

Office of the Revisor of Statutes

Administrative Rules



TITLE: Adopted Permanent Rules Relating to Health Risk Limits

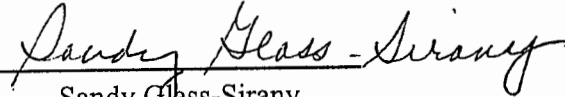
AGENCY: Minnesota Department of Health

REVISOR ID: R-4396

MINNESOTA RULES: Chapter 4717



The attached rules are approved for
filing with the Secretary of State


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190303

1.1 **Minnesota Department of Health**1.2 **Adopted Permanent Rules Relating to Health Risk Limits**1.3 **4717.7500 TABLE OF HEALTH RISK LIMITS.**1.4 Subpart 1. **Generally.** This part contains the table of the health risk limits.

1.5	CAS RN	RfD* (milligrams per	Slope factor* (the	Health Risk
1.6		kilogram per day)	inverse of milligrams	Limit
1.7			per kilogram per day)	(micrograms
1.8				per liter)

1.9 Subp. 2. [See repealer.]

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

1.11 Subp. 45. [See repealer.]

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

1.13 Subp. 51. [See repealer.]

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

1.15 Subp. 53. [See repealer.]

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

1.17 Subp. 75. [See repealer.]

1.18 *[For text of subps 76 to 90, see M.R.]*1.19 **4717.7860 HEALTH RISK LIMITS TABLE.**1.20 *[For text of subp 1, see M.R.]*1.21 Subp. 2. **Explanation of table in this part.**

1.22 A. "--" symbol means not relevant.

1.23 *[For text of items B to E, see M.R.]*

2.1 Subp. 2a. **Acenaphthene.**

2.2 CAS number: 83-32-9

2.3 Year Adopted: 2018

2.4 Volatility: Moderate

2.5		Acute	Short-term	Subchronic	Chronic	Cancer
2.6	HRL (µg/L)	ND	ND	200	100	NA
2.7	RfD	--	--	0.070	0.021	--
2.8	(mg/kg-day)					
2.9	RSC	--	--	0.2	0.2	--
2.10	SF (per	--	--	--	--	--
2.11	mg/kg-day)					
2.12	ADAF or	--	--	--	--	--
2.13	AF_{lifetime}					
2.14	Intake Rate	--	--	0.070	0.044	--
2.15	(L/kg-day)					
2.16	Endpoints	--	--	adrenal, hepatic	adrenal, hepatic	--
2.17				(liver) system	(liver) system	

2.18 Subp. 2b. **Acetaminophen.**

2.19 CAS number: 103-90-2

2.20 Year Adopted: 2015

2.21 Volatility: Nonvolatile

2.22		Acute	Short-term	Subchronic	Chronic	Cancer
2.23	HRL (µg/L)	200	200	200 (2)	200 (2)	NA
2.24	RfD	0.25	0.25	(2)	(2)	--
2.25	(mg/kg-day)					
2.26	RSC	0.2	0.2	(2)	(2)	--
2.27	SF (per	--	--	--	--	--
2.28	mg/kg-day)					

3.1	ADAF or	--	--	--	--
3.2	AF_{lifetime}				
3.3	Intake Rate	0.289	0.289	(2)	(2)
3.4	(L/kg-day)				--
3.5	Endpoints	hepatic (liver)	hepatic (liver)	hepatic (liver)	hepatic (liver)
3.6		system	system	system	system

3.7 Subp. 3. **Acetochlor.**

3.8 CAS number: 34256-82-1

3.9 Year Adopted: 2018

3.10 Volatility: Nonvolatile

3.11		Acute	Short-term	Subchronic	Chronic	Cancer
3.12	HRL (µg/L)	ND	30	30	20	NA
3.13	RfD	--	0.016	0.012	0.0039	--
3.14	(mg/kg-day)					
3.15	RSC	--	0.5	0.2	0.2	--
3.16	SF (per	--	--	--	--	--
3.17	mg/kg-day)					
3.18	ADAF or	--	--	--	--	--
3.19	AF_{lifetime}					
3.20	Intake Rate	--	0.285	0.070	0.044	--
3.21	(L/kg-day)					
3.22	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	--
3.23						
3.24						
3.25						
3.26						
3.27						
3.28						
3.29						
3.30						

