

4717.7860 HEALTH RISK LIMITS TABLE.

Subpart 1. **Generally.** This table lists the health risk limits derived from methods specified in parts 4717.7830, 4717.7840, and 4717.7850. For each chemical, this table specifies:

- A. the chemical name;
- B. the CAS number;
- C. the year the HRL was adopted;
- D. the volatility classification;
- E. any noncancer HRL;
- F. any cancer HRL;
- G. the RfD and RSC used in the derivation of any noncancer HRL;
- H. the slope factor and any ADAF or $AF_{lifetime}$ used in the derivation of any cancer HRL;
- I. the intake rate used in the derivation of any noncancer or cancer HRL; and
- J. the health endpoints.

Subp. 2. Explanation of table in this part.

- A. "--" symbol means not relevant.
- B. "NA" means not applicable.
- C. "ND" means not derived due to absence or paucity of toxicity information.
- D. "None" means not applicable for inclusion in the health risk index.
- E. The following explanations in subitems (1) to (3) apply where noted:

(1) The acute HRL value is less than the calculated HRL. To be protective of acute exposures, the HRL is set equal to the acute HRL value.

(2) The short-term HRL value is less than the calculated HRL. To be protective of short-term exposures, the HRL is set equal to the short-term HRL value.

(3) The subchronic HRL value is less than the calculated HRL. To be protective of subchronic exposures, the HRL is set equal to the subchronic HRL value.

Subp. 2a. Acenaphthene.

CAS number: 83-32-9

Year Adopted: 2018

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	200	100	NA
RfD (mg/kg-day)	--	--	0.070	0.021	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.070	0.044	--
Endpoints	--	--	adrenal, hepatic (liver) system	adrenal, hepatic (liver) system	--

Subp. 2b. **Acetaminophen.**

CAS number: 103-90-2

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	200	200	200 (2)	200 (2)	NA
RfD (mg/kg-day)	0.25	0.25	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	--
Endpoints	hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	--

Subp. 3. **Acetochlor.**

CAS number: 34256-82-1

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30	30	20	NA
RfD (mg/kg-day)	--	0.016	0.012	0.0039	--
RSC	--	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	0.070	0.044	--
Endpoints	--	developmental, hepatic (liver) system, thyroid (E)	hepatic (liver) system, male reproductive system, nervous system, renal (kidney) system	hepatic (liver) system, male reproductive system, nervous system, renal (kidney) system, respiratory system	--

Subp. 3a. **Acetochlor ESA.**

CAS number: 187022-11-3

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	500	500	300	NA
RfD (mg/kg-day)	--	0.29	0.19	0.056	--

RSC	--	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	0.070	0.044	--
Endpoints	--	thyroid (E)	male reproductive system, thyroid (E)	male reproductive system, thyroid (E)	--

Subp. 3b. **Acetochlor OXA.**

CAS number: 184992-44-4

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	100 (2)	90	NA
RfD (mg/kg-day)	--	0.081	(2)	0.019	--
RSC	--	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	(2)	0.044	--
Endpoints	--	thyroid (E)	thyroid (E)	thyroid (E)	--

Subp. 3c. **Acetone.**

CAS number: 67-64-1

Year Adopted: 2023

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	5,000	5,000 (2)	3,000	NA
RfD (mg/kg-day)	--	3.1	(2)	0.69	--
RSC	--	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	0.045	--
Endpoints	--	renal (kidney) system	renal (kidney) system	hematological (blood) system, hepatic (liver) system, renal (kidney) system	--

Subp. 3d. **6-Acetyl-1,1,2,4,4,7-hexamethyltetraline (AHTN).**

CAS number: 21145-77-7 or 1506-02-1

Year Adopted: 2013

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	30	20	NA
RfD (mg/kg-day)	--	0.070	0.011	0.0037	--
RSC	--	0.5	0.2	0.2	--

SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289	0.077	0.043	--
Endpoints	--	hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	--

Subp. 3e. **Acrylamide.**

CAS number: 79-06-1

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	7	7 (2)	7 (2)	0.2
RfD (mg/kg-day)	--	0.010	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	0.5
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.289	(2)	(2)	0.137 _(<2) 0.047 _(2 to <16) 0.039 ₍₁₆₊₎
Endpoints	--	developmental, male reproductive system, nervous system	developmental, male reproductive system, nervous system	developmental, male reproductive system, nervous system	cancer

Subp. 4. **Alachlor.**

CAS number: 15972-60-8

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	60	9	NA
RfD (mg/kg-day)	--	0.077	0.020	0.0020	--
RSC	--	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	0.070	0.044	--
Endpoints	--	developmental, renal (kidney) system	hematological (blood) system, hepatic (liver) system, renal (kidney) system	hematological (blood) system, hepatic (liver) system, renal (kidney) system	--

