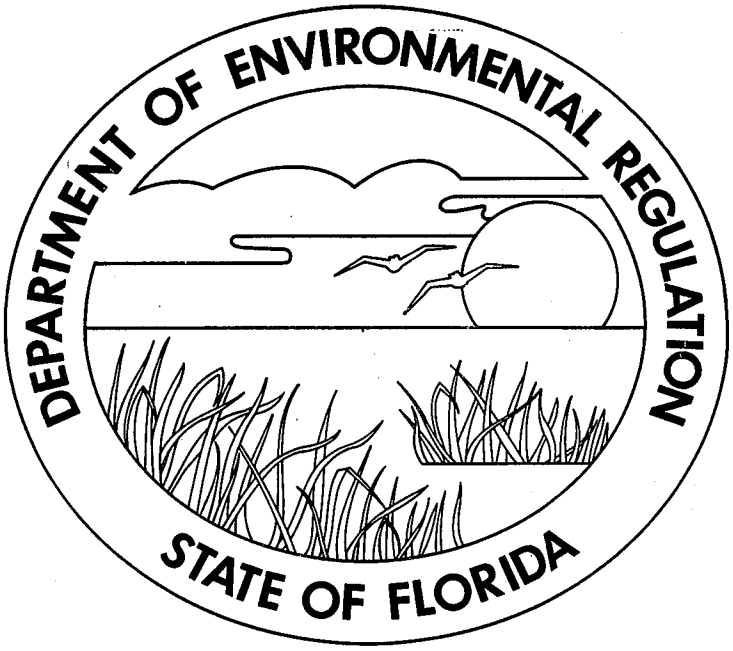
Kulakowski

# FLORIDA GROUND WATER GUIDANCE CONCENTRATIONS




Florida
Department of Environmental Regulation
February 1989

UPCOMING MEETING

¶ April 2-3, "OSHA Compliance Course," Arlington, Va. Call Government Institutes Inc. at 301/251-9250.

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THE CHART BELOW lists the drinking water standards set by the Environmental Protection Agency Dec. 31 (TMN, Jan. 9, 1991, p. 13). The maximum contaminant level (MCL) is legally enforceable, while the maximum contaminant level goal (MCLG) is not. The standards are listed in milligrams per liter (mg/l).

**Phase II National Primary Drinking Water Regulations**

| CONTAMINANT | EPA Standards (mg/l)[1] MCL | MCLG | CONTAMINANT | EPA Standards (mg/l)[1] MCL | MCLG |
|---|---|---|---|---|---|
| **Inorganics** | | | **Pesticides and PCBs** | | |
| Asbestos | 7 MFL[2] | 7 MFL[2] | Aldicarb sulfone[3] | 0.003 | 0.002 |
| Barium[3] | 2 | 2 | Aldicarb sulfoxide[3] | 0.003 | 0.001 |
| Cadmium | 0.005 | 0.005 | Atrazine (Atranex, Criszina) | 0.003 | 0.003 |
| Chromium | 0.1 | 0.1 | Carbofuran (Furadan 4F) | 0.04 | 0.04 |
| Mercury | 0.002 | 0.002 | Chlordane | 0.002 | 0 |
| Nitrate | 10 | 10 | Dibromochloropropane (DBCP, Nemafume) | 0.0002 | 0 |
| Nitrite | 1 | 1 | 2,4-D (Formula 40, Weedar 64) | 0.07 | 0.07 |
| Nitrate/Nitrite | 10 | 10 | Ethylene Dibromide (EDB, Bromofume) | 0.00005 | 0 |
| Selenium | 0.05 | 0.05 | Heptachlor (H-34, Heptox) | 0.0004 | 0 |
| **Volatile Organics** | | | Heptachlor epoxide | 0.0002 | 0 |
| o-Dichlorobenzene | 0.6 | 0.6 | Lindane | 0.0002 | 0.0002 |
| cis-1,2 dichloroethylene | 0.07 | 0.07 | Methoxychlor (DMDT, Marlate) | 0.04 | 0.04 |
| trans-1,2 dichloroethylene | 0.1 | 0.1 | Polychlorinated Biphenyls | 0.0005 | 0 |
| 1,2 Dichloropropane | 0.005 | 0 | Pentachlorophenol[3] | 0.001 | 0 |
| Ethylbenzene | 0.7 | 0.7 | Toxaphene | 0.003 | 0 |
| Monochlorobenzene | 0.1 | 0.1 | 2,4,5-TP (Silvex) | 0.05 | 0.05 |
| Styrene | 0.1 | 0.1 | | | |
| Tetrachloroethylene | 0.005 | 0 | | | |
| Toluene | 1 | 1 | | | |
| Xylenes | 10 | 10 | **Treatment Techniques** | | |
| | | | Acrylamide | 0.005% dosed at 1 mg/l | 0 |
| **Pesticides and PCBs** | | | Epichlorohydrin | 0.01% dosed at 20 mg/l | 0 |
| Alachlor (Lasso) | 0.002 | 0 | | | |
| Aldicarb[3] (Temik) | 0.003 | 0.001 | | | |