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

4.2 CAS number: 187022-11-3

4.3 Year Adopted: 2018

4.4 Volatility: Nonvolatile

4.5		Acute	Short-term	Subchronic	Chronic	Cancer
4.6	HRL (µg/L)	ND	500	500	300	NA
4.7	RfD	--	0.29	0.19	0.056	--
4.8	(mg/kg-day)					
4.9	RSC	--	0.5	0.2	0.2	--
4.10	SF (per	--	--	--	--	--
4.11	mg/kg-day)					
4.12	ADAF or	--	--	--	--	--
4.13	AF_{lifetime}					
4.14	Intake Rate	--	0.285	0.070	0.044	--
4.15	(L/kg-day)					
4.16	Endpoints	--	thyroid (E)	male	male	--
4.17				reproductive	reproductive	
4.18				system, thyroid	system, thyroid	
4.19				(E)	(E)	

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

4.21 CAS number: 184992-44-4

4.22 Year Adopted: 2018

4.23 Volatility: Nonvolatile

4.24		Acute	Short-term	Subchronic	Chronic	Cancer
4.25	HRL (µg/L)	ND	100	100 (2)	90	NA
4.26	RfD	--	0.081	(2)	0.019	--
4.27	(mg/kg-day)					
4.28	RSC	--	0.5	(2)	0.2	--

5.1	SF (per	--	--	--	--	--
5.2	mg/kg-day)					
5.3	ADAF or	--	--	--	--	--
5.4	AF_{lifetime}					
5.5	Intake Rate	--	0.285	(2)	0.044	--
5.6	(L/kg-day)					
5.7	Endpoints	--	thyroid (E)	thyroid (E)	thyroid (E)	--

5.8 *[For text of subps 3c to 3e, see M.R.]*

5.9 **Subp. 4. Alachlor.**

5.10 CAS number: 15972-60-8

5.11 Year Adopted: 2018

5.12 Volatility: Nonvolatile

5.13		Acute	Short-term	Subchronic	Chronic	Cancer
5.14	HRL (µg/L)	ND	100	60	9	NA
5.15	RfD	--	0.077	0.020	0.0020	--
5.16	(mg/kg-day)					
5.17	RSC	--	0.5	0.2	0.2	--
5.18	SF (per	--	--	--	--	--
5.19	mg/kg-day)					
5.20	ADAF or	--	--	--	--	--
5.21	AF_{lifetime}					
5.22	Intake Rate	--	0.285	0.070	0.044	--
5.23	(L/kg-day)					
5.24	Endpoints	--	developmental, renal (kidney) system	hematological (blood) system, hepatic (liver) system, renal (kidney) system	hematological (blood) system, hepatic (liver) system, renal (kidney) system	--
5.25						
5.26						
5.27						
5.28						

5.29 *[For text of subps 5 to 6g, see M.R.]*

6.1 Subp. 7. **Chloroform.**

6.2 CAS number: 67-66-3

6.3 Year Adopted: 2018

6.4 Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer
6.5 HRL (µg/L)	ND	20	20 (2)	20 (2)	NA
6.6 RfD	--	0.022	(2)	(2)	--
6.7 (mg/kg-day)					
6.8 RSC	--	0.2	(2)	(2)	--
6.9 SF (per	--	--	--	--	--
6.10 mg/kg-day)					
6.11 ADAF or	--	--	--	--	--
6.12 AF _{lifetime}					
6.13 Intake Rate	--	0.285	(2)	(2)	--
6.14 (L/kg-day)					
6.15 Endpoints	--	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	developmental, hepatic (liver) system, immune system	--