Subp. 4a. **Aminomethylphosphonic acid (AMPA).**

CAS number: 1066-51-9

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	3,000	1,000	--
RfD (mg/kg-day)	--	--	0.96	0.32	--
RSC	--	--	0.2	0.2	--

SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.074	0.045	--
Endpoints	--	--	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 5. **Atrazine.**

CAS number: 1912-24-9

Year Adopted: 2009

Volatility: Nonvolatile

MCL-based HRL: 3 µg/L

Subp. 5a. **Bentazon.**

CAS number: 25057-89-0

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	400	60	50	30	NA
RfD (mg/kg-day)	0.22	0.033	0.020	0.0060	--
RSC	0.5	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	0.289	0.289	0.077	0.043	--
Endpoints	developmental, female reproductive system	developmental	hematological (blood) system	thyroid	--

Subp. 6. **Benzene.**

CAS number: 71-43-2

Year Adopted: 2009

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	10	10	3	3 (3)	2
RfD (mg/kg-day)	0.015	0.014	0.0013	(3)	--
RSC	0.2	0.2	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	0.055
ADAF	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.289	0.289	0.077	(3)	0.137 (_{<2}) 0.047 (_{2 to <16}) 0.039 (₁₆₊)
Endpoints	developmental	hematological (blood) system, immune system	hematological (blood) system, immune system	hematological (blood) system, immune system	cancer

Subp. 6a. [Renumbered subp 6f]

Subp. 6b. [Renumbered subp 6g]

Subp. 6c. **Benzo[a]pyrene.**

CAS number: 50-32-8

Year Adopted: 2023

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.5	0.5 (2)	0.5 (2)	0.1
RfD (mg/kg-day)	--	0.00031	(2)	(2)	--
RSC	--	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	1
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	0.155 (<2) 0.040 (2 to <16) 0.042 (16+)
Endpoints	--	developmental, nervous system	developmental, nervous system	developmental, nervous system	cancer

Subp. 6d. **Benzophenone.**

CAS number: 119-61-9

Year Adopted: 2023

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	900	100	100 (3)	NA
RfD (mg/kg-day)	--	0.52	0.053	(3)	--

RSC	--	0.5	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	0.074	(3)	--
Endpoints	--	developmental	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 6e. **1H-Benzotriazole.**

CAS number: 95-14-7

Year Adopted: 2023

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	20	20 (2)	20 (2)	NA
RfD (mg/kg-day)	--	0.023	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	developmental	developmental	developmental	--

Subp. 6f. **Biphenyl.**

CAS number: 92-52-4

Year Adopted: 2023

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	400	100	100 (2)	100 (2)	10
RfD (mg/kg-day)	0.58	0.18	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	0.008
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.290	0.290	(2)	(2)	0.155 (<2) 0.040 (2 to <16) 0.042 (16+)
Endpoints	renal (kidney) system	renal (kidney) system	renal (kidney) system	renal (kidney) system	cancer

Subp. 6g. **Bisphenol A (BPA).**

CAS number: 80-05-7

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	20	20 (3)	NA
RfD (mg/kg-day)	--	0.16	0.0065	(3)	--
RSC	--	0.2	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	0.289	0.077	(3)	--
Endpoints	--	developmental, female reproductive system (E), hepatic (liver) system, male reproductive system (E), renal (kidney) system, thyroid (E)	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 6h. **Bromodichloromethane.**

CAS number: 75-27-4

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	400	30	30 (2)	30	3
RfD (mg/kg-day)	0.073	0.039	(2)	0.0075	--
RSC	0.2	0.2	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	0.035
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.038	0.290	(2)	0.045	0.155 (<2) 0.040 (2 to <16)

					0.042 ₍₁₆₊₎
Endpoints	female reproductive system (E)	immune system, spleen	immune system, spleen	hepatic (liver) system	cancer

Subp. 6i. **Butyl benzyl phthalate.**

CAS number: 85-68-7

Year Adopted: 2015

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	100	100	100 (2)	100 (2)	NA
RfD (mg/kg-day)	0.15	0.15	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	--
Endpoints	developmental (E)	developmental (E)	developmental (E)	developmental (E)	--

Subp. 6j. **Cadmium.**

CAS number: 7440-43-9

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	5	1	1	0.5	NA
RfD (mg/kg-day)	0.0077	0.0016	0.00044	0.00011	--

RSC	0.2	0.2	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	0.077	0.043	--
Endpoints	developmental	developmental, nervous system, renal (kidney) system	developmental, skeletal	renal (kidney) system, skeletal	--

