



Minnesota Toxic Free Kids Program - 2022

CHEMICALS OF HIGH CONCERN LIST UPDATE



Minnesota Toxic Free Kids Program – 2022 Update

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Abbreviations and Acronyms

Abbreviations and Acronyms	Phrase or Organization Name
CAS RN	Chemical Abstract Service Registry Number
CDR	Chemical Data Reporting; United States Environmental Protection Agency
CEC	Contaminants of Emerging Concern; Minnesota Department of Health
CHC	Chemicals of High Concern List
Commerce	Minnesota Department of Commerce
CPIT	Chemicals in Products Interagency Team
ECHA	European Chemicals Agency
EPA	United States Environmental Protection Agency
HPV	High Production Volume
IARC	International Agency for Research on Cancer
IC2	Interstate Chemicals Clearinghouse
MDH	Minnesota Department of Health
MPCA	Minnesota Pollution Control Agency
ORD	Office of Research and Development; United States Environmental Protection Agency
OR HPCCH	Oregon Health Authority High Priority Chemicals of Concern for Children’s Health
PBT	Persistent, Bioaccumulative, and Toxic
PC	Priority Chemical List
SVHC	Substances of Very High Concern List; European Chemicals Agency
TEST	Toxicity Estimation Software Tool; United States Environmental Protection Agency
TFK	Toxic Free Kids
TSCA	Toxic Substance Control Act
vPvB	Very Persistent and Very Bioaccumulative

MN TOXIC FREE KIDS PROGRAM – 2022 UPDATE REPORT

Abbreviations and Acronyms	Phrase or Organization Name
WA CHCC	Washington Department of Ecology Chemicals of High Concern to Children

Executive Summary

Through the Toxic Free Kids (TFK) program, the Minnesota Department of Health (MDH) is working to identify and communicate the potential for hazardous chemical exposures from consumer products that could be harmful to human health, particularly to vulnerable or susceptible populations such as children.

The TFK program began in 2009 after Minnesota passed legislation (Minnesota Statutes, sections 116.9401 to 116.9407) known as the Toxic Free Kids Act (Minnesota Statutes, 2021). The legislation directed MDH to create a Chemicals of High Concern (CHC) list and a Priority Chemicals (PC) list. These lists focused on hazardous chemicals that could be found in consumer products with particular concern for hazardous chemicals found in children's products. The first few years of the TFK program focused on creating and maintaining these two lists.

From 2016 to 2020, the TFK program increased its work on communication and education efforts not only with the public, but also with the business, government, and academic communities. While the statutory responsibility of maintaining the two chemical lists is still an important function of the TFK program, MDH recognized that more could be done to work with the communities and populations impacted by and concerned with hazardous chemicals in consumer products. The TFK program update report in 2019 (Minnesota Department of Health, 2019) provides information on these expanded partnerships and outreach efforts.

This report provides an update to both the 2022 CHC list (required every three years) and to the areas of partnership and outreach that the TFK program has been involved in over the past three years.

The CHC list is a hazard-based chemical list, as defined by the TFK statute, where MDH identifies chemicals that could be harmful to human or environmental health because they are known or suspected:

- carcinogens
- reproductive or developmental toxicants
- systemic toxicants
- endocrine disruptors
- persistent, bioaccumulative, and toxic (PBT) chemicals
- or are very persistent and very bioaccumulative (vPvB) chemicals (Minnesota Statutes, 2021).

The original CHC list was published in 2010 and MDH reviews the list every three years. This report describes the fourth review and update of the CHC list.

Updates to the CHC list since 2010 have included reviews of PBT chemical status, high production volume (HPV) chemical status, as well as the addition and removal of chemicals. Chemicals were added to or removed from the 2022 CHC list after reviewing statutorily named authoritative sources and after reviewing any relevant toxicological studies. The 2022 review also looked for statutorily exempted chemical uses when considering a chemical's removal from the CHC list. The United States Environmental Protection Agency's (EPA) Chemical Data Reporting (CDR) rule submissions were analyzed while reviewing the HPV status of chemicals on the 2022 CHC list (U.S. Environmental Protection Agency, 2022b). The 2022 CHC list contains 1,744 chemicals and this review added 29 chemicals (Appendix A), removed 31 chemicals (Appendix B), and updated the HPV status of 475 chemicals on the CHC list.

Since the last update report in 2019, the TFK program has maintained key partnerships and added another. Since the Toxic Free Kids Act was passed in 2009, MDH has been a member of the Interstate Chemicals Clearinghouse (IC2), a national association of state, local, and tribal governments that promotes a clean environment, healthy communities, and a vital economy through the development and use of safer chemicals and products. In 2016 MDH helped establish the Chemicals in Products Interagency Team (CPIT) that works with other Minnesota State agencies to align work efforts relating to chemicals in consumer and commercial products, with a special focus on children's products. The most recent partnership for the TFK program is with the EPA's Office of Research and Development (ORD). Through this partnership, ORD has lent their expertise and data analysis capabilities to produce an automated tool that will help the TFK program assess potential chemicals from the CHC list for addition to the Priority Chemicals list. Developing such a tool has been a goal of the TFK program for many years, and the program is excited to be in a testing phase before beginning to apply the tool later this year.