6.20 Subp. 7a. **Clothianidin.**

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

6.22 Year Adopted: 2018

6.23 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer
6.24 HRL (µg/L)	ND	200	200 (2)	200 (2)	NA
6.25 RfD	--	0.093	(2)	(2)	--
6.26 (mg/kg-day)					
6.27 RSC	--	0.5	(2)	(2)	--

7.1	SF (per	--	--	--	--	--
7.2	mg/kg-day)					
7.3	ADAF or	--	--	--	--	--
7.4	AF_{lifetime}					
7.5	Intake Rate	--	0.285	(2)	(2)	--
7.6	(L/kg-day)					
7.7	Endpoints	--	developmental	developmental	developmental	--

7.8 Subp. 8. **Cyanazine.**

7.9 CAS number: 21725-46-2

7.10 Year Adopted: 2018

7.11 Volatility: Nonvolatile

7.12		Acute	Short-term	Subchronic	Chronic	Cancer
7.13	HRL (µg/L)	3	3	3	1	NA
7.14	RfD	0.0015	0.0015	0.0012	0.00022	--
7.15	(mg/kg-day)					
7.16	RSC	0.5	0.5	0.2	0.2	--
7.17	SF (per	--	--	--	--	--
7.18	mg/kg-day)					
7.19	ADAF or	--	--	--	--	--
7.20	AF_{lifetime}					
7.21	Intake Rate	0.285	0.285	0.070	0.044	--
7.22	(L/kg-day)					
7.23	Endpoints	developmental,	developmental,	developmental,	None	--
7.24		female	female	female		
7.25		reproductive	reproductive	reproductive		
7.26		system	system	system,		
7.27				hepatic (liver)		
7.28				system, renal		
7.29				(kidney)		
7.30				system		

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

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

8.3 CAS number: 156-59-2

8.4 Year Adopted: 2018

8.5 Volatility: High

8.6		Acute	Short-term	Subchronic	Chronic	Cancer
8.7	HRL (µg/L)	ND	20	10	6	NA
8.8	RfD	--	0.033	0.0043	0.0013	--
8.9	(mg/kg-day)					
8.10	RSC	--	0.2	0.2	0.2	--
8.11	SF (per	--	--	--	--	--
8.12	mg/kg-day)					
8.13	ADAF or	--	--	--	--	--
8.14	AF _{lifetime}					
8.15	Intake Rate	--	0.285	0.070	0.044	--
8.16	(L/kg-day)					
8.17	Endpoints	--	hepatic (liver)	renal (kidney)	renal (kidney)	--
8.18			system	system	system	

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

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

8.21 CAS number: 94-75-7

8.22 Year Adopted: 2018

8.23 Volatility: Nonvolatile

8.24		Acute	Short-term	Subchronic	Chronic	Cancer
8.25	HRL (µg/L)	ND	30	30 (2)	30 (2)	NA
8.26	RfD	--	0.048	(2)	(2)	--
8.27	(mg/kg-day)					

9.1	RSC	--	0.2	(2)	(2)	--
9.2	SF (per	--	--	--	--	--
9.3	mg/kg-day)					
9.4	ADAF or	--	--	--	--	--
9.5	AF _{lifetime}					
9.6	Intake Rate	--	0.285	(2)	(2)	--
9.7	(L/kg-day)					
9.8	Endpoints	--	adrenal,	adrenal,	adrenal,	--
9.9			developmental,	developmental,	developmental,	
9.10			thyroid (E)	thyroid (E)	thyroid (E)	

9.11 Subp. 11. Dieldrin.

9.12 CAS number: 60-57-1

9.13 Year Adopted: 2018

9.14 Volatility: Nonvolatile

9.15		Acute	Short-term	Subchronic	Chronic	Cancer
9.16	HRL (µg/L)	ND	0.2	0.2 (2)	0.2	0.006
9.17	RfD	--	0.00011	(2)	0.000043	--
9.18	(mg/kg-day)					
9.19	RSC	--	0.5	(2)	0.2	--
9.20	SF (per	--	--	--	--	16
9.21	mg/kg-day)					
9.22	AF _{lifetime}	--	--	--	--	2.5
9.23	Intake Rate	--	0.285	(2)	0.044	0.044
9.24	(L/kg-day)					
9.25	Endpoints	--	developmental,	developmental,	developmental,	cancer
9.26			immune system,	immune system,	hepatic (liver)	
9.27			nervous system	nervous system	system, immune	
9.28					system, nervous	
9.29					system	

9.30 [For text of subps 11a to 11e, see M.R.]