Subp. 6k. **Carbamazepine.**

CAS number: 298-46-4

Year Adopted: 2013

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	40	40	40 (2)	40 (2)	NA
RfD (mg/kg-day)	0.013	0.013	(2)	(2)	--
RSC	0.8	0.8	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	--
Endpoints	developmental, nervous system	developmental, hematological (blood) system, hepatic (liver) system, immune	developmental, hematological (blood) system, hepatic (liver) system, immune	developmental, hematological (blood) system, hepatic (liver) system, immune	--

		system, nervous system, male reproductive system (E), female reproductive system (E), thyroid (E)	system, nervous system, male reproductive system (E), female reproductive system (E), thyroid (E)	system, nervous system, male reproductive system (E), female reproductive system (E), thyroid (E)	
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Subp. 6l. **Carbon tetrachloride.**

CAS number: 56-23-5

Year Adopted: 2013

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	100	3	3 (2)	3 (2)	1
RfD (mg/kg-day)	0.18	0.0037	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	0.07
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	0.137 (<2) 0.047 (2 to <16) 0.039 (16+)
Endpoints	developmental, hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	cancer

Subp. 7. **Chloroform.**

CAS number: 67-66-3

Year Adopted: 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	20	20 (2)	20 (2)	NA
RfD (mg/kg-day)	--	0.022	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
Endpoints	--	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	--

Subp. 7a. [Renumbered subp 7c]

Subp. 7b. **Chlorothalonil.**

CAS number: 1897-45-6

Year Adopted: 2025

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	20	2	1	6
RfD (mg/kg-day)	--	0.014	0.00067	0.00029	--
RSC	--	0.5	0.2	0.2	--

SF (per mg/kg-day)	--	--	--	--	0.017
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.290	0.074	0.045	0.155 (_{<2}) 0.040 (_{2 to <16}) 0.042 (₁₆₊)
Endpoints	--	gastrointestinal system	gastrointestinal system	gastrointestinal system, hepatic (liver) system, renal (kidney) system	cancer

Subp. 7c. **Clothianidin.**

CAS number: 210880-92-5, 205510-53-8

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200	200 (2)	200 (2)	NA
RfD (mg/kg-day)	--	0.093	(2)	(2)	--
RSC	--	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
Endpoints	--	developmental	developmental	developmental	--

Subp. 7d. **Cyanazine.**

CAS number: 21725-46-2

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	3	3	3	1	NA
RfD (mg/kg-day)	0.0015	0.0015	0.0012	0.00022	--
RSC	0.5	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.285	0.285	0.070	0.044	--
Endpoints	developmental, female reproductive system	developmental, female reproductive system	developmental, female reproductive system, hepatic (liver) system, renal (kidney) system	None	--

Subp. 7e. **1,2-Dibromoethane (EDB).**

CAS number: 106-93-4

Year Adopted: 2025

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	10	10 (2)	9	0.03
RfD (mg/kg-day)	--	0.018	(2)	0.0021	--

RSC	--	0.2	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	3.6
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.290	(2)	0.045	0.155 (_{<2}) 0.040 (_{2 to <16}) 0.042 (₁₆₊)
Endpoints	--	female reproductive system, hepatic (liver) system, immune system, male reproductive system, renal (kidney) system, respiratory system, spleen	female reproductive system, hepatic (liver) system, immune system, male reproductive system, renal (kidney) system, respiratory system, spleen	female reproductive system, hepatic (liver) system, immune system, male reproductive system, respiratory system	cancer

Subp. 8. [Renumbered subp 7d]

Subp. 8a. [Renumbered subp 8f]

Subp. 8b. [Renumbered subp 8g]

Subp. 8c. [Renumbered subp 8h]

Subp. 8d. [Renumbered subp 8i]

Subp. 8e. **Dibutyl phthalate.**

CAS number: 84-74-2

Year Adopted: 2015

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	20	20	20 (2)	20 (2)	NA
RfD (mg/kg-day)	0.023	0.023	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	--
Endpoints	developmental (E)	developmental (E)	developmental (E)	developmental (E)	--

Subp. 8f. **1, 4-Dichlorobenzene.**

CAS number: 106-46-7

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	50	50 (2)	50 (2)	NA
RfD (mg/kg-day)	--	0.069	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	developmental, hepatic (liver)	developmental, hepatic (liver)	developmental, hepatic (liver)	--

		system, nervous system	system, nervous system	system, nervous system	
--	--	------------------------	------------------------	------------------------	--

Subp. 8g. [Repealed, 50 SR 101]

Subp. 8h. **1,2-Dichloroethane.**

CAS number: 107-06-2

Year Adopted: 2013

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200	200 (2)	60	1
RfD (mg/kg-day)	--	0.23	(2)	0.012	--
RSC	--	0.2	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	0.091
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.289	(2)	0.043	0.137 (_{<2}) 0.047 (_{2 to <16}) 0.039 (₁₆₊)
Endpoints	--	hepatic (liver) system	hepatic (liver) system	renal (kidney) system, hepatic (liver) system	cancer