Unfortunately, over the past three years the TFK program was not able to be as active in community outreach and education efforts as it had previously. The reason for this was the COVID-19 pandemic. Not only were many in-person events unable to happen, but TFK program staff were called upon by MDH to work full-time in the state's COVID-19 emergency response efforts. This reduction in staff resulted in a maintenance level of TFK program responsibilities and paused much of the program's outreach and education efforts. The TFK program plans to have more dedicated resources and staffing back by the end of 2022, and despite this necessary pause on some TFK program activities, the program's work over the past handful of years has established a strong base from which to build upon. The program anticipates a return to past education and outreach efforts in the near future with plans to re-engage and expand the partnerships and collaborations of the TFK program.

The updated 2022 CHC list, education and outreach materials, and this report are published on the MDH website at: [Toxic Free Kids: Chemicals of High Concern and Priority Chemicals \(www.health.state.mn.us/communities/environment/childenvhealth/tfka\)](https://www.health.state.mn.us/communities/environment/childenvhealth/tfka). Future materials, updates, and revisions will also be published on the MDH website. To receive notifications of MDH activity related to the TFK program, sign up for e-mail notices at the above web link.

2022 Chemicals of High Concern Update

This section of the report describes the 2022 update to the Chemicals of High Concern (CHC) list. Later sections describe Toxic Free Kids (TFK) program updates since 2019, focusing on partnership collaborations and status updates on the education/outreach work of the program.

Legislative Background

In 2009, Minnesota passed legislation related to concerns of hazardous chemicals being present in consumer products, especially products intended for children. This legislation, known as the Minnesota Toxic Free Kids Act, requires the Minnesota Department of Health (MDH), in consultation with the Minnesota Pollution Control Agency (MPCA), to create and maintain two chemical lists (Minnesota Statutes, 2021). The first list, called the Chemicals of High Concern (CHC), is a chemical hazard-based list defined in Minnesota Statutes, section 116.9401, paragraph (e):

(e) “Chemical of high concern” means a chemical identified on the basis of credible scientific evidence by a state, federal, or international agency as being known or suspected with a high degree of probability to:

- (1) harm the normal development of a fetus or child or cause other developmental toxicity;
- (2) cause cancer, genetic damage, or reproductive harm;
- (3) disrupt the endocrine or hormone system;
- (4) damage the nervous system, immune system, or organs, or cause other systemic toxicity;
- (5) be persistent, bioaccumulative, and toxic; or
- (6) very persistent, and very bioaccumulative.

The statute establishes a schedule for updating the CHC list, and names potential sources to be used when evaluating chemicals for possible inclusion on the CHC list in Minnesota Statutes, section 116.9402, paragraphs (b) through (d):

(b) The department must periodically review and revise the list of chemicals of high concern at least every three years. The department may add chemicals to the list if the chemical meets one or more of the criteria in section 116.9401, paragraph (e).

(c) The department shall consider chemicals listed as a suspected carcinogen, reproductive or developmental toxicant, or as being persistent, bioaccumulative, and toxic, or very persistent and very bioaccumulative by a state, federal, or international agency. These agencies may include but are not limited to, the California Environmental Protection Agency, the Washington Department of Ecology, the United States Department of Health, the United States Environmental Protection Agency, the United

Nation’s World Health Organization, and European Parliament Annex XIV concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals.

(d) The department may consider chemicals listed by another state as harmful to human health or the environment for possible inclusion in the list of chemicals of high concern.

MDH published the first CHC list in July of 2010; that list and subsequent updates can be found on MDH’s website at: [Toxic Free Kids Act, Chemicals of High Concern and Priority Chemicals www.health.state.mn.us/communities/environment/childenvhealth/tfka](http://www.health.state.mn.us/communities/environment/childenvhealth/tfka).

