrosodiethylamine	Trifluralin
Aldrin	CI Direct Blue 6	Hexachlorobenzen e	Octachloronaphthalene	Vinyl chloride
Aluminum phosphide	Crystalline Silica	Hexachlorophene	Osmium tetroxide	
Benzene	DEF	Isodrin	Paraquat dichloride	
Benzidene	Dibenzofuran	Lindane	Pendimethalin	

2006 Amendments

- Established regulatory process for HHS/LHS
- HHS have lower thresholds
- LHS have no per chemical fee
- Up to 10 HHS/LHS can be designated per year
- 14 HHS, 10 LHS recommended/designated thus far

TURA Higher Hazard Substances

- Cadmium and Cadmium Compounds (2008)
- Trichloroethylene (2008)
- Perchloroethylene (2009)
- Formaldehyde (2012)
- Hexavalent Chromium (2012)
- Methylene chloride (2014)
- nPB (2016)
- DMF (2016)
- Hydrogen Fluoride (2016)
- Cyanide Compounds (2016)
- Toluene diisocyanate (2017)

TURA Lower Hazard Substances

- Isobutyl alcohol, 2009
- Sec butyl alcohol, 2009
- N butyl alcohol, 2009
- Ferric chloride, 2010
- Ferrous chloride, 2010
- Ferric sulfate, 2010
- Ferrous sulfate, 2010
- Ferrous sulfate heptahydrate, 2010
- Butyl acetate, 2010
- Iso butyl acetate, 2010

TURA Higher Hazard Substances-data

Chemical	Oral LD50 mg/kg	Reference Dose (RfD) mg/kg-day	IARC	ACGIH TLV	BCF	logKow	Flash Point (°F)
Trichloroethylene	2402	0.0005	1	10 ppm	22.5	2.49	54
Perchloroethylene	3835	0.006	2A	25 ppm	124	3.27	113
Methylene Chloride	1600	0.006	2A	50 ppm	38.4	1.25	103
N propyl bromide			2B	0.1 ppm	7.23	2.1	77.9
Formaldehyde	42	0.2	1	0.1 ppm	1.74	0.35	150
Hydrogen Fluoride	143	.04		0.5 ppm			
Cadmium & Compounds	225	0.0005	1	0.01 mg/m ³	52900		
Toluene Diisocyanates & Isomers	1950		2B	.001 ppm	295	3.4	266
Dimethylformamide	2800	1	2A	5 ppm	0.82	-0.9	139

Housekeeping - New chems reported

- Acetyl chloride
- Sodium phosphate
- Triethanolamine dodecylbenzene sulfonate
- Ammoniumsulfite
- Dipropylamine
- Monomethylamine
- 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta[G]-2-benzopyran
- 1,3-dichloro-2-Propanol
- Nonylphenols
- Nonylphenol ethoxylates
- DINP

NMP

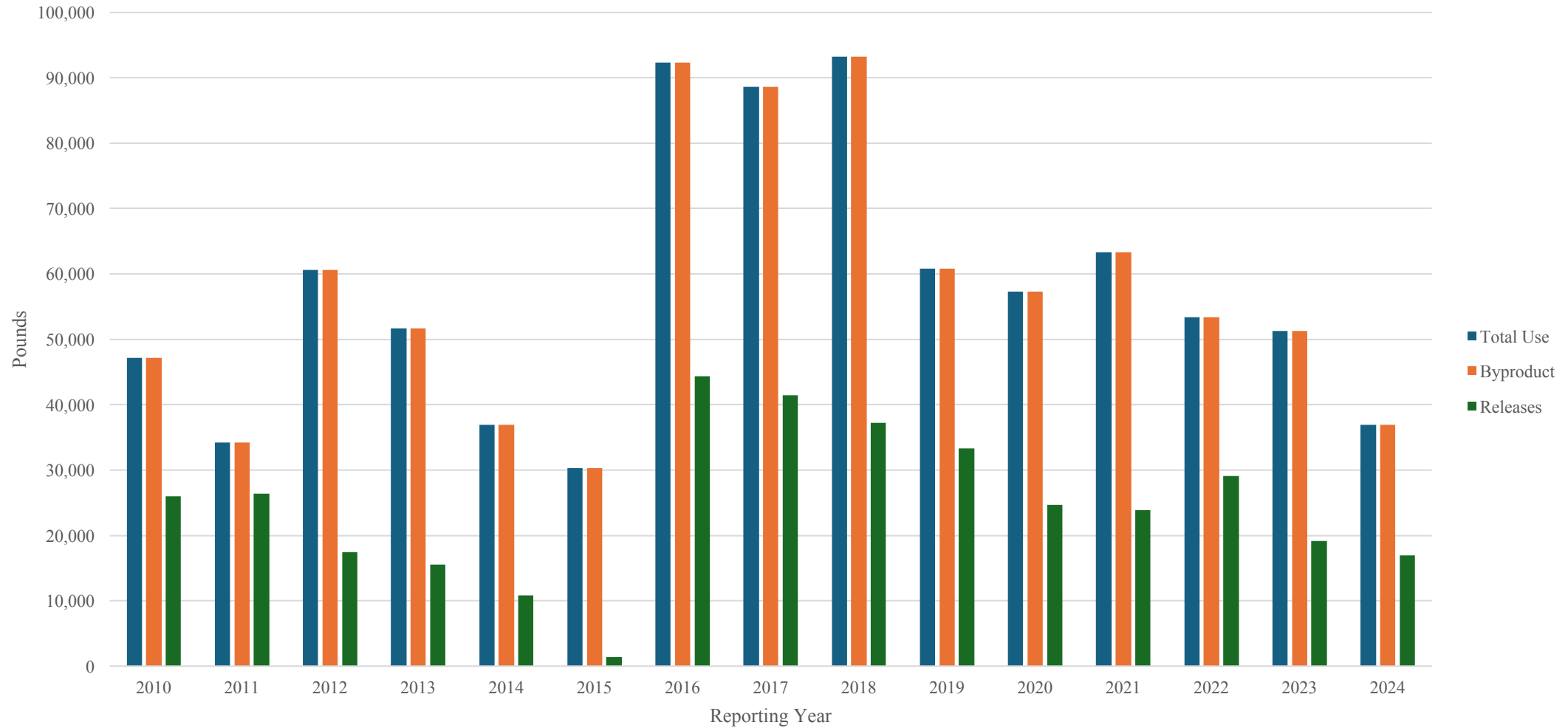
Chemical	Oral LD50 mg/kg	Reference Dose (RfD) mg/kg-day	IARC	ACGIH TLV	BCF	logKow	Flash Point (°F)
N Methyl Pyrrolidone (NMP)	3914			BEI 100 mg/L	1.4	-0.437	204

After the SAB

- TURI consults with SAB on HHS recommendations
- SAB decisions are made on inherent hazard of a substance, not on risk/exposure
- TURA program determines policy implications (users/alternatives/etc) and potential impact

An example-NPB

Total Use, Byproduct and Releases of NPB Reported under TURA



Questions for today

- How would you prioritize selecting Higher Hazard Substances?
- Are there any data points that are not useful?
- Are there any key endpoints missing?