Subp. 8i. **trans-1,2-Dichloroethene.**

CAS number: 156-60-5

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	50	9	NA
RfD (mg/kg-day)	--	--	0.020	0.0020	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.074	0.045	--
Endpoints	--	--	immune system	immune system	--

Subp. 8j. **1,1-Dichloroethylene (Vinylidene chloride).**

CAS number: 75-35-4

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	200	200	NA
RfD (mg/kg-day)	--	--	0.069	0.040	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.074	0.045	--
Endpoints	--	--	hepatic (liver) system	hepatic (liver) system	--

Subp. 8k. **1, 2-Dichloropropane.**

CAS number: 78-87-5

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	20	20 (2)	20 (2)	3
RfD (mg/kg-day)	--	0.029	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	0.037
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF ₂ to <16) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	0.155 _(<2) 0.040 _(2 to <16) 0.042 ₍₁₆₊₎
Endpoints	--	developmental	developmental	developmental	cancer

Subp. 9. **cis 1,2-Dichloroethylene.**

CAS number: 156-59-2

Year Adopted: 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	20	10	6	NA
RfD (mg/kg-day)	--	0.033	0.0043	0.0013	--

RSC	--	0.2	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	0.070	0.044	--
Endpoints	--	hepatic (liver) system	renal (kidney) system	renal (kidney) system	--

Subp. 10. **Dichloromethane.**

CAS number: 75-09-2

Year Adopted: 2009

Volatility: High

MCL-based HRL: 5 µg/L

Subp. 10a. **2,4-Dichlorophenoxyacetic acid (2,4-D).**

CAS number: 94-75-7

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30	30 (2)	30 (2)	NA
RfD (mg/kg-day)	--	0.048	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
Endpoints	--	adrenal, developmental, thyroid (E)	adrenal, developmental, thyroid (E)	adrenal, developmental, thyroid (E)	--

Subp. 11. **Dieldrin.**

CAS number: 60-57-1

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.2	0.2 (2)	0.2	0.006
RfD (mg/kg-day)	--	0.00011	(2)	0.000043	--
RSC	--	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	16
AF_{lifetime}	--	--	--	--	2.5
Intake Rate (L/kg-day)	--	0.285	(2)	0.044	0.044
Endpoints	--	developmental, immune system, nervous system	developmental, immune system, nervous system	developmental, hepatic (liver) system, immune system, nervous system	cancer

Subp. 11a. [Renumbered subp 11d]

Subp. 11b. [Renumbered subp 11f]

Subp. 11c. **Di(2-ethylhexyl) phthalate (DEHP).**

CAS number: 117-81-7

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	20	20	20 (2)	20 (2)	7
RfD (mg/kg-day)	0.029	0.029	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	0.014
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	0.137 _(<2) 0.047 _(2 to <16) 0.039 ₍₁₆₊₎
Endpoints	developmental (E), male reproductive system (E)	developmental (E), male reproductive system (E)	developmental (E), male reproductive system (E)	developmental (E), male reproductive system (E)	cancer

Subp. 11d. **N,N-Diethyl-meta-toluamide (DEET).**

CAS number: 134-62-3

Year Adopted: 2013

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200	200 (2)	200 (2)	NA
RfD (mg/kg-day)	--	0.23	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	0.289	(2)	(2)	--
Endpoints	--	developmental, nervous system	developmental, nervous system	developmental, nervous system	--

Subp. 11e. **Dimethenamid and Dimethenamid-p.**

CAS numbers: 87674-68-8 and 163515-14-8

Year Adopted: 2015

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	600	600 (2)	300	NA
RfD (mg/kg-day)	--	0.34	(2)	0.060	--
RSC	--	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289	(2)	0.043	--
Endpoints	--	developmental, female reproductive system, hepatic (liver) system, nervous system	developmental, female reproductive system, hepatic (liver) system, nervous system	hepatic (liver) system	--

Subp. 11f. **Dinoseb.**

CAS number: 88-85-7

Year Adopted: 2018

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	8	8 (2)	8 (2)	NA
RfD (mg/kg-day)	--	0.0048	(2)	(2)	--
RSC	--	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
Endpoints	--	developmental	developmental	developmental	--

Subp. 11g. **1,4-Dioxane.**

CAS number: 123-91-1

Year Adopted: 2013

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	300	100	1
RfD (mg/kg-day)	--	--	0.12	0.025	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	0.1
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	--	0.077	0.043	0.137 (<2) 0.047 (2 to <16)

					0.039 ₍₁₆₊₎
Endpoints	--	--	hepatic (liver) system, renal (kidney) system, respiratory system	hepatic (liver) system, renal (kidney) system, respiratory system	cancer

Subp. 12. [Repealed, 40 SR 689]