Previous Chemicals of High Concern Lists

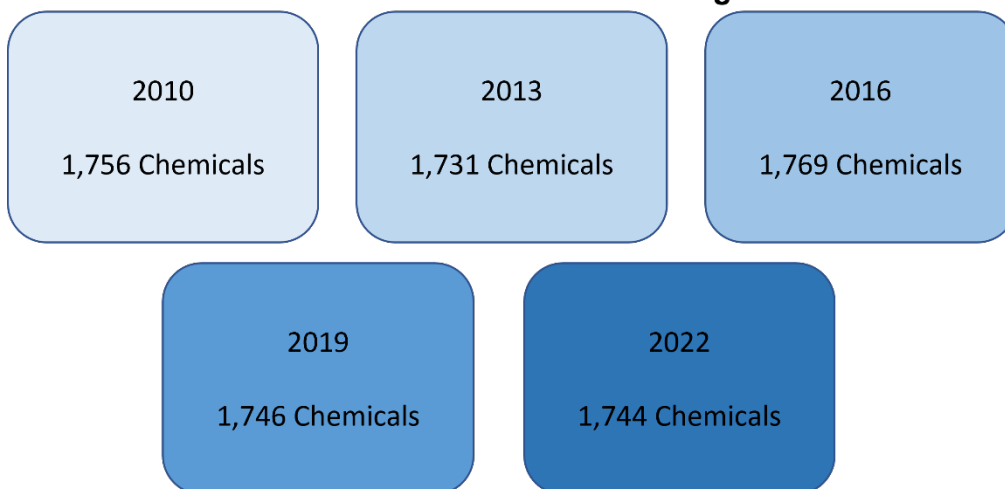
Minnesota’s CHC list was created in 2010 and is updated every three years. Previous updates to the CHC list reviewed persistent, bioaccumulative, and toxic (PBT) properties of chemicals listed; the high production volume (HPV) status of chemicals listed; and reviewed authoritative sources and chemical data for additions to and removals from the CHC list. For detailed information on the previous CHC list updates, visit the MDH website: [Toxic Free Kids Act, Reports www.health.state.mn.us/communities/environment/childenvhealth/tfka/reports](http://www.health.state.mn.us/communities/environment/childenvhealth/tfka/reports) (Minnesota Department of Health, 2013, 2016, 2019).

Chemicals Added and Removed

The 2022 CHC list update reviewed chemicals for addition to the list. As with previous updates to the CHC list, MDH reviewed new toxicological literature and updates to authoritative state, national, and international chemical lists, particularly those authoritative sources named in Minnesota Statutes, section 116.9402.

When reviewing chemicals for potential addition to the CHC list, MDH looked for likely chemicals identified by authoritative sources since the previous CHC list update in 2019. Next, a rapid review of the 2019 list searching for statutorily exempted chemical use categories was performed. This process is done similarly with each cycle of CHC list review and resulted in 29 chemicals added to and 31 chemicals removed from the 2022 CHC list. The 2022 CHC list contains 1,744 chemicals.

Number of Chemicals on the Chemicals of High Concern List



MDH's review of the following authoritative lists resulted in chemicals being added to the 2022 CHC list:

- International Agency for Research on Cancer (IARC) Monographs (World Health Organization, 2022)
- Oregon State High Priority Chemicals of Concern for Children's Health (Oregon Health Authority, 2022)
- Registration, Evaluation, Authorisation, and Restriction of Chemicals, Substances of Very High Concern (SVHC) (European Chemicals Agency, 2022)
- Washington State Chemicals of High Concern to Children (Washington Department of Ecology, 2022)

MDH reviewed chemicals newly listed since 2019 by IARC and on the European Chemicals Agency's (ECHA) SVHC list and compared these chemicals to the 2019 CHC list. Chemicals found on those source lists, but not found on the 2019 CHC list were then further reviewed to identify commercial or consumer uses/applications. Minnesota Statutes, section 116.9405, names specific use/applications that are exempt from being listed (Minnesota Statutes, 2021). If a chemical was exclusively used in an exempted category or if no known uses could be determined, it was not added to the 2022 CHC list. The high concern lists of Oregon and Washington State are not as extensive as the other two sources and so the program compared their lists in entirety to the 2019 CHC list. The review of these two lists then followed the same process of identifying product uses/potential exemptions. This process resulted in 29 chemicals added to the 2022 CHC list. A detailed table of the chemicals added to the 2022 CHC list including their name, chemical abstract registry number (CAS RN), authoritative source, and health endpoint(s) reason for listing is in Appendix A.

Each previous update has included a rapid review of chemicals on the CHC list to determine if any chemicals should be removed. This review focused on searching the CHC list for exempt use/application categories as named in Minnesota Statute 116.9405. The 2022 CHC list update removed 31 chemicals from the list. These 31 removals were listed on the 2019 CHC list as various forms of tail gases. Tail gases are released during industrial/manufacturing processes and do not appear to be found in finished products. Chemicals used in manufacturing processes, but not found in final products are an exempted use so these thirty-one were removed from the 2022 CHC list. These chemicals removed due to a use exemption were done so for this reason only and were not reviewed for their hazardous properties. Removal from the 2022 CHC list should not be interpreted as a determination of safety. A detailed table of the chemicals removed from the 2022 CHC list including their name, CAS RN, and reason for removal is in Appendix B.

High Production Volume Chemicals

A requirement in Minnesota's statutory definition for a chemical listed on the Priority Chemical (PC) list, the list that builds off the CHC list, is that the chemical be a high production volume (HPV) chemical as defined by the United States Environmental Protection Agency (EPA) (Minnesota Statutes, 2021). The EPA High Production Volume Challenge Program defined an HPV chemical as a chemical that is manufactured in or imported into the United States in quantities of one million pounds or more per year (U.S. Environmental Protection Agency,

2022a). Because the HPV status of a chemical on the CHC list affects the eligibility of a chemical for the PC list, HPV chemical status is reviewed and noted on the CHC list.