10.1 Subp. 11f. **Dinoseb.**

10.2 CAS number: 88-85-7

10.3 Year Adopted: 2018

10.4 Volatility: Moderate

10.5		Acute	Short-term	Subchronic	Chronic	Cancer
10.6	HRL (µg/L)	ND	8	8 (2)	8 (2)	NA
10.7	RfD	--	0.0048	(2)	(2)	--
10.8	(mg/kg-day)					
10.9	RSC	--	0.5	(2)	(2)	--
10.10	SF (per	--	--	--	--	--
10.11	mg/kg-day)					
10.12	ADAF or	--	--	--	--	--
10.13	AF_{lifetime}					
10.14	Intake Rate	--	0.285	(2)	(2)	--
10.15	(L/kg-day)					
10.16	Endpoints	--	developmental	developmental	developmental	--

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

10.18 CAS number: 123-91-1

10.19 Year Adopted: 2013

10.20 Volatility: Low

10.21		Acute	Short-term	Subchronic	Chronic	Cancer
10.22	HRL (µg/L)	ND	ND	300	100	1
10.23	RfD	--	--	0.12	0.025	--
10.24	(mg/kg-day)					
10.25	RSC	--	--	0.2	0.2	--
10.26	SF (per	--	--	--	--	0.1
10.27	mg/kg-day)					

11.1	ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2})
11.2						
11.3						3 (ADAF _{2 to <16})
11.4						1 (ADAF ₁₆₊)
11.5	Intake Rate (L/kg-day)	--	--	0.077	0.043	0.137 (_{<2})
11.6						0.047 (_{2 to <16})
11.7						0.039 (₁₆₊)
11.8	Endpoints	--	--	hepatic (liver)	hepatic (liver)	cancer
11.9				system, renal	system, renal	
11.10				(kidney)	(kidney)	
11.11				system,	system,	
11.12				respiratory	respiratory	
11.13				system	system	

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

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

11.16 CAS number: 759-94-4

11.17 Year Adopted: 2018

11.18 Volatility: Moderate

11.19		Acute	Short-term	Subchronic	Chronic	Cancer
11.20	HRL (µg/L)	300	300	90	40	NA
11.21	RfD (mg/kg-day)	0.16	0.16	0.033	0.0083	--
11.22						
11.23	RSC	0.5	0.5	0.2	0.2	--
11.24	SF (per mg/kg-day)	--	--	--	--	--
11.25						
11.26	ADAF or AF_{lifetime}	--	--	--	--	--
11.27						

12.1	Intake Rate (L/kg-day)	0.285	0.285	0.070	0.044	--
12.2						
12.3	Endpoints	nervous system	developmental,	cardiovascular	cardiovascular	--
12.4			female	system	system	
12.5			reproductive			
12.6			system, nervous			
12.7			system			

12.8 Subp. 12c. **Ethylene glycol.**

12.9 CAS number: 107-21-1

12.10 Year Adopted: 2011

12.11 Volatility: Nonvolatile

12.12		Acute	Short-term	Subchronic	Chronic	Cancer
12.13	HRL (µg/L)	4,000	4,000	2,000	2,000	NA
12.14	RfD (mg/kg-day)	0.76	0.76	0.72	0.50	--
12.15						
12.16	RSC	0.2	0.2	0.2	0.2	--
12.17	SF (per mg/kg-day)	--	--	--	--	--
12.18						
12.19	ADAF or AF_{lifetime}	--	--	--	--	--
12.20						
12.21	Intake Rate (L/kg-day)	0.043	0.043	0.077	0.043	--
12.22						
12.23	Endpoints	developmental	developmental	renal (kidney)	renal (kidney)	--
12.24				system,	system,	
12.25				developmental	developmental	