Subp. 12a. **17 α -Ethinylestradiol.**

CAS number: 57-63-6

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL ($\mu\text{g/L}$)	ND	0.0005	0.0002	0.0002	NA
RfD (mg/kg-day)	--	1.7×10^{-7}	1.4×10^{-8}	1.4×10^{-8}	--
RSC	--	0.8	0.8	0.8	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	0.074	0.045	--
Endpoints	--	developmental (E), female reproductive system (E), male reproductive system (E)	developmental	developmental	--

Subp. 12b. **Ethylbenzene.**

CAS number: 100-41-4

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	40	40 (2)	40 (2)	NA
RfD (mg/kg-day)	--	0.06	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 12c. **S-Ethyl-N,N-dipropylthiocarbamate (EPTC).**

CAS number: 759-94-4

Year Adopted: 2018

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	300	300	90	40	NA
RfD (mg/kg-day)	0.16	0.16	0.033	0.0083	--
RSC	0.5	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--

ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.285	0.285	0.070	0.044	--
Endpoints	nervous system	developmental, female reproductive system, nervous system	cardiovascular system	cardiovascular system	--

Subp. 12d. **Ethylene glycol.**

CAS number: 107-21-1

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	2,000	2,000	2,000	NA
RfD (mg/kg-day)	--	0.33	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.038	(2)	(2)	--
Endpoints	--	developmental	developmental, renal (kidney) system	developmental, male reproductive system, renal (kidney) system	--

Subp. 12e. **Fluoranthene.**

CAS number: 206-44-0

Year Adopted: 2018

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	200	70	NA
RfD (mg/kg-day)	--	--	0.053	0.016	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.070	0.044	--
Endpoints	--	--	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 12f. **Fluorene (9H-Fluorene).**

CAS number: 86-73-7

Year Adopted: 2023

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	200	80	NA
RfD (mg/kg-day)	--	--	0.058	0.018	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--

ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.074	0.045	--
Endpoints	--	--	hematological (blood) system, spleen	hematological (blood) system, spleen	--

Subp. 12g. **Fomesafen.**

CAS number: 72178-02-0

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200	200 (2)	20	NA
RfD (mg/kg-day)	--	0.12	(2)	0.005	--
RSC	--	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	0.045	--
Endpoints	--	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	hepatic (liver) system	--

Subp. 12h. **Imidacloprid.**

CAS number: 138261-41-3

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	100	2	2 (2)	2 (2)	NA
RfD (mg/kg-day)	0.15	0.0036	(2)	(2)	--
RSC	0.2	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.290	0.290	(2)	(2)	--
Endpoints	nervous system	immune system	immune system	immune system	--

Subp. 12i. **Manganese.**

CAS number: 7439-96-5

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	ND	ND	NA
RfD (mg/kg-day)	--	0.083	--	--	--
RSC	--	0.5	--	--	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	--	--	--
Endpoints	--	developmental, nervous system	--	--	--

Subp. 12j. **Metolachlor and S-Metolachlor.**

CAS number: 51218-45-2; 87392-12-9

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	300	300 (2)	300 (2)	NA
RfD (mg/kg-day)	--	0.19	(2)	(2)	--
RSC	--	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	developmental	developmental	developmental	--

Subp. 12k. **Metolachlor ESA.**

CAS number: 171118-09-5

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	7,000	1,000	NA
RfD (mg/kg-day)	--	--	2.7	0.27	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	--	0.074	0.045	--
Endpoints	--	--	hepatic (liver) system	hepatic (liver) system	--

Subp. 12l. **Metolachlor OXA.**

CAS number: 152019-73-3

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	5,000	5,000 (2)	1,000	NA
RfD (mg/kg-day)	--	2.7	(2)	0.27	--
RSC	--	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	0.045	--
Endpoints	--	none	none	none	--

Subp. 12m. **Metribuzin.**

CAS number: 21087-64-9

Year Adopted: 2013

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	30	10	10 (2)	10 (2)	NA
RfD (mg/kg-day)	0.016	0.006	(2)	(2)	--

RSC	0.5	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	--
Endpoints	developmental, nervous system	thyroid (E)	thyroid (E)	thyroid (E)	--

Subp. 12n. **Naphthalene.**

CAS number: 91-20-3

Year Adopted: 2013

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	70	70	70 (2)	70	NA
RfD (mg/kg-day)	0.038	0.038	(2)	0.016	--
RSC	0.5	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	(2)	0.043	--
Endpoints	nervous system	nervous system	nervous system	nervous system, spleen	--

Subp. 13. **Nitrate (as N).**

CAS number: 14797-55-8

Year Adopted: 2009

Volatility: Nonvolatile

MCL-based HRL: 10,000 µg/L

Subp. 13a. **p-Nonylphenol (4-Nonylphenol).**

CAS number: 84852-15-3

Year Adopted: 2023

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	40	20	NA
RfD (mg/kg-day)	--	0.21	0.016	0.0049	--
RSC	--	0.2	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	0.074	0.045	--
Endpoints	--	developmental, female reproductive system	renal (kidney) system	renal (kidney) system	--