Under the U.S. Toxic Substances Control Act (TSCA), manufacturers or importers of a chemical in the quantity of 25,000 pounds or more per year must report to the EPA under the Chemical Data Reporting (CDR) Rule (U.S. Environmental Protection Agency, 2022b). Each EPA CDR Rule submission year results in thousands of chemicals reporting national production volumes of one million pounds or more. For the CHC list, MDH focuses on chemicals that are consistently being reported with national production volumes of one million pounds or more in at least four of the six most recent data years of EPA CDR submissions (as opposed to only those chemicals reporting one million pounds or more on the most recent data year). This approach of classifying HPV chemicals for the CHC list is a proxy measurement of sustained U.S. population exposure potential. In other words, MDH is classifying CHC chemicals as HPV that have known high levels of chemical production and commercial/consumer product circulation over an extended number of recent years.

For the 2022 CHC list update, MDH reviewed CDR submittal data from the two most recent data submission years, which included data for the years 2012 through 2019. To be considered an HPV chemical on the CHC list a chemical needed to have reported one million pounds or more of national production volume in at least four of the six most recent data years (2014 through 2019 for the 2022 CHC list). This criterion was applied to all 2022 CHC list chemicals, including those newly added to the CHC list in 2022, resulting in 475 HPV chemicals on the 2022 CHC list. The previous 2019 CHC list had 429 HPV chemicals.

The updated 2022 CHC list, tables showing chemicals added or removed, and tables showing the HPV status of the 2022 CHC list chemicals are located on the TFK program website at: [Chemicals of High Concern](https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/highconcern)

[https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/highconcern.](https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/highconcern)

Toxic Free Kids Program Update

The Toxic Free Kids (TFK) program focuses on the health of children as well as Minnesotans who may be at greater risk from hazardous chemical exposures in consumer products. The TFK program works to identify and communicate the potential for hazardous chemical exposures from consumer product uses that could be harmful to human health, particularly to vulnerable or susceptible populations. This section of the report highlights some of the partnership and collaborations that the TFK program has been a part of since the last update in 2019 and provides a status update on education and outreach efforts.

Unfortunately, over the past three years the TFK program was not able to be as active in community outreach and education efforts as previously. The reason for this was the COVID-19 pandemic. Not only were many in-person events unable to happen, but TFK program staff were called upon by MDH to work full-time in the state's COVID-19 emergency response efforts. This resulted in a maintenance level of TFK program responsibilities and paused much of the program's outreach and education efforts. The TFK program plans to have dedicated resources and staffing back by the end of 2022 and will begin to re-engage and expand upon many past projects and collaborations.

Partnerships and Collaborations

United States Environmental Protection Agency

Over the past couple of years MDH’s Contaminants of Emerging Concern (CEC) and TFK programs have worked in a collaborative partnership with the EPA’s Office of Research and Development (ORD). Through this partnership, both the CEC and TFK programs have benefited from the expertise and data analysis capabilities of ORD. The scientists and researchers at ORD have been exceptionally helpful to both MDH programs and the ability to leverage EPA resources to broaden the capabilities of the TFK program further enables the TFK program to better serve the citizens of Minnesota.

The TFK program has been working with ORD to create a rapid evaluation process that will aid TFK staff in designating chemicals to the Priority Chemicals list. Developing such a screening process has been a goal of the TFK program for many years and this partnership with ORD has allowed the program to reach this goal. After creating hazard and exposure data workflows with ORD, they have modified their existing Toxicity Estimation Software Tool (TEST; Vegosen, 2020) to allow the TFK program to rapidly evaluate a range of chemicals for potential hazards and exposures. This modified version of TEST was done to align the tool’s analysis with Minnesota statutory requirements for a Priority Chemical in the TFK program (Minnesota Statutes, 2021). This tool will likely be used to screen HPV chemicals on the CHC list and help identify chemicals for detailed review and consideration for listing as a Priority Chemical in the future.

The tool is currently in its testing phase at MDH. The goal is to have the tool ready for use by Fall 2022 and to then incorporate it into a new Priority Chemical screening process by the end of 2022. To stay updated on the rollout of this new TFK tool, check the TFK announcements webpage at:

<https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/announcements.html> or sign-up for Toxic Free Kids email updates at: https://public.govdelivery.com/accounts/MNMDH/subscriber/new?topic_id=MNMDH_178.

Chemicals in Products Interagency Team

In 2016, MDH, the MPCA, and the Minnesota Department of Commerce (Commerce) formally established the Chemicals in Products Interagency Team (CPIT). From article II of the CPIT charter, the goal of CPIT is:

“To reduce the amount of chemical hazards in products, their dispersion into Minnesota’s environment, and their presence in the bodies of Minnesota citizens, especially our most vulnerable communities” (Chemicals in Products Interagency Team, 2016).

The three agencies work in partnership to:

- Monitor chemical hazards in consumer and business-to-business products, humans, and the environment;
- Educate citizens, vulnerable communities, and businesses about chemical hazards and how to avoid them if they so choose; and to

- Accelerate the development and use of safer alternatives by businesses, state government, and citizens, enhancing Minnesota business growth wherever possible.

Through CPIT, MDH and the other member agencies have been able to align their work efforts and leverage their respective authorities and resources on the many issues and projects relating to chemicals in consumer and commercial products. CPIT creates a formal process for sharing information and working across agencies on these related topics and projects with limited resources.

