

Minnesota Department of Health

Proposed Permanent Rules Relating to Health Risk Limits

4717.7500 TABLE OF HEALTH RISK LIMITS.

Subpart 1. **Generally.** This part contains the table of the health risk limits. ~~For each substance or chemical listed in a subpart, the information required by part 4717.7400 shall be specified in the manner required by this subpart.~~

CAS RN	RfD* (milligrams per kilogram per day)	Slope factor* (the inverse of milligrams per kilogram per day)	Health Risk Limit (micrograms per liter)
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Subp. 2. [See repealer.]

[For text of subps 3 to 44, see M.R.]

Subp. 45. [See repealer.]

[For text of subps 45a to 50, see M.R.]

Subp. 51. [See repealer.]

[For text of subps 52 and 52a, see M.R.]

Subp. 53. [See repealer.]

[For text of subps 54 to 74, see M.R.]

Subp. 75. [See repealer.]

[For text of subps 76 to 90, see M.R.]

4717.7860 HEALTH RISK LIMITS TABLE.

[For text of subp 1, see M.R.]

Subp. 2. **Explanation of table in this part.**

A. "--" symbol means not relevant.

*[For text of items B to E, see M.R.]*Subp. 2a. **Acenaphthene.**CAS number: 83-32-9Year Adopted: 2018Volatility: Moderate

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

Subp. 2a 2b. **Acetaminophen.**

CAS number: 103-90-2

Year Adopted: 2015

Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	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: ~~2009~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	40 <u>ND</u>	40 <u>30</u>	40 (2) <u>30</u>	9 <u>20</u>	NA
RfD (mg/kg-day)	0.021 --	0.021 <u>0.016</u>	(2) <u>0.012</u>	0.002 <u>0.0039</u>	--
RSC	0.5 --	0.5	(2) <u>0.2</u>	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	0.289 --	0.289 <u>0.285</u>	(2) <u>0.070</u>	0.043 <u>0.044</u>	--
Endpoints	developmental --	developmental <u>hepatic (liver)</u>	developmental <u>hepatic (liver)</u>	hepatic (liver) system, male	--

		<u>system, thyroid</u> (E)	<u>system, male reproductive system, nervous system, renal (kidney) system</u>	reproductive system, nervous system, renal (kidney) system, respiratory system	
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Subp. 3a. **Acetochlor ESA.**

CAS number: 187022-11-3

Year Adopted: ~~2011~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	600 <u>500</u>	600 <u>500</u>	300	NA
RfD (mg/kg-day)	--	0.37 <u>0.29</u>	0.23 <u>0.19</u>	0.075 <u>0.056</u>	--
RSC	--	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289 <u>0.285</u>	0.077 <u>0.070</u>	0.043 <u>0.044</u>	--
Endpoints	--	thyroid (E)	<u>male reproductive system, thyroid (E)</u>	<u>male reproductive system, thyroid (E)</u>	--

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

CAS number: 184992-44-4

Year Adopted: ~~2011~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200 <u>100</u>	200 <u>100 (2)</u>	100 <u>90</u>	NA
RfD (mg/kg-day)	--	0.12 <u>0.081</u>	0.077 <u>(2)</u>	0.026 <u>0.019</u>	--
RSC	--	0.5	0.2 <u>(2)</u>	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289 <u>0.285</u>	0.077 <u>(2)</u>	0.043 <u>0.044</u>	--
Endpoints	--	thyroid (E)	thyroid (E)	thyroid (E)	--

*[For text of subs 3c to 3e, see M.R.]*Subp. 4. **Alachlor.**

CAS number: 15972-60-8

Year Adopted: ~~2009~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	200 <u>100</u>	30 <u>60</u>	5 <u>9</u>	NA
RfD (mg/kg-day)	--	0.1 <u>0.077</u>	0.01 <u>0.020</u>	0.001 <u>0.0020</u>	--

RSC	--	0.5	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289 <u>0.285</u>	0.077 <u>0.070</u>	0.043 <u>0.044</u>	--
Endpoints	--	<u>developmental, renal (kidney) system</u>	<u>hematological (blood) system, hepatic (liver) system, hematological (blood) renal (kidney) system</u>	<u>hematological (blood) system, hepatic (liver) system, hematological (blood) renal (kidney) system</u>	--

[For text of subs 5 to 6g, see M.R.]