Subp. 13b. **4-tert-Octylphenol.**

CAS number: 140-66-9

Year Adopted: 2023

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	100 (2)	100 (2)	NA
RfD (mg/kg-day)	--	0.17	(2)	(2)	--

RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	developmental	developmental	developmental	--

Subp. 14. **Pentachlorophenol (PCP).**

CAS number: 87-86-5

Year Adopted: 2015

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	7	7	7 (2)	7 (2)	0.3
RfD (mg/kg-day)	0.0040	0.0040	(2)	(2)	--
RSC	0.5	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	0.4
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	0.137 _(<2) 0.047 _(2 to <16) 0.039 ₍₁₆₊₎
Endpoints	developmental, thyroid (E)	developmental (E), thyroid (E)	developmental (E), hepatic (liver) system, immune system, male reproductive	developmental (E), hepatic (liver) system, immune system, male reproductive	cancer

			system, thyroid (E)	system, thyroid (E)	
--	--	--	------------------------	------------------------	--

Subp. 14a. **Perfluorobutane sulfonate (PFBS).**

CAS number: 45187-15-3; 375-73-5; 29420-49-3; 68259-10-9; 60453-92-1

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.1	0.1 (2)	0.1 (2)	NA
RfD (mg/kg-day)	--	0.000084	(2)	(2)	--
RSC	--	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	thyroid (E)	thyroid (E)	thyroid (E)	--

Subp. 14b. **Perfluorobutanoate (PFBA).**

CAS number: 45048-62-2; 375-22-4

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	7	7 (2)	7 (2)	NA
RfD (mg/kg-day)	--	0.0038	(2)	(2)	--
RSC	--	0.5	(2)	(2)	--

SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
Endpoints	--	hepatic (liver) system, thyroid (E)	hepatic (liver) system, thyroid (E)	hepatic (liver) system, thyroid (E)	--

Subp. 14c. **Perfluorohexane sulfonate (PFHxS) and salts.**

CAS number: 108427-53-8; 355-46-4; 3871-99-6

Year Adopted: 2023

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	NA	0.047	0.047	0.047	NA
RfD (mg/kg-day)	--	0.0000097	0.0000097	0.0000097	--
RSC	--	0.5	--	--	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	*	*	*	--
Endpoints	--	hepatic (liver) system, thyroid (E)	hepatic (liver) system, thyroid (E)	hepatic (liver) system, thyroid (E)	--

* 95th percentile water intake rates (Tables 3-1, 3-3, and 3-5 Environmental Protection Agency, Exposure Factors Handbook, 2019) or upper percentile breast milk intake rates (Table 15-1, Environmental Protection Agency, Exposure Factors Handbook, 2011), and MDH background information.

Subp. 14d. **Perfluorohexanoate (PFHxA) and salts.**

CAS number: 92912-52-7; 307-24-4; 21615-47-4; 2923-26-4

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.2	0.2 (2)	0.2 (2)	NA
RfD (mg/kg-day)	--	0.00032	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	developmental, thyroid (E)	developmental, thyroid (E)	developmental, thyroid (E)	--

Subp. 15. **Perfluorooctane sulfonate (PFOS) and salts.**

CAS number: 45298-90-6; 1763-23-1; 29081-56-9; 2795-39-3; 70225-14-8; and 29457-72-5

Year Adopted: 2025

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.0023	0.0023	0.0023	0.0076
RfSC (ng/mL)*	--	2.6	2.6	2.6	--
RSC	--	0.2	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	13

ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF ₂ to <16) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	#	#	#	0.155 (_{<2}) 0.040 (_{2 to <16}) 0.042 (₁₆₊)
Endpoints	--	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	cancer

* A reference serum concentration (ng/mL) rather than a reference dose (mg/kg-d) was used in MDH's toxicokinetic model to calculate noncancer guidance values for PFOS.

95th percentile water intake rates (Tables 3-1, 3-3, and 3-5 in the Environmental Protection Agency, Exposure Factors Handbook, 2019), or upper percentile breast milk intake rates (Table 15-1), Environmental Protection Agency Exposure Factors Handbook, 2011.

Subp. 16. Perfluorooctanoate (PFOA) and salts.

CAS number: 45285-51-6; 335-67-1; 3825-26-1; 2395-00-8; 335-93-3; and 335-95-5

Year Adopted: 2025

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.00024	0.00024	0.00024	0.0000079
RfSC (ng/mL)*	--	0.93	0.93	0.93	--
RSC	--	0.2	0.2	0.2	--
SF (per ng/kg-day)	--	--	--	--	0.0126
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2})

					3 (ADAF ₂ to <16) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	#	#	#	0.155 (<2) 0.040 (2 to <16) 0.042 (16+)
Endpoints	--	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	cancer

* A reference serum concentration (ng/mL) rather than a reference dose (mg/kg-d) was used in MDH's toxicokinetic model to calculate noncancer guidance values for PFOA.