An example of CPIT collaboration is working on consumer product testing studies. CPIT works together to randomly purchase, screen, and test consumer products that must be in compliance with hazardous and toxic chemical and product restriction statutes in Minnesota. Recently, flame retardant restrictions for retailers went into effect on July 1, 2022. CPIT is working to ensure that retailers and companies are aware of these new restrictions and plans to randomly screen some products in the future for compliance checks.

Year	Chemicals	Type of consumer products
2015	Formaldehyde	Personal care products
2017	Formaldehyde	Personal care products
2017	Lead; Cadmium	Children’s jewelry
2018	Lead; Cadmium	Children’s jewelry
2019	Flame Retardants	Furniture
2020	Phthalates	Children’s products
2022	Lead; Cadmium	Children’s jewelry, toys, school supplies
2022-23	Bisphenol A	<i>Planning Stage</i>
2022-23	Flame-retardants	<i>Planning stage</i>
2022-23	Mercury	Skin lightening cream; <i>Planning stage</i>

While it does monitor compliance, CPIT also strives for a positive relationship with manufacturers, distributors, and retailers. If a product is not in compliance, CPIT encourages companies to work with their supply chain to find a solution that addresses both business and public health needs.

Examples of CPIT working to promote and accelerate the development and use of safer chemical alternatives is through presentations at speaker and lecture events as well as through the MPCA’s Green Chemistry and Engineering Summer Internship grant projects. More information on the grants can be found on the MPCA website at:

<https://www.pca.state.mn.us/waste/green-and-safer-product-chemistry-grants>.

Interstate Chemicals Clearinghouse (IC2)

The Interstate Chemicals Clearinghouse (IC2) is an association of state, local, and tribal governments that promotes a clean environment, healthy communities, and a vital economy through the development and use of safer chemicals and products. The goals of the IC2 are to:

- Avoid duplication and enhance efficiency and effectiveness of agency initiatives on chemicals through collaboration and coordination
- Build governmental capacity to identify and promote safer chemicals and products
- Ensure that agencies, businesses, and the public have ready access to high quality and authoritative chemicals data, information, and assessment methods

Members from the TFK program and CPIT participate in IC2 activities.

Education and Outreach

Community Outreach

The TFK program connects with local communities and provides outreach and educational materials. Past examples of TFK program work include leading annual sessions on chemical safety at the Cottage Grove Safety Camp, a lecture for Early Childhood Family Education classes discussing toxic and hazardous chemicals found in consumer products, lectures at the University of Minnesota on state level toxic chemical legislation and protection efforts, a semester long partnership with Hamline University students to assist with the development of educational materials for the presence of mercury in skin lightening products, and TFK program participation in HmongTown Festival to share information about mercury in skin lightening products. More details on this effort can be found in the 2019 TFK program update (Minnesota Department of Health, 2019)

Unfortunately, the TFK program's ability to continue to engage in community outreach efforts was put on hold starting in early 2020 because of the COVID-19 pandemic. TFK program staff were redirected to work full-time in COVID-19 emergency response efforts for the past couple of years. The program continued maintenance of TFK program responsibilities, but outreach and education initiatives were paused. Currently the program is building up staffing and resources to be full-time by the end of 2022 thus allowing the program to begin re-engaging and expanding upon hazardous chemical education and outreach projects and collaborations.

Informational and Educational Materials

The TFK program makes educational materials readily available and tailored for various audiences: general public, targeted community groups, business, or a combination. Educational materials help businesses within the supply chain identify where they can make change. Education materials for consumers guide them in safer choices and reminds them that their consumer buying power influences the market. Some educational materials are developed for both businesses and consumer audiences, such as the results from CPIT's chemical assessment studies that randomly purchase, screen, and test consumer products that must be in compliance with hazardous and toxic chemical product restriction statutes in Minnesota. Providing this range of educational materials is an important and necessary way to ensure that

messages are heard by many different stakeholders impacted by potential exposures to toxic and hazardous chemicals as well as those impacted by state chemical legislation. The TFK program posts its educational material on the MDH website at: [Education](https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/education)
<https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/education>.

It is important to provide a range of materials that are accessible through a range of platforms. Along with providing targeted outreach for specific events and providing materials on the program’s website, the TFK program plans to relaunch the digital newsletter with quarterly updates in early 2023, as it did prior to 2020 when COVID-19 diverted TFK staff resources. The TFK program will also be working to get messaging back up on social media platforms, such as Facebook, LinkedIn, and Instagram. Once staffing and resources return to full-time, regular announcements related to children’s environmental health will be posted on the program’s webpage ([Announcements](https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/announcements.html)
<https://www.health.state.mn.us/communities/environment/childenvhealth/tfka/announcements.html>) or [sign-up for Toxic Free Kids email updates to learn when new announcements are made](https://public.govdelivery.com/accounts/MNMDH/subscriber/new?topic_id=MNMDH_178)
(https://public.govdelivery.com/accounts/MNMDH/subscriber/new?topic_id=MNMDH_178).