12.26 Subp. 12d. **Fluoranthene.**

12.27 CAS number: 206-44-0

12.28 Year Adopted: 2018

12.29 Volatility: Low

13.1		Acute	Short-term	Subchronic	Chronic	Cancer
13.2	HRL (µg/L)	ND	ND	200	70	NA
13.3	RfD	--	--	0.053	0.016	--
13.4	(mg/kg-day)					
13.5	RSC	--	--	0.2	0.2	--
13.6	SF (per	--	--	--	--	--
13.7	mg/kg-day)					
13.8	ADAF or	--	--	--	--	--
13.9	AF_{lifetime}					
13.10	Intake Rate	--	--	0.070	0.044	--
13.11	(L/kg-day)					
13.12	Endpoints	--	--	hepatic (liver)	hepatic (liver)	--
13.13				system, renal	system, renal	
13.14				(kidney) system	(kidney) system	

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

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

13.17 Year Adopted: 2011

13.18 Volatility: Nonvolatile

13.19		Acute	Short-term	Subchronic	Chronic	Cancer
13.20	HRL (µg/L)	400	400	300	300 (3)	NA
13.21	RfD	0.24	0.24	0.097	(3)	--
13.22	(mg/kg-day)					
13.23	RSC	0.5	0.5	0.2	(3)	--
13.24	SF (per	--	--	--	--	--
13.25	mg/kg-day)					
13.26	ADAF or	--	--	--	--	--
13.27	AF_{lifetime}					

14.1	Intake Rate	0.289	0.289	0.077	(3)	--
14.2	(L/kg-day)					
14.3	Endpoints	developmental	developmental	none	none	--

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

14.5 CAS number: 171118-09-5

14.6 Year Adopted: 2011

14.7 Volatility: Nonvolatile

14.8		Acute	Short-term	Subchronic	Chronic	Cancer
14.9	HRL (µg/L)	ND	ND	4,000	800	NA
14.10	RfD	--	--	1.7	0.17	--
14.11	(mg/kg-day)					
14.12	RSC	--	--	0.2	0.2	--
14.13	SF (per	--	--	--	--	--
14.14	mg/kg-day)					
14.15	ADAF or	--	--	--	--	--
14.16	AF_{lifetime}					
14.17	Intake Rate	--	--	0.077	0.043	--
14.18	(L/kg-day)					
14.19	Endpoints	--	--	hepatic (liver)	hepatic (liver)	--
14.20				system	system	

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

14.22 CAS number: 152019-73-3

14.23 Year Adopted: 2011

14.24 Volatility: Nonvolatile

14.25		Acute	Short-term	Subchronic	Chronic	Cancer
14.26	HRL (µg/L)	ND	3,000	3,000 (2)	800	NA

15.1	RfD	--	1.7	(2)	0.17	--
15.2	(mg/kg-day)					
15.3	RSC	--	0.5	(2)	0.2	--
15.4	SF (per	--	--	--	--	--
15.5	mg/kg-day)					
15.6	ADAF or	--	--	--	--	--
15.7	AF_{lifetime}					
15.8	Intake Rate	--	0.289	(2)	0.043	--
15.9	(L/kg-day)					
15.10	Endpoints	--	none	none	none	--

15.11 Subp. 12h. **Metribuzin.**

15.12 CAS number: 21087-64-9

15.13 Year Adopted: 2013

15.14 Volatility: Low

15.15		Acute	Short-term	Subchronic	Chronic	Cancer
15.16	HRL (µg/L)	30	10	10 (2)	10 (2)	NA
15.17	RfD	0.016	0.006	(2)	(2)	--
15.18	(mg/kg-day)					
15.19	RSC	0.5	0.5	(2)	(2)	--
15.20	SF (per	--	--	--	--	--
15.21	mg/kg-day)					
15.22	ADAF or	--	--	--	--	--
15.23	AF_{lifetime}					
15.24	Intake Rate	0.289	0.289	(2)	(2)	--
15.25	(L/kg-day)					
15.26	Endpoints	developmental, nervous system	thyroid (E)	thyroid (E)	thyroid (E)	--
15.27						