[1] Final MCLGs and MCLs become effective July 1992. At that time, the current MCLs cease to be effective. [2] MFL = million fibers per liter, with fiber length > 10 microns.
[3] Levels for barium, aldicarb, aldicarb sulfone, aldicarb sulfoxide and pentachlorophenol are proposed. Final levels will be established by July 1991.

END

lead ~~proposed~~ 15ug/l effective 6-6-91
Al as of 7-92 MCL 0.05-0.2 mg/l

**Proposed**

**U.S. Environmental Protection Agency**

**Primary and Secondary Drinking Water Standards**

**Maximum Contaminant Levels (MCLs)**

Proposed: July 25, 1990
Anticipated EPA Finalization: Fall 1991

I. Proposed Primary Drinking Water Standard MCLs:

| Parameter | Proposed MCL (μg/L)* |
|---|---|
| Antimony | 5 or 10 |
| Beryllium | 1 |
| Cyanide | 200 |
| Nickel | 100 |
| Sulfate | 400,000 or 500,000 |
| Thallium | 1 or 2 |
| Adipates [Di(ethylhexyl)adipate] | 500 |
| Dalaphon | 200 |
| Dichloromethane (methylene chloride) | 5 |
| Dinoseb | 7 |
| Diquat | 20 |
| Endothall | 100 |
| Endrin | 2 |
| Glyphosate | 700 |
| Hexachlorobenzene | 1 |
| Hexachlorocyclopentadiene (HEX) | 50 |
| Oxamyl (Vydate) | 200 |
| PAHs [Benzo(a)pyrene] | 0.2 |
| Phthalates [Di(ethylhexyl)phthalate] | 4 |
| Picloram | 500 |
| Simazine | 1 |
| 1,2,4-Trichlorobenzene | 9 |
| 1,1,2-Trichloroethane | 5 |
| 2,3,7,8-TCDD (Dioxin) | $5 \times 10^{-8}$ |

II. Proposed Secondary Drinking Water Standard MCLs:

| Parameter | Proposed MCL (μg/L)* |
|---|---|
| Hexachlorocyclopentadiene | 8 |

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* μg/L = micrograms per Liter (ppb)

**Proposed**

**U.S. Environmental Protection Agency**

**Primary and Secondary Drinking Water Standards**

**Maximum Contaminant Levels (MCLs)**

Proposed: May 22, 1989
Anticipated EPA Finalization: December 1990

I. Proposed Primary Drinking Water Standard MCLs:

| Parameter | Proposed MCL (µg/L)* |
|---|---|
| Asbestos | 7 million fibers / Liter |
| Barium | 5,000 |
| Cadmium | 5 |
| Chromium | 100 |
| Mercury | 2 |
| Nitrate[1] | 10,000 (as N) |
| Nitrite[1] | 1,000 (as N) |
| Selenium | 50 |
| Acrylamide | treatment technique |
| Alachlor | 2 |
| Aldicarb | 10 |
| Aldicarb sulfoxide | 10 |
| Aldicarb sulfone | 40 |
| Atrazine | 3 |
| Carbofuran | 40 |
| Chlordane | 2 |
| Dibromochloropropane (DBCP) | 0.2 |
| o-dichlorobenzene | 600 |
| cis-1,2-Dichloroethylene | 70 |
| trans-1,2-Dichloroethylene | 100 |
| 1,2-Dichloropropane | 5 |
| 2,4-D | 70 |
| Epichlorohydrin | treatment technique |
| Ethylbenzene | 700 |
| Ethylene dibromide (EDB) | 0.05 |
| Heptachlor | 0.4 |
| Heptachlor epoxide | 0.2 |
| Lindane | 0.2 |
| Methoxychlor | 400 |

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* µg/L = micrograms per Liter (ppb)
[1] In addition, MCL for total nitrate and nitrite = 10,000 µg/L (as N).