Summary

The 2022 update of Minnesota’s CHC list resulted in both additions to and removals from the list as well as a review of the HPV chemical status of CHC listed chemicals. This list update added 29 chemicals and removed 31 chemicals, changing the overall size of the CHC list from 1,746 chemicals in 2019 to 1,744 in 2022. The 2022 CHC list will also go from having 429 HPV chemicals to 475 HPV chemicals in 2022.

Despite the setbacks caused by the COVID-19 pandemic, the TFK program continued to maintain base responsibilities and was able to continue to engage in several key partnerships. Active participation and membership in the Minnesota state agency level CPIT workgroup allows for state level collaboration and coordination related to hazardous chemicals and consumer products. Participation in IC2 connects the TFK program to the national landscape of hazardous chemicals and consumer products. New work with EPA’s ORD promises to streamline TFK programmatic processes and provide more transparency in decisions around Priority Chemicals.

The work done in the past years has established a strong base from which to build staffing and resources, and the program anticipates a return to past education and outreach efforts in the near future. The TFK program is proud to use its resources to serve the citizens of Minnesota by researching and providing clear communication about the potential harms of hazardous chemical use in consumer products.

Expanding the TFK program’s role in partnerships and community events has been a major accomplishment of the past few years and is something the program plans to reestablish and grow in the upcoming years. The updated 2022 CHC list, TFK program educational and outreach material, and this report are published on the MDH website and can be found at: [Toxic Free Kids: Chemicals of High Concern and Priority Chemicals](https://www.health.state.mn.us/communities/environment/childenvhealth/tfka)
www.health.state.mn.us/communities/environment/childenvhealth/tfka.

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Appendix A – Chemicals Added

Table 1: Chemicals added to the 2022 Minnesota Chemicals of High Concern List

No.	CAS RN	Chemical Name	Health Endpoint(s)	Authoritative Source(s)	HPV Chemical
1	80-54-6	2-(4-tert-butylbenzyl)propionaldehyde	Reproduction	ECHA SVHC ¹	x
2	88-73-3	2-Chloronitrobenzene	Cancer	IARC ² 2B	
3	89-61-2	1,4-Dichloro-2-nitrobenzene	Cancer	IARC ² 2B	
4	95-85-2	2-Amino-4-chlorophenol	Cancer	IARC ² 2B	
5	98-56-6	4-Chlorobenzotrifluoride	Cancer	IARC ² 2B	x
6	100-17-4	para-Nitroanisole	Cancer	IARC ² 2B	
7	106-91-2	Glycidyl methacrylate	Cancer	IARC ² 2A	x
8	111-30-8	Glutaral	Respiratory sensitizing	ECHA SVHC ¹	x
9	117-84-0	Di-n-octyl phthalate (DnOP)	Liver, kidney, thyroid, and immune system effects	WA CHCC ⁴ & OR HPCCCH ³	
10	143-24-8	Bis(2-(2-methoxyethoxy)ethyl)ether	Reproduction	ECHA SVHC ¹	
11	611-06-3	2,4-Dichloro-1-nitrobenzene	Cancer	IARC ² 2B	
12	615-28-1	ortho-Phenylenediamine dihydrochloride	Cancer	IARC ² 2B	
13	1067-53-4	tris(2-methoxyethoxy)vinylsilane	Reproduction	ECHA SVHC ¹	
14	1072-63-5	1-Vinylimidazole	Reproduction	ECHA SVHC ¹	
15	1333-73-9	Boric acid, sodium salt	Reproduction	ECHA SVHC ¹	
16	3648-18-8	Diocyltin dilaurate	Reproduction	ECHA SVHC ¹	

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No.	CAS RN	Chemical Name	Health Endpoint(s)	Authoritative Source(s)	HPV Chemical
17	4170-30-3	Crotonaldehyde	Cancer	IARC ² 2B	
18	22673-19-4	Dibutylbis(pentane-2,4-dionato-O,O')tin	Reproduction	ECHA SVHC ¹	
19	25628-08-4	N,N,N-Triethylethanaminium 1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulfonate	Developmental, Systemic	ECHA SVHC ¹	
20	29420-49-3	Potassium 1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonate	Developmental, Systemic	ECHA SVHC ¹	
21	36483-57-5	2,2-Dimethylpropan-1-ol, tribromo derivative (TBNPA)	Cancer	ECHA SVHC ¹	
22	62037-80-3	Ammonium 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propanoate	Developmental, Systemic	ECHA SVHC ¹	
23	71868-10-5	2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	Reproduction	ECHA SVHC ¹	
24	119313-12-1	2-Benzyl-2-dimethylamino-4'-morpholinobutyrophenone	Reproduction	ECHA SVHC ¹	
25	121158-58-5	Phenol, dodecyl-, branched	Reproduction, Endocrine system	ECHA SVHC ¹	
26	220689-12-3	Tetrabutyl-phosphonium nonafluorobutane-1-sulfonate	Developmental, Systemic	ECHA SVHC ¹	
27	255881-94-8	S-(tricyclo(5.2.1.0' ² ,6)deca-3-en-8(or 9)-yl O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate	PBT	ECHA SVHC ¹	
28	1372804-76-6	Alkanes, C14-16, chloro	PBT	ECHA SVHC ¹	

