

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: 2011

Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	9,000	8,000	4,000	NA
RfD (mg/kg-day)	--	5.0	3.0	0.90	--
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	--	renal (kidney) system	renal (kidney) system, hematological (blood) system	renal (kidney) system, hematological (blood) 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	developmental, male reproductive	developmental, male reproductive	cancer

		system, nervous system	system, nervous system	system, nervous system	
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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. 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. **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. 6d. **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. 6e. **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. 6f. **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	0.289	0.289	(2)	(2)	--

(L/kg-day)					
Endpoints	develop- mental, nervous system	develop- mental, hematological (blood) system, hepatic (liver) system, immune system, nervous system, male reproductive system (E), female reproductive system (E), thyroid (E)	develop- mental, hematological (blood) system, hepatic (liver) system, immune system, nervous system, male reproductive system (E), female reproductive system (E), thyroid (E)	develop- mental, hematological (blood) system, hepatic (liver) system, immune system, nervous system, male reproductive system (E), female reproductive system (E), thyroid (E)	--

Subp. 6g. **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	develop- mental, 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. **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. 8. **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. 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. **Dichlorodifluoromethane.**

CAS number: 75-71-8

Year Adopted: 2011

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	ND	700	NA
RfD (mg/kg-day)	--	--	--	0.15	--
RSC	--	--	--	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	--	0.043	--
Endpoints	--	--	--	None	--

Subp. 8g. **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. 8h. **trans-1,2-Dichloroethene.**

CAS number: 156-60-5

Year Adopted: 2013

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	200	40	NA
RfD (mg/kg-day)	--	--	0.091	0.0091	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.077	0.043	--
Endpoints	--	--	immune system	immune system	--

Subp. 8i. **1,1-Dichloroethylene.**

CAS number: 75-35-4

Year Adopted: 2011

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	200	200	NA
RfD (mg/kg-day)	--	--	0.090	0.046	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--

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

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. **Ethylbenzene.**

CAS number: 100-41-4

Year Adopted: 2011

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	50	50 (2)	50 (2)	NA
RfD (mg/kg-day)	--	0.075	(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	--	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 12b. **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. 12c. **Ethylene glycol.**

CAS number: 107-21-1

Year Adopted: 2011

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	4,000	4,000	2,000	2,000	NA
RfD (mg/kg-day)	0.76	0.76	0.72	0.50	--
RSC	0.2	0.2	0.2	0.2	--

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

Subp. 12d. **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. 12e. **Metolachlor and S-Metolachlor.**

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

Year Adopted: 2011

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	400	400	300	300 (3)	NA
RfD (mg/kg-day)	0.24	0.24	0.097	(3)	--
RSC	0.5	0.5	0.2	(3)	--

SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289	0.289	0.077	(3)	--
Endpoints	developmental	developmental	none	none	--

Subp. 12f. **Metolachlor ESA.**

CAS number: 171118-09-5

Year Adopted: 2011

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	4,000	800	NA
RfD (mg/kg-day)	--	--	1.7	0.17	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.077	0.043	--
Endpoints	--	--	hepatic (liver) system	hepatic (liver) system	--

Subp. 12g. **Metolachlor OXA.**

CAS number: 152019-73-3

Year Adopted: 2011

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	3,000	3,000 (2)	800	NA
RfD (mg/kg-day)	--	1.7	(2)	0.17	--
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	--	none	none	none	--

Subp. 12h. **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. 12i. **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. 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 system, thyroid (E)	developmental (E), hepatic (liver) system, immune system, male reproductive system, thyroid (E)	cancer

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

CAS number: 375-73-5
 Year Adopted: 2011
 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	9	7	NA

RfD (mg/kg-day)	--	--	0.0042	0.0014	--
RSC	--	--	0.5	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	0.245	0.043	--
Endpoints	--	--	hepatic (liver) system, hematological (blood) system, renal (kidney) system	hepatic (liver) system, hematological (blood) system, renal (kidney) system	--

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. 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: 2009

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	ND	0.3	NA
RfD (mg/kg-day)	--	--	--	0.00008	--
RSC	--	--	--	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	--	0.049	--
Endpoints	--	--	--	developmental, hepatic (liver) system, thyroid (E)	--

Subp. 16. **Perfluorooctanoate (PFOA) and salts.**

CAS number: 45285-51-6; 335-67-1; 335-66-0; 3825-26-1; 2395-00-8; 335-93-3; and 335-95-5

Year Adopted: 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	0.035	0.035	0.035	NA
RfD (mg/kg-day)	--	0.000018	0.000018	0.000018	--
RSC	--	0.5	0.5	0.5	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	*	*	*	--
Endpoints	--	developmental, hepatic (liver) system, immune system, renal (kidney) system	developmental, hepatic (liver) system, immune system, renal (kidney) system	developmental, hepatic (liver) system, immune system, renal (kidney) system	--

* 95th percentile water intake rates (Tables 3-1 and 3-3), or upper percentile breast milk intake rates (Table 15-1), Environmental Protection Agency (EPA) 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. 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. **1,1,2,2-Tetrachloroethylene.**

CAS number: 127-18-4

Year Adopted: 2009

Volatility: High

MCL-based HRL: 5 µg/L

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: 2011

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200	200 (2)	200 (2)	NA
RfD (mg/kg-day)	--	0.22	(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	--	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. 22. **1,3,5-Trimethylbenzene.**

CAS number: 108-67-8

Year Adopted: 2009

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	100	100 (2)	100 (2)	NA
RfD (mg/kg-day)	ND	0.14	(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	--	hepatic (liver) system	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--

Subp. 22a. **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 (ADAF₂)

					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. 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: 2011

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	800	300	300 (2)	300 (2)	NA
RfD (mg/kg-day)	1.2	0.5	(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	nervous system	nervous system	renal (kidney) system, nervous system	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*

History: *33 SR 1792; 35 SR 1395; 38 SR 397; 40 SR 689; 43 SR 262*

Published Electronically: *September 12, 2018*