I. Proposed Primary Drinking Water Standard MCLs: (continued)

| Parameter | Proposed MCL (µg/L)* |
|---|---|
| Monochlorobenzene | 100 |
| Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl) | 0.5 |
| Pentachlorophenol | 200 |
| Styrene[2] | 5 |
| Styrene[3] | 100 |
| Tetrachloroethylene | 5 |
| Toluene | 2,000 |
| Toxaphene | 5 |
| 2,4,5-TP (Silvex) | 50 |
| Xylenes (total) | 10,000 |

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* µg/L = micrograms per Liter (ppb).
[2] EPA proposes a MCL of 5 µg/L for styrene based on a Group $B_2$ carcinogen classification.
[3] EPA proposes a MCL of 100 µg/L for styrene based on a Group C carcinogen classification.

II. Proposed Secondary Drinking Water Standard MCLs:

| Parameter | Proposed MCL (µg/L) |
|---|---|
| Aluminum | 50 |
| o-Dichlorobenzene | 10 |
| p-Dichlorobenzene | 5 |
| Ethylbenzene | 30 |
| Pentachlorophenol | 30 |
| Silver | 90 |
| Toluene | 40 |
| Xylenes (total) | 20 |

Since the drinking water program in Florida has been delegated by EPA to the state, once MCLs are finalized by EPA, they must then be adopted by the state. Adoption of Florida's drinking water standards is carried out by the Environmental Regulation Commission. Florida's drinking water standards must be at least as stringent as those promulgated by EPA.

Proposed 6-19-91 by EPA (MCLs)
radon 300 pCi/l = $2 \times 10^{-4}$ cancer risk

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

| For Routing To Other Than The Addressee | |
|---|---|
| To: | Location: |
| To: | Location: |
| To: | Location: |
| From: | Date: |

# Interoffice Memorandum

TO: Deputy Assistant Secretaries

Mr. Randall Armstrong, Director
Division of Water Management

Mr. Richard Wilkins, Director
Division of Waste Management

THROUGH: John S. Shearer, Assistant Secretary

FROM: Howard L. Rhodes, Director
Division of Water Facilities

DATE: February 7, 1989

SUBJECT: Update of the 1986 Ground Water Guidance Concentrations Table

The attached booklet, Ground Water Guidance Concentrations is an updated version of the table of ground water guidance concentrations originally distributed to DER district offices October 2, 1986. This booklet has the same purpose of the original table: guidance for district personnel in reviewing effluent and ground water quality data for Minimum Criteria requirements (Rule 17-3.402, F.A.C.). This booklet contains new and updated toxicological data and should be used in place of the 1986 table.

HLR/lq

Attachment

# GROUND WATER GUIDANCE CONCENTRATIONS

FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
Division of Water Facilities

Bureau of Ground Water Protection
Compiled by: Randy Merchant
February 1989

TABLE OF CONTENTS

# INTRODUCTION

A table of ground water guidance concentrations was distributed to all DER District Offices October 2, 1986 to provide guidance to District personnel in reviewing effluent and ground water quality data for Minimum Criteria requirements (Rule 17-3.402, F.A.C.). This booklet, Ground Water Guidance Concentrations is an update of that 1986 table, incorporating toxicological data that has become available since then. This updated version has the same purpose and format of the original table and should be used in its place.

Three significant sources of toxicological information have become available since the table was originally compiled in 1986: 50 pesticide Health Advisories from the EPA Office of Drinking Water, 45 Recommended Protective Concentrations (RPCs) proposed by the Center for Biomedical and Toxicological Research (CBTR) at Florida State University, and 26 new EPA proposed Maximum Contaminant Levels (MCLs). These three sources account for the majority of the new entries and updates to this booklet. The Appendix to this booklet elaborates on the procedures and priorities used to compile these sources. The resulting Guidance Concentrations were compared to other state guidelines and standards and were reviewed by Florida and EPA toxicologists.

The concentrations in this booklet are not standards and without adoption by the Environmental Regulation Commission can not be used as standards. These guidelines should be used to screen analytical chemical results so that concentrations above the Guidance Concentration will be given closer scrutiny. In permitting or enforcement cases an expert may be needed to verify the carcinogenicity or other human health hazards of contaminants above the Guidance Concentration. This booklet has been compiled from published research on human health risks from the direct consumption of ground water. These concentrations, however, may be modified in the future as new research becomes available and feedback is received.

The concentrations in this booklet are designed to apply to ground water only and should not be used for surface water applications. In cases where a significant ground water discharge to surface water is anticipated, a lower Guidance Concentration may be necessary due to the additional human exposure via consumption of contaminated fish and other aquatic organisms. A lower ground water Guidance Concentration may also be necessary to protect fish and aquatic organisms from direct toxic effects of a ground water to surface water discharge.

These ground water Guidance Concentrations are based on health effects and are not designed to be used as ground water clean-up goals, which may consider additional factors such as feasibility, existing technology, and costs. In some cases it may not feasible to remediate ground water to low level, health based concentrations.

