

## OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

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Chemical Name: RDX (Hexahydro-1,3,5-Trinitro-1,3,5-Triazine) Developed by: Chris J. SkalskiCAS # 121-82-4 Data Retrieval Date: 12-06-01Internal Code # --- Fact Sheet Preparation Date: 3-01-06ACUTE DATA

<u>SPECIES</u>	<u>EC<sub>50</sub>/LC<sub>50</sub></u> <u>(µg/l)</u>	<u>TEST TYPE<sup>a</sup></u>	<u>DURATION</u> <u>(HOURS)</u>	<u>SMAV<sup>b</sup></u> <u>(µg/l)</u>	<u>GMAV<sup>b</sup></u> <u>(µg/l)</u>	<u>REFERENCE</u> <u>NUMBER</u>
Cladoceran <i>Daphnia magna</i>	>15,000	S,U	48	>15,000	>15,000	1
Midge <i>Chironomus tentans</i>	>15,000	S,U	96	>15,000	>15,000	1
Channel Catfish <i>Ictalurus punctatus</i>	13,000 4,100	F,M S,U	96 96	13,000	13,000	1 1
Bluegill <i>Lepomis macrochirus</i>	4,800 7,600 3,700 3,900 4,800 5,100 4,800 4,100 3,800 5,300 3,900 3,600 8,400 5,100 6,000	S,M F,M S,M S,M S,M S,M S,M S,M S,M S,M S,M S,M S,M S,M S,M	96 96 96 96 96 96 96 96 96 96 96 96 96 96 96	7,600	7,600	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Rainbow Trout <i>Oncorhynchus mykiss</i>	6,400	S,M	96	6,400	6,400	1
Fathead Minnow <i>Pimephales promelas</i>	6,600 11,000 3,800 16,000 5,800 43,000 12,700	F,M S,M S,M S,M S,M S,M F,M	96 96 96 96 96 96 96	9,155	9,155	1 1 1 1 1 1 2

<sup>a</sup> S = static; F= flow through; U = unmeasured; M = measured.<sup>b</sup> SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.

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### CHRONIC DATA

<u>SPECIES</u>	<u>CHRONIC VALUE</u> ( <u>µg/l</u> )	<u>SMCV<sup>a</sup></u> <u>METHOD</u>	<u>GMCV<sup>a</sup></u> ( <u>µg/l</u> )	<u>REFERENCE</u> ( <u>µg/l</u> )	<u>NUMBER</u>
Cladoceran <i>Ceriodaphnia dubia</i>	3,640-6,010 4,677	Life Cycle	4,677	4,677	3
Fathead Minnow <i>Pimephales promelas</i>	1,350-2,360 1,785	Early Life Stage	1,785	1,785	2

<sup>a</sup> SMCV = Species Mean Chronic Value; GMCV = Genus Mean Chronic Value.

### REFERENCES

1. Bentley, R.E., J.W. Dean, S.J. Ells, T.A. Hollister, G.A. LeBlanc, S. Sauter and B.H. Sleight. 1977. Laboratory Evaluation of the Toxicity of Cyclotrimethylene Trinitramine (RDX) to Aquatic Organisms. U.S. Army Medical Research Development Command, Frederick, MD:86 p.
2. Burton, D.T., S.D. Turley and G.T. Peters. 1994. The Acute and Chronic Toxicity of Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) to the Fathead Minnow (*Pimephales promelas*). Chemosphere 29(3):567-579.
3. Peters, G.T., D.T. Burton, R.L. Paulson and S.D. Turley. 1991. The Acute and Chronic Toxicity of Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) to Three Freshwater Invertebrates. Environ. Toxicol. Chem. 10:1073-1081.

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<u>Data Requirement</u> <u>OAC 3745-1-36(A)(1)</u>	<u>SPECIES</u>	<u>GMAV</u> <u>(µg/l)</u>
(a)	Rainbow Trout	6,400
(b)	Bluegill	7,600
(c)	Fathead Minnow	9,155
(d)	<i>Daphnia magna</i>	>15,000
(f)	Midge	>15,000

Secondary Acute Factor (SAF) = 6.1

Secondary Acute Value (SAV) = Lowest GMAV ÷ SAF  
 = 6,400 ÷ 6.1  
 = 1,049 = 1,000 µg/l

Tier II Acute Aquatic Value (AAV) = SAV ÷ 2  
 = 1,049 ÷ 2  
 = 524.6 = 520 µg/l

CALCULATION OF CHRONIC AQUATIC VALUE (CAV)<sup>a</sup>

Experimentally determined Acute-Chronic Ratios (ACRs):

<u>SPECIES</u>	<u>ACUTE VALUE</u> <u>(µg/l)</u>	<u>CHRONIC VALUE</u> <u>(µg/l)</u>	<u>ACUTE-CHRONIC</u> <u>RATIO</u>	<u>SPECIES MEAN</u> <u>ACR</u>
Fathead Minnow	12,700	1,785	7.12	7.12
<i>Pimephales promelas</i>				

Secondary Acute-Chronic Ratio (SACR) =  $\sqrt[3]{(7.12)(18)(18)} = 13.21$

Chronic Aquatic Value (CAV) = SAV ÷ SACR  
 = 1,049 ÷ 13.21  
 = 79 µg/l

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<sup>a</sup> See Ohio Administrative Code 3745-1-36 effective February 22, 2002.