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No.	CAS RN	Chemical Name	Health Endpoint(s)	Authoritative Source(s)	HPV Chemical
29	1782069-81-1	(3E)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one	Endocrine system	ECHA SVHC ¹	

Notes

1 – European Chemicals Agency – Substances of Very High Concern (ECHA SVHC)

2 – International Agency for Research on Cancer (IARC)

3 – Oregon Health Authority – High Priority Chemicals of Concern for Children’s Health (OR HPCCH)

4 – Washington Department of Ecology – Chemicals of High Concern to Children (WA CHCC)

Appendix B - Chemicals Removed

Table 2: Chemicals Removed from the 2022 Minnesota Chemicals of High Concern List

No.	CAS RN	Chemical Name	Use Exemption
1	68307-98-2	Tail gas (petroleum), catalytic cracked distillate and catalytic cracked naphtha fractionation absorber; Petroleum gas; [The complex combination of hydrocarbons from the distillation of the products from catalytic cracked distillates and catalytic cracked naphtha. It consists predominantly of hydrocarbons having carbon numbers in the range of C1 through C4.]	MnFct
2	68307-99-3	Tail gas (petroleum), catalytic polymn. naphtha fractionation stabilizer; Petroleum gas; [A complex combination of hydrocarbons from the fractionation stabilization products from polymerization of naphtha. It consists predominantly of hydrocarbons having carbon numbers in the range of C1 through C4.]	MnFct
3	68308-00-9	Tail gas (petroleum), catalytic reformed naphtha fractionation stabilizer, hydrogen sulfide-free; Petroleum gas; [A complex combination of hydrocarbons obtained from fractionation stabilization of catalytic reformed naphtha and from which hydrogen sulfide has been removed by amine treatment. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	MnFct
4	68308-01-0	Tail gas (petroleum), cracked distillate hydrotreater stripper; Petroleum gas; [A complex combination of hydrocarbons obtained by treating thermal cracked distillates with hydrogen in the presence of a catalyst. It consists predominantly of saturated hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
5	68308-03-2	Tail gas (petroleum), gas oil catalytic cracking absorber; Petroleum gas; [A complex combination of hydrocarbons obtained from the distillation of products from the catalytic cracking of gas oil. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct

No.	CAS RN	Chemical Name	Use Exemption
6	68308-04-3	Tail gas (petroleum), gas recovery plant; Petroleum gas; [A complex combination of hydrocarbons from the distillation of products from miscellaneous hydrocarbon streams. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct
7	68308-05-4	Tail gas (petroleum), gas recovery plant deethanizer; Petroleum gas; [A complex combination of hydrocarbons from the distillation of products from miscellaneous hydrocarbon streams. It consists of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	MnFct
8	68308-06-5	Tail gas (petroleum), hydrodesulfurized distillate and hydrodesulfurized naphtha fractionator, acid-free; Petroleum gas; [A complex combination of hydrocarbons obtained from fractionation of hydrodesulfurized naphtha and distillate hydrocarbon streams and treated to remove acidic impurities. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct
9	68308-07-6	Tail gas (petroleum), hydrodesulfurized vacuum gas oil stripper, hydrogen sulfide-free; Petroleum gas; [A complex combination of hydrocarbons obtained from stripping stabilization of catalytic hydrodesulfurized vacuum gas oil and from which hydrogen sulfide has been removed by amine treatment. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
10	68308-08-7	Tail gas (petroleum), isomerized naphtha fractionation stabilizer; Petroleum gas; [A complex combination of hydrocarbons obtained from the fractionation stabilization products from isomerized naphtha. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	MnFct
11	68308-09-8	Tail gas (petroleum), light straight-run naphtha stabilizer, hydrogen sulfide-free; Petroleum gas; [A complex combination of hydrocarbons obtained from fractionation stabilization of light straight run naphtha	MnFct

No.	CAS RN	Chemical Name	Use Exemption
		and from which hydrogen sulfide has been removed by amine treatment. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	
12	68308-10-1	Tail gas (petroleum), straight-run distillate hydrodesulfurizer, hydrogen sulfide-free; Petroleum gas; [A complex combination of hydrocarbons obtained from catalytic hydrodesulfurization of straight run distillates and from which hydrogen sulfide has been removed by amine treatment. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	MnFct
13	68308-11-2	Tail gas (petroleum), propane-propylene alkylation feed prep deethanizer; Petroleum gas; [A complex combination of hydrocarbons obtained from the distillation of the reaction products of propane with propylene. It consists of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	MnFct
14	68308-12-3	Tail gas (petroleum), vacuum gas oil hydrodesulfurizer, hydrogen sulfide-free; Petroleum gas; [A complex combination of hydrocarbons obtained from catalytic hydrodesulfurization of vacuum gas oil and from which hydrogen sulfide has been removed by amine treatment. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
15	68478-21-7	Tail gas (petroleum), catalytic cracked clarified oil and thermal cracked vacuum residue fractionation reflux drum; Petroleum gas; [A complex combination of hydrocarbons obtained from fractionation of catalytic cracked clarified oil and thermal cracked vacuum residue. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
16	68478-22-8	Tail gas (petroleum), catalytic cracked naphtha stabilization absorber; Petroleum gas; [A complex combination of hydrocarbons obtained from the	MnFct