16.1 Subp. 12i. **Naphthalene.**

16.2 CAS number: 91-20-3

16.3 Year Adopted: 2013

16.4 Volatility: Moderate

16.5		Acute	Short-term	Subchronic	Chronic	Cancer
16.6	HRL (µg/L)	70	70	70 (2)	70	NA
16.7	RfD	0.038	0.038	(2)	0.016	--
16.8	(mg/kg-day)					
16.9	RSC	0.5	0.5	(2)	0.2	--
16.10	SF (per	--	--	--	--	--
16.11	mg/kg-day)					
16.12	ADAF or	--	--	--	--	--
16.13	AF_{lifetime}					
16.14	Intake Rate	0.289	0.289	(2)	0.043	--
16.15	(L/kg-day)					
16.16	Endpoints	nervous system	nervous system	nervous system	nervous system,	--
16.17					spleen	

16.18 *[For text of subps 13 to 14a, see M.R.]*16.19 Subp. 14b. **Perfluorobutyrate Perfluorobutanoate (PFBA).**16.20 CAS number: 45048-62-2; 375-22-4

16.21 Year Adopted: 2018

16.22 Volatility: Nonvolatile

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

17.1	17.2	SF (per mg/kg-day)	--	--	--	--	--
17.3	17.4	ADAF or AF_{lifetime}	--	--	--	--	--
17.5	17.6	Intake Rate (L/kg-day)	--	0.285	(2)	(2)	--
17.7	17.8	Endpoints	--	hepatic (liver) system, thyroid (E)	hepatic (liver) system, thyroid (E)	hepatic (liver) system, thyroid (E)	--

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

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

17.13 Year Adopted: ~~2018~~ 2009

17.14 Volatility: Nonvolatile

17.15		Acute	Short-term	Subchronic	Chronic	Cancer
17.16	HRL (µg/L)	ND	0.027	0.027	0.027	NA
17.17			<u>ND</u>	<u>ND</u>	<u>0.3</u>	
17.18	RfD	--	0.0000051	0.0000051	0.0000051	--
17.19	(mg/kg-day)		--	--	<u>0.00008</u>	
17.20	RSC	--	0.5	0.5	0.5	--
17.21			--	--	<u>0.2</u>	
17.22	SF (per mg/kg-day)	--	--	--	--	--
17.24	ADAF or AF_{lifetime}	--	--	--	--	--
17.25						
17.26	Intake Rate	--	*	*	*	--
17.27	(L/kg-day)		--	--	<u>0.049</u>	
17.28	Endpoints	--	developmental, hepatic (liver) system, immune	developmental, hepatic (liver) system, immune	developmental, hepatic (liver) system, immune	--
17.29						
17.30						

18.1		system, thyroid	system, thyroid	system, thyroid	
18.2		(E) --	(E) --	(E)	

18.3 ~~* 95th percentile water intake rates (Tables 3-1 and 3-3), or upper percentile breast milk~~
 18.4 ~~intake rates (Table 15-1), Environmental Protection Agency (EPA) Exposure Factors~~
 18.5 ~~Handbook, 2011.~~

18.6 Subp. 16. **Perfluorooctanoic acid** Perfluorooctanoate (PFOA) and salts.

18.7 CAS number: 45285-51-6; 335-67-1; 335-66-0; 3825-26-1; 2395-00-8;
 18.8 335-93-3; and 335-95-5

18.9 Year Adopted: 2018

18.10 Volatility: Nonvolatile

18.11		Acute	Short-term	Subchronic	Chronic	Cancer
18.12	HRL (µg/L)	ND	0.035	0.035	0.035	NA
18.13	RfD	--	0.000018	0.000018	0.000018	--
18.14	(mg/kg-day)					
18.15	RSC	--	0.5	0.5	0.5	--
18.16	SF (per	--	--	--	--	--
18.17	mg/kg-day)					
18.18	ADAF or	--	--	--	--	--
18.19	AF_{lifetime}					
18.20	Intake Rate	--	*	*	*	--
18.21	(L/kg-day)					
18.22	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	--
18.23						
18.24						
18.25						
18.26						
18.27						
18.28						

19.1 * 95th percentile water intake rates (Tables 3-1 and 3-3), or upper percentile breast milk
 19.2 intake rates (Table 15-1), Environmental Protection Agency (EPA) Exposure Factors
 19.3 Handbook, 2011.