Subp. 7. **Chloroform.**

CAS number: 67-66-3

Year Adopted: ~~2009~~ 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	30 <u>20</u>	30 <u>20</u> (2)	30 <u>20</u> (2)	NA
RfD (mg/kg-day)	--	0.05 <u>0.022</u>	(2)	(2)	--
RSC	--	0.2	(2)	(2)	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--

Intake Rate (L/kg-day)	--	0.289 <u>0.285</u>	(2)	(2)	--
Endpoints	--	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system, male reproductive system	developmental, hepatic (liver) system, immune system, male reproductive system	--

Subp. 7a. **Clothianidin.**

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

Year Adopted: 2018

Volatility: Nonvolatile

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

Subp. 8. **Cyanazine.**

CAS number: 21725-46-2

Year Adopted: ~~2009~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	2 <u>3</u>	2 <u>3</u>	2 <u>3</u>	1	NA
RfD (mg/kg-day)	0.001 <u>0.0015</u>	0.001 <u>0.0015</u>	0.00063 <u>0.0012</u>	0.00026 <u>0.00022</u>	--
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 <u>0.285</u>	0.289 <u>0.285</u>	0.077 <u>0.070</u>	0.043 <u>0.044</u>	--
Endpoints	developmental, <u>female reproductive system</u>	developmental, <u>female reproductive system</u>	<u>developmental, female reproductive system,</u> hepatic (liver) system, renal (kidney) system	None	--

[For text of subps 8a to 8i, see M.R.]

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

CAS number: 156-59-2

Year Adopted: ~~2009~~ 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	70 <u>20</u>	70 (2) <u>10</u>	50 <u>6</u>	NA
RfD (mg/kg-day)	--	0.097 <u>0.033</u>	(2) <u>0.0043</u>	0.011 <u>0.0013</u>	--
RSC	--	0.2	(2) <u>0.2</u>	0.2	--

SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289 <u>0.285</u>	(2) <u>0.070</u>	0.043 <u>0.044</u>	--
Endpoints	--	hematological (blood) <u>hepatic (liver) system</u>	hematological (blood) <u>renal (kidney) system</u>	hematological (blood) <u>renal (kidney) system</u>	--

[For text of subp 10, see M.R.]

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

CAS number: 94-75-7

Year Adopted: 2018

Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	<u>ND</u>	<u>30</u>	<u>30 (2)</u>	<u>30 (2)</u>	<u>NA</u>
<u>RfD (mg/kg-day)</u>	--	<u>0.048</u>	<u>(2)</u>	<u>(2)</u>	--
<u>RSC</u>	--	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	--
<u>SF (per mg/kg-day)</u>	--	--	--	--	--
<u>ADAF or AF_{lifetime}</u>	--	--	--	--	--
<u>Intake Rate (L/kg-day)</u>	--	<u>0.285</u>	<u>(2)</u>	<u>(2)</u>	--
<u>Endpoints</u>	--	<u>adrenal, developmental, thyroid (E)</u>	<u>adrenal, developmental, thyroid (E)</u>	<u>adrenal, developmental, thyroid (E)</u>	--

Subp. 11. **Dieldrin.**

CAS number: 60-57-1

Year Adopted: ~~2009~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	0.2 <u>ND</u>	0.2	0.2 (2)	0.2	0.006
RfD (mg/kg-day)	0.0001 --	0.0001 <u>0.00011</u>	(2)	0.00005 <u>0.000043</u>	--
RSC	0.5 --	0.5	(2)	0.2	--
SF (per mg/kg-day)	--	--	--	--	16
AF_{lifetime}	--	--	--	--	2.5
Intake Rate (L/kg-day)	0.289 --	0.289 <u>0.285</u>	(2)	0.043 <u>0.044</u>	0.043 <u>0.044</u>
Endpoints	developmental --	developmental, immune system, nervous system	developmental, immune system, nervous system	developmental , hepatic (liver) system, <u>immune system</u> , nervous system	cancer

*[For text of subs 11a to 11e, see M.R.]*Subp. 11f. **Dinoseb.**CAS number: 88-85-7Year Adopted: 2018Volatility: Moderate

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

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

CAS number: 123-91-1

Year Adopted: 2013

Volatility: Low

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

(L/kg-day)					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

[For text of subps 12 and 12a, see M.R.]