95th percentile water intake rates (Tables 3-1, 3-3, and 3-5 in the Environmental Protection Agency, Exposure Factors Handbook, 2019), or upper percentile breast milk intake rates (Table 15-1), Environmental Protection Agency Exposure Factors Handbook, 2011.

Subp. 16a. **Pyrene.**

CAS number: 129-00-0

Year Adopted: 2018

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	90	50	NA
RfD (mg/kg-day)	--	--	0.033	0.010	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	--	0.070	0.044	--
Endpoints	--	--	renal (kidney) system	renal (kidney) system	--

Subp. 16b. **Quinoline.**

CAS number: 91-22-5

Year Adopted: 2023

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	ND	4	0.03
RfD (mg/kg-day)	--	--	--	0.00079	--
RSC	--	--	--	0.2	--
SF (per mg/kg-day)	--	--	--	--	3
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	--	--	0.045	0.155 (_{<2}) 0.040 (_{2 to <16}) 0.042 (₁₆₊)
Endpoints	--	--	--	hematological (blood) system, hepatic (liver) system, renal (kidney) system, respiratory system, and spleen	cancer

Subp. 17. **Simazine.**

CAS number: 122-34-9

Year Adopted: 2009

Volatility: Nonvolatile

MCL-based HRL: 4 µg/L

Subp. 17a. **Sulfamethazine (includes sodium salt form).**

CAS number: 57-68-1 (1981-58-4)

Year Adopted: 2015

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	100 (2)	100 (2)	NA
RfD (mg/kg-day)	--	0.040	(2)	(2)	--
RSC	--	0.8	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289	(2)	(2)	--
Endpoints	--	thyroid	thyroid	thyroid	--

Subp. 18. **Tetrachloroethylene (PCE or PERC).**

CAS number: 127-18-4

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	7	7 (3)	4

RfD (mg/kg-day)	--	--	0.0026	(3)	--
RSC	--	--	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	0.0249
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF ₂ to <16) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	--	0.074	(3)	0.155 _(<2) 0.040 _(2 to <16) 0.042 (16+)
Endpoints	--	--	nervous system	nervous system	cancer

Subp. 18a. **Tetrahydrofuran.**

CAS number: 109-99-9

Year Adopted: 2018

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	600	600 (2)	600 (2)	NA
RfD (mg/kg-day)	--	0.82	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
Endpoints	--	developmental	developmental	developmental	--

Subp. 18b. **Thiamethoxam.**

CAS number: 153719-23-4

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	400	200	200 (3)	NA
RfD (mg/kg-day)	--	0.25	0.057	(3)	--
RSC	--	0.5	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.285	0.070	(3)	--
Endpoints	--	developmental, female reproductive system, hepatic (liver) system	male reproductive system	male reproductive system	--

Subp. 18c. **Toluene.**

CAS number: 108-88-3

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	70	70 (2)	70 (2)	NA

RfD (mg/kg-day)	--	0.10	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	immune system, nervous system	immune system, nervous system	immune system, nervous system	--

Subp. 18d. **1,2,4-Trichlorobenzene.**

CAS number: 120-82-1

Year Adopted: 2013

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	100 (2)	100	4
RfD (mg/kg-day)	--	0.17	(2)	0.021	--
RSC	--	0.2	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	0.029
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.289	(2)	0.043	0.137 (<2) 0.047 (2 to <16)

					0.039 ⁽¹⁶⁺⁾
Endpoints	--	hepatic (liver) system, adrenal (E), hematological (blood) system	hepatic (liver) system, adrenal (E), hematological (blood) system	hepatic (liver) system, adrenal (E), renal (kidney) system	cancer

Subp. 19. **1,1,1-Trichloroethane.**

CAS number: 71-55-6

Year Adopted: 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	9,000	5,000	NA
RfD (mg/kg-day)	--	--	3.0	1.0	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.070	0.044	--
Endpoints	--	--	hepatic (liver) system, male reproductive system	hepatic (liver) system, male reproductive system	--

Subp. 20. **1,1,2-Trichloroethylene (TCE).**

CAS number: 79-01-6

Year Adopted: 2015

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.4	0.4	0.4 (3)	2
RfD (mg/kg-day)	--	0.00052	0.00017	(3)	--
RSC	--	0.2	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	0.05
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.289	0.077	(3)	0.137 _(<2) 0.047 _(2 to <16) 0.039 ₍₁₆₊₎
Endpoints	--	developmental, immune system	developmental, immune system	developmental, immune system	cancer