19.4 Subp. 16a. **Pyrene.**

19.5 CAS number: 129-00-0

19.6 Year Adopted: 2018

19.7 Volatility: Moderate

19.8		Acute	Short-term	Subchronic	Chronic	Cancer
19.9	HRL (µg/L)	ND	ND	90	50	NA
19.10	RfD	--	--	0.033	0.010	--
19.11	(mg/kg-day)					
19.12	RSC	--	--	0.2	0.2	--
19.13	SF (per	--	--	--	--	--
19.14	mg/kg-day)					
19.15	ADAF or	--	--	--	--	--
19.16	AF_{lifetime}					
19.17	Intake Rate	--	--	0.070	0.044	--
19.18	(L/kg-day)					
19.19	Endpoints	--	--	renal (kidney)	renal (kidney)	--
19.20				system	system	

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

19.22 Subp. 18a. **Tetrahydrofuran.**

19.23 CAS number: 109-99-9

19.24 Year Adopted: 2018

19.25 Volatility: Moderate

20.1		Acute	Short-term	Subchronic	Chronic	Cancer
20.2	HRL (µg/L)	ND	600	600 (2)	600 (2)	NA
20.3	RfD	--	0.82	(2)	(2)	--
20.4	(mg/kg-day)					
20.5	RSC	--	0.2	(2)	(2)	--
20.6	SF (per	--	--	--	--	--
20.7	mg/kg-day)					
20.8	ADAF or	--	--	--	--	--
20.9	AF_{lifetime}					
20.10	Intake Rate	--	0.285	(2)	(2)	--
20.11	(L/kg-day)					
20.12	Endpoints	--	developmental	developmental	developmental	--

20.13 Subp. 18b. **Thiamethoxam.**

20.14 CAS number: 153719-23-4

20.15 Year Adopted: 2018

20.16 Volatility: Nonvolatile

20.17		Acute	Short-term	Subchronic	Chronic	Cancer
20.18	HRL (µg/L)	ND	400	200	200 (3)	NA
20.19	RfD	--	0.25	0.057	(3)	--
20.20	(mg/kg-day)					
20.21	RSC	--	0.5	0.2	(3)	--
20.22	SF (per	--	--	--	--	--
20.23	mg/kg-day)					
20.24	ADAF or	--	--	--	--	--
20.25	AF_{lifetime}					

21.1	Intake Rate	--	0.285	0.070	(3)	--
21.2	(L/kg-day)					
21.3	Endpoints	--	developmental,	male	male	--
21.4			female	reproductive	reproductive	
21.5			reproductive	system	system	
21.6			system, hepatic			
21.7			(liver) system			

21.8 Subp. 18c. **Toluene.**

21.9 CAS number: 108-88-3

21.10 Year Adopted: 2011

21.11 Volatility: High

21.12		Acute	Short-term	Subchronic	Chronic	Cancer
21.13	HRL (µg/L)	ND	200	200 (2)	200 (2)	NA
21.14	RfD	--	0.22	(2)	(2)	--
21.15	(mg/kg-day)					
21.16	RSC	--	0.2	(2)	(2)	--
21.17	SF (per	--	--	--	--	--
21.18	mg/kg-day)					
21.19	ADAF or	--	--	--	--	--
21.20	AF_{lifetime}					
21.21	Intake Rate	--	0.289	(2)	(2)	--
21.22	(L/kg-day)					
21.23	Endpoints	--	immune system,	immune system,	immune system,	--
21.24			nervous system	nervous system	nervous system	