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

CAS number: 759-94-4

Year Adopted: 2018

Volatility: Moderate

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	<u>300</u>	<u>300</u>	<u>90</u>	<u>40</u>	<u>NA</u>
<u>RfD (mg/kg-day)</u>	<u>0.16</u>	<u>0.16</u>	<u>0.033</u>	<u>0.0083</u>	<u>--</u>
<u>RSC</u>	<u>0.5</u>	<u>0.5</u>	<u>0.2</u>	<u>0.2</u>	<u>--</u>
<u>SF (per mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>ADAF or AF_{lifetime}</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>Intake Rate (L/kg-day)</u>	<u>0.285</u>	<u>0.285</u>	<u>0.070</u>	<u>0.044</u>	<u>--</u>
<u>Endpoints</u>	<u>nervous system</u>	<u>developmental, female reproductive system, nervous system</u>	<u>cardiovascular system</u>	<u>cardiovascular system</u>	<u>--</u>

Subp. ~~12b~~ 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

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>200</u>	<u>70</u>	<u>NA</u>
<u>RfD (mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>0.053</u>	<u>0.016</u>	<u>--</u>
<u>RSC</u>	<u>--</u>	<u>--</u>	<u>0.2</u>	<u>0.2</u>	<u>--</u>

<u>SF (per mg/kg-day)</u>	--	--	--	--	--
<u>ADAF or AF_{lifetime}</u>	--	--	--	--	--
<u>Intake Rate (L/kg-day)</u>	--	--	<u>0.070</u>	<u>0.044</u>	--
<u>Endpoints</u>	--	--	<u>hepatic (liver) system, renal (kidney) system</u>	<u>hepatic (liver) system, renal (kidney) system</u>	--

Subp. 12e 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. ~~12d~~ 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. ~~12e~~ 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. ~~12f~~ 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. ~~12g~~ 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	--

[For text of subps 13 to 14a, see M.R.]

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

CAS number: 375-22-4

Year Adopted: ~~2011~~ 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)	--	0.289 <u>0.285</u>	(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: 1763-23-1; 29081-56-9; 2795-39-3; 70225-14-8; and 29457-72-5

Year Adopted: ~~2009~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND <u>0.027</u>	ND <u>0.027</u>	0.3 <u>0.027</u>	NA
RfD (mg/kg-day)	--	-- <u>0.0000051</u>	-- <u>0.0000051</u>	0.000008 <u>0.0000051</u>	--
RSC	--	-- <u>0.5</u>	-- <u>0.5</u>	0.2 <u>0.5</u>	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	-- *	-- *	0.049 *	--
Endpoints	--	-- <u>developmental, hepatic (liver) system, immune system, thyroid (E)</u>	-- <u>developmental, hepatic (liver) system, immune system, thyroid (E)</u>	developmental, hepatic (liver) system, immune system, thyroid (E)	--

* 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. 16. **Perfluorooctanoic acid (PFOA) and salts.**

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

Year Adopted: ~~2009~~ 2018

Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND <u>0.035</u>	ND <u>0.035</u>	0.3 <u>0.035</u>	NA
RfD (mg/kg-day)	--	-- <u>0.000018</u>	-- <u>0.000018</u>	0.000077 <u>0.000018</u>	--
RSC	--	-- <u>0.5</u>	-- <u>0.5</u>	0.2 <u>0.5</u>	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	-- * —	-- * —	0.053 * —	--
Endpoints	--	-- <u>developmental, hepatic (liver) system, immune system, renal (kidney) system</u>	-- <u>developmental, hepatic (liver) system, immune system, renal (kidney) system</u>	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

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>90</u>	<u>50</u>	<u>NA</u>
<u>RfD (mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>0.033</u>	<u>0.010</u>	<u>--</u>
<u>RSC</u>	<u>--</u>	<u>--</u>	<u>0.2</u>	<u>0.2</u>	<u>--</u>
<u>SF (per mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>ADAF or AF_{lifetime}</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>Intake Rate (L/kg-day)</u>	<u>--</u>	<u>--</u>	<u>0.070</u>	<u>0.044</u>	<u>--</u>
<u>Endpoints</u>	<u>--</u>	<u>--</u>	<u>renal (kidney) system</u>	<u>renal (kidney) system</u>	<u>--</u>

[For text of subps 17 to 18, see M.R.]