Subp. 21. **2(2,4,5-Trichlorophenoxy)propionic acid (2,4,5-TP or Silvex).**

CAS number: 93-72-1

Year Adopted: 2009

Volatility: Nonvolatile

MCL-based HRL: 50 µg/L

Subp. 21a. **1,2,3-Trichloropropane.**

CAS number: 96-18-4

Year Adopted: 2013

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	7	7	7 (2)	7 (2)	0.003
RfD (mg/kg-day)	0.0042	0.0042	(2)	(2)	--

RSC	0.5	0.5	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	30
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	0.137 (_{<2}) 0.047 (_{2 to <16}) 0.039 (₁₆₊)
Endpoints	developmental	developmental	developmental	developmental	cancer

Subp. 21b. **1,2,3-Trimethylbenzene.**

CAS number: 526-73-8

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30	30 (2)	30 (2)	NA
RfD (mg/kg-day)	--	0.042	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	nervous system	nervous system	nervous system	--

Subp. 21c. **1,2,4-Trimethylbenzene.**

CAS number: 95-63-6

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30	30 (2)	30 (2)	NA
RfD (mg/kg-day)	--	0.042	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	nervous system	nervous system	nervous system	--

Subp. 22. **1,3,5-Trimethylbenzene.**

CAS number: 108-67-8

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30	30 (2)	30 (2)	NA
RfD (mg/kg-day)	--	0.042	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	nervous system	nervous system	nervous system	--

Subp. 22a. **Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)**

CAS number: 13674-87-8

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	20	8	0.8
RfD (mg/kg-day)	--	--	0.0067	0.0019	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	0.13
ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF ₂ to <16) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	--	0.074	0.045	0.155 _(<2) 0.040 _(2 to <16) 0.042 (16+)
Endpoints	--	--	hepatic (liver) system; kidney system	male reproductive system; renal (kidney) system	cancer

Subp. 22b. **Tris(2-butoxyethyl) phosphate (TBEP)**

CAS number: 78-51-3

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30	30 (2)	30	NA
RfD (mg/kg-day)	--	0.043	(2)	0.0074	--
RSC	--	0.2	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	0.045	--
Endpoints	--	hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	--

Subp. 22c. **Tris(2-chloroethyl) phosphate.**

CAS number: 115-96-8

Year Adopted: 2013

Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	300	200	200 (3)	5
RfD (mg/kg-day)	--	0.15	0.068	(3)	--
RSC	--	0.5	0.2	(3)	--
SF (per mg/kg-day)	--	--	--	--	0.02

ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
Intake Rate (L/kg-day)	--	0.289	0.077	(3)	0.137 (_{<2}) 0.047 (_{2 to <16}) 0.039 (₁₆₊)
Endpoints	--	renal (kidney) system, nervous system, developmental	renal (kidney) system	renal (kidney) system	cancer

Subp. 22d. **Venlafaxine.**

CAS number: 93413-69-5 (free base), 93300-78-4 (HCl salt)

Year Adopted: 2023

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	10	10 (2)	10 (2)	NA
RfD (mg/kg-day)	--	0.0054	(2)	(2)	--
RSC	--	0.8	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.290	(2)	(2)	--
Endpoints	--	developmental, gastrointestinal system, male	developmental, gastrointestinal system, male	developmental, gastrointestinal system, male	--

		reproductive system, nervous system (E)	reproductive system, nervous system (E)	reproductive system, nervous system (E)	
--	--	---	---	---	--

Subp. 23. **Vinyl Chloride.**

CAS number: 75-01-4

Year Adopted: 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	90	10	0.2
RfD (mg/kg-day)	--	--	0.033	0.0030	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	1.4
AF_{lifetime}	--	--	--	--	1
Intake Rate (L/kg-day)	--	--	0.070	0.044	0.044
Endpoints	--	--	hepatic (liver) system	hepatic (liver) system	cancer

Subp. 23a. **Xylenes.**

CAS number: 1330-20-7

Year Adopted: 2023

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	700	300	300	300 (3)	NA
RfD (mg/kg-day)	1.0	0.38	0.12	(3)	--
RSC	0.2	0.2	0.2	(3)	--

SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.290	0.290	0.074	(3)	--
Endpoints	nervous system	developmental, nervous system	developmental, renal (kidney) system, nervous system	developmental, renal (kidney) system, nervous system	--

Subp. 24. **Transition.** The health risk limits established for the specific chemicals in this part supersede the health risk limits for those chemicals in part 4717.7500. For chemicals not included in this part, the health risk limits established in part 4717.7500 remain in place.

Statutory Authority: *MS s 103H.201; 144.0751; 144.12; L 2023 c 60 art 3 s 34*

History: *33 SR 1792; 35 SR 1395; 38 SR 397; 40 SR 689; 43 SR 262; 48 SR 465; 50 SR 101*

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