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

21.26 CAS number: 120-82-1

21.27 Year Adopted: 2013

21.28 Volatility: High

22.1		Acute	Short-term	Subchronic	Chronic	Cancer
22.2	HRL (µg/L)	ND	100	100 (2)	100	4
22.3	RfD	--	0.17	(2)	0.021	--
22.4	(mg/kg-day)					
22.5	RSC	--	0.2	(2)	0.2	--
22.6	SF (per	--	--	--	--	0.029
22.7	mg/kg-day)					
22.8	ADAF or	--	--	--	--	10 (ADAF _{<2})
22.9	AF_{lifetime}					3 (ADAF _{2 to <16})
22.10						1 (ADAF ₁₆₊)
22.11						
22.12	Intake Rate	--	0.289	(2)	0.043	0.137 (<2)
22.13	(L/kg-day)					0.047 (2 to <16)
22.14						0.039 (16+)
22.15	Endpoints	--	hepatic (liver)	hepatic (liver)	hepatic (liver)	cancer
22.16			system,	system,	system,	
22.17			adrenal (E),	adrenal (E),	adrenal (E),	
22.18			hemato-	hemato-	renal (kidney)	
22.19			logical	logical	system	
22.20			(blood)	(blood)		
22.21			system	system		

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

22.23 CAS number: 71-55-6

22.24 Year Adopted: 2018

22.25 Volatility: High

22.26		Acute	Short-term	Subchronic	Chronic	Cancer
22.27	HRL (µg/L)	ND	ND	9,000	5,000	NA
22.28	RfD	--	--	3.0	1.0	--
22.29	(mg/kg-day)					

23.1	RSC	--	--	0.2	0.2	--
23.2	SF (per	--	--	--	--	--
23.3	mg/kg-day)					
23.4	ADAF or	--	--	--	--	--
23.5	AF_{lifetime}					
23.6	Intake Rate	--	--	0.070	0.044	--
23.7	(L/kg-day)					
23.8	Endpoints	--	--	hepatic (liver)	hepatic (liver)	--
23.9				system, male	system, male	
23.10				reproductive	reproductive	
23.11				system	system	

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

23.13 **Subp. 23. Vinyl Chloride.**

23.14 CAS number: 75-01-4

23.15 Year Adopted: 2018

23.16 Volatility: High

23.17		Acute	Short-term	Subchronic	Chronic	Cancer
23.18	HRL (µg/L)	ND	ND	90	10	0.2
23.19	RfD	--	--	0.033	0.0030	--
23.20	(mg/kg-day)					
23.21	RSC	--	--	0.2	0.2	--
23.22	SF (per	--	--	--	--	1.4
23.23	mg/kg-day)					
23.24	AF_{lifetime}	--	--	--	--	1
23.25	Intake Rate	--	--	0.070	0.044	0.044
23.26	(L/kg-day)					
23.27	Endpoints	--	--	hepatic (liver)	hepatic	cancer
23.28				system	(liver) system	

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

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

August 6, 2018

VIA EMAIL ONLY

Nancy Breems
Secretary of State, Elections Division
180 State Office Building
100 Rev Dr Martin Luther King Jr Blvd
St. Paul, Minnesota 55155-1299
official.documents@state.mn.us

**Re: *In the Matter of the Proposed Rules of the Department of Health
Relating to Health Risk Limits for Groundwater*
OAH 82-9000-34834; Revisor 4396**

Dear Ms. Breems:

Enclosed for filing is an electronic copy of the above-entitled adopted rules.

Please send the agency copy of the rules to:

Nancy Rice
Health Risk Assessment Unit
PO Box 64975
Saint Paul, MN 55164
nancy.rice@state.mn.us

If you have any questions regarding this matter, please contact Katie Lin at (651) 361-7911 or katie.lin@state.mn.us.

Sincerely,

/s/ Lisa Armstrong

Lisa Armstrong

Enclosures

cc: Nancy Rice (via email)