Subp. 18a. Tetrahydrofuran.

CAS number: 109-99-9

Year Adopted: 2018

Volatility: Moderate

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	<u>ND</u>	<u>600</u>	<u>600 (2)</u>	<u>600 (2)</u>	<u>NA</u>
<u>RfD (mg/kg-day)</u>	<u>--</u>	<u>0.82</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
<u>SF (per mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>ADAF or AF_{lifetime}</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>Intake Rate (L/kg-day)</u>	<u>--</u>	<u>0.285</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
<u>Endpoints</u>	<u>--</u>	<u>developmental</u>	<u>developmental</u>	<u>developmental</u>	<u>--</u>

Subp. 18b. Thiamethoxam.

CAS number: 153719-23-4

Year Adopted: 2018

Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
<u>HRL (µg/L)</u>	<u>ND</u>	<u>400</u>	<u>200</u>	<u>200</u>	<u>NA</u>
<u>RfD (mg/kg-day)</u>	<u>--</u>	<u>0.25</u>	<u>0.057</u>	<u>(3)</u>	<u>--</u>
<u>RSC</u>	<u>--</u>	<u>0.5</u>	<u>0.2</u>	<u>(3)</u>	<u>--</u>
<u>SF (per mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
<u>ADAF or AF_{lifetime}</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>

<u>Intake Rate</u> <u>(L/kg-day)</u>	--	<u>0.285</u>	<u>0.070</u>	<u>(3)</u>	--
<u>Endpoints</u>	--	<u>developmental,</u> <u>female</u> <u>reproductive</u> <u>system, hepatic</u> <u>(liver) system</u>	<u>male</u> <u>reproductive</u> <u>system</u>	<u>male</u> <u>reproductive</u> <u>system</u>	--

Subp. ~~18a~~ 18c. **Toluene.**

CAS number: 108-88-3

Year Adopted: 2011

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL ($\mu\text{g/L}$)	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. ~~18b~~ 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), hemato-logical (blood) system	hepatic (liver) system, adrenal (E), hemato-logical (blood) system	hepatic (liver) system, adrenal (E), renal (kidney) system	cancer

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

CAS number: 71-55-6

Year Adopted: ~~2009~~ 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	20,000 <u>9,000</u>	9,000 <u>5,000</u>	NA

RfD (mg/kg-day)	--	--	<u>7</u> 3.0	<u>2</u> 1.0	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	--	<u>0.077</u> 0.070	<u>0.043</u> 0.044	--
Endpoints	--	--	hepatic (liver) system, male reproductive system	hepatic (liver) system, male reproductive system	--

[For text of subps 20 to 22a, see M.R.]

Subp. 23. **Vinyl Chloride.**

CAS number: 75-01-4

Year Adopted: ~~2009~~ 2018

Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	ND	80 <u>90</u>	10	0.2
RfD (mg/kg-day)	--	--	0.03 <u>0.033</u>	0.003 <u>0.0030</u>	--
RSC	--	--	0.2	0.2	--
SF (per mg/kg-day)	--	--	--	--	1.4
AF_{lifetime}	--	--	--	--	1

Intake Rate (L/kg-day)	--	--	0.077 <u>0.070</u>	0.043 <u>0.044</u>	0.043 <u>0.044</u>
Endpoints	--	--	hepatic (liver) system	hepatic (liver) system	cancer

[For text of subps 23a and 24, see M.R.]

REPEALER. Minnesota Rules, part 4717.7500, subparts 2, 45, 51, 53, and 75, are repealed.