The column "Detection Limit" in the original table has been modified to read "Practical Quantitation Level" in this booklet. This change more closely reflects the original intent to provide an estimate of the lowest concentration routinely quantifiable by most analytical laboratories. The concentrations under "Detection Limit"

in the original table were in some cases overly optimistic and were not obtainable on a routine basis. The Appendix to this booklet details the derivation of the Practical Quantitation Levels.

The Bureau of Ground Water Protection, UIC Criteria & Standards Section is prepared to assist in the interpretation and application of this information. Questions regarding this Ground Water Guidance Concentrations booklet should be directed to either Jim McNeal or Randy Merchant (904 488-3601, SC 278-3601).

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
GROUND WATER GUIDANCE CONCENTRATIONS*
FEBRUARY 1989

| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 83-32-9 | Acenaphthene | 20 | 10 | Organoleptic (AWQCD) |
| 208-96-8 | Acenaphthylene | 10 | 10 | PQL |
| 67-64-1 | Acetone 3650 | 700 | 5-10 A | IRIS |
| 5094-66-6 | Acifluorfen (Blazer) | 10 | 5-10 A | PQL / 1ug/L = $10^{-6}$ cancer risk (H.A.) |
| 107-02-8 | Acrolein (Propenal) | 110 | 5 | EPA PPCL |
| 79-06-1 | Acrylamide (2-Propeneamide) | 1 | 1 | PQL / 0.01ug/L=$10^{-6}$ cancer risk (CAG) |
| 107-13-1 | Acrylonitrile | 2.5 | 2.5 | PQL / 0.063ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 15972-60-8 | Alachlor | 1.5 | 1 | Lifetime Health Adv. |
| 116-06-3 | Aldicarb (Temik) | 10 | 5 | Lifetime Health Adv. |
| | Aldicarb sulfoxide | 10 | 5 | Lifetime Health Adv. |
| 1646-88-4 | Aldicarb sulfone | 40 ** | 5 | Lifetime Health Adv. |
| 309-00-2 | Aldrin | 0.05 | 0.05 | PQL / RPC= 0.013 ug/L |
| | Alpha, gross **** | 15 pCi/L | | Primary D.W. Standard |
| 834-12-8 | Ametryn | 60 | 5-10 A | Lifetime Health Adv. |
| 7773-06-0 | Ammonium sulfamate | 2,000 | 5-10 X | Lifetime Health Adv. |
| 120-12-7 | Anthracene | 10 | 10 | PQL |
| 7440-36-0 | Antimony | 29 | 20 | EPA PPCL (ADI) |
| | Arsenic **** | 50 | 5 | Primary D.W. Standard |
| 1332-21-4 | Asbestos *** | 7 million fibers/L | 0.1 million fibers/L | Proposed EPA MCL |
| 1912-24-9 | Atrazine | 3 | 0.25 | Lifetime Health Adv. |
| | Barium **** | 1,000 | 500 | Primary D.W. Standard |
| 114-26-1 | Baygon (Propoxur) | 10 | 5-10 A | PQL / 3ug/L=Lifetime Health Advisory |
| 25057-89-0 | Bentazon | 20 | 5-10 A | Lifetime Health Adv. |
| 71-43-2 | Benzene **** | 1 | 1 | Primary D.W. Standard |
| | Benzenehexachloride (See Hexachloro-cyclohexane) | | | |
| 92-87-5 | Benzidine | 10 | 10 | PQL / 0.00015ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 56-55-3 | Benzo(a)anthracene | 10 | 10 | PQL |
| 205-99-2 | Benzo(b)fluoranthene | 10 | 10 | PQL |
| 207-08-9 | Benzo(k)fluoranthene | 10 | 10 | PQL |

*The concentrations in this table are only to be used as a screening guideline for ground water contamination. These concentrations are not standards and without further justification can not be used as standards.

mg/kg Soil

| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/ Comment |
|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 10 | 10 | PQL |
| 50-32-8 | Benzo(a)pyrene | 10 | 10 | PQL / 0.003ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 7440-41-7 | Beryllium | 5 | 5 | PQL / 0.004ug/L=$10^{-6}$ cancer risk (AWQCD) |
| | BHC (See Hexachloro-cyclohexane) | | | |
| 92-52-4 | Biphenyl | 10 | 5-10 A | PQL / 0.5ug/L = organoleptic (RPC) |
| | bis(2-eh)ph see di (...) | | | |
| 314-40-9 | Bromacil steve Dwinell highest soil right after application was 143 mg/kg | 90 | 10 | Lifetime Health Adv. |
| 75-27-4 | Bromodichloromethane (See Trihalomethane) | | | |
| 75-25-2 | Bromoform (See Trihalomethane) | | | |