No.	CAS RN	Chemical Name	Use Exemption
		stabilization of catalytic cracked naphtha. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	
17	68478-24-0	Tail gas (petroleum), catalytic cracker, catalytic reformer and hydrodesulfurizer combined fractionater; Petroleum gas; [A complex combination of hydrocarbons obtained from the fractionation of products from catalytic cracking, catalytic reforming and hydrodesulfurizing processes treated to remove acidic impurities. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct
18	68478-25-1	Tail gas (petroleum), catalytic cracker refractionation absorber; Refinery gas; [A complex combination of hydrocarbons obtained from refractionation of products from a catalytic cracking process. It consists of hydrogen and hydrocarbons having carbon numbers predominantly in the range of C1 through C3.]	MnFct
19	68478-26-2	Tail gas (petroleum), catalytic reformed naphtha fractionation stabilizer; Petroleum gas; [A complex combination of hydrocarbons obtained from the fractionation stabilization of catalytic reformed naphtha. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	MnFct
20	68478-27-3	Tail gas (petroleum), catalytic reformed naphtha separator; Refinery gas; [A complex combination of hydrocarbons obtained from the catalytic reforming of straight run naphtha. It consists of hydrogen and hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
21	68478-28-4	Tail gas (petroleum), catalytic reformed naphtha stabilizer; Refinery gas; [A complex combination of hydrocarbons obtained from the stabilization of catalytic reformed naphtha. It consists of hydrogen and hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct

No.	CAS RN	Chemical Name	Use Exemption
22	68478-29-5	Tail gas (petroleum), cracked distillate hydrotreater separator; Refinery gas; [A complex combination of hydrocarbons obtained by treating cracked distillates with hydrogen in the presence of a catalyst. It consists of hydrogen and saturated aliphatic hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct
23	68478-30-8	Tail gas (petroleum), hydrodesulfurized straight-run naphtha separator; Refinery gas; [A complex combination of hydrocarbons obtained from hydrodesulfurization of straight-run naphtha. It consists of hydrogen and saturated aliphatic hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
24	68478-32-0	Tail gas (petroleum), saturate gas plant mixed stream, C4-rich; Petroleum gas; [A complex combination of hydrocarbons obtained from the fractionation stabilization of straight-run naphtha, distillation tail gas and catalytic reformed naphtha stabilizer tail gas. It consists of hydrocarbons having carbon numbers in the range of C3 through C6, predominantly butane and isobutane.]	MnFct
25	68478-33-1	Tail gas (petroleum), saturate gas recovery plant, C1-2-rich; Petroleum gas; [A complex combination of hydrocarbons obtained from fractionation of distillate tail gas, straight-run naphtha, catalytic reformed naphtha stabilizer tail gas. It consists predominantly of hydrocarbons having carbon numbers in the range of C1 through C5, predominantly methane and ethane.]	MnFct
26	68478-34-2	Tail gas (petroleum), vacuum residues thermal cracker; Petroleum gas; [A complex combination of hydrocarbons obtained from the thermal cracking of vacuum residues. It consists of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct
27	68952-77-2	Tail gas (petroleum), catalytic cracked distillate and naphtha stabilizer; Petroleum gas; [A complex combination of hydrocarbons obtained by the fractionation of catalytic cracked naphtha and	MnFct

No.	CAS RN	Chemical Name	Use Exemption
		distillate. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C4.]	
28	68952-79-4	Tail gas (petroleum), catalytic hydrodesulfurized naphtha separator; Refinery gas; [A complex combination of hydrocarbons obtained from the hydrodesulfurization of naphtha. It consists of hydrogen, methane, ethane, and propane.]	MnFct
29	68952-80-7	Tail gas (petroleum), straight-run naphtha hydrodesulfurizer; Refinery gas; [A complex combination obtained from the hydrodesulfurization of straight-run naphtha. It consists of hydrogen and hydrocarbons having carbon numbers predominantly in the range of C1 through C5.]	MnFct
30	68952-81-8	Tail gas (petroleum), thermal-cracked distillate, gas oil and naphtha absorber; petroleum gas; [A complex combination of hydrocarbons obtained from the separation of thermal-cracked distillates, naphtha and gas oil. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C1 through C6.]	MnFct
31	68952-82-9	Tail gas (petroleum), thermal cracked hydrocarbon fractionation stabilizer, petroleum coking; Petroleum gas; [A complex combination of hydrocarbons obtained from the fractionation stabilization of thermal cracked hydrocarbons from petroleum coking process. It consists of hydrocarbons having carbon numbers predominantly in the range of C1 through C6.	MnFct

Notes

MnFct = Chemicals used in manufacturing process but are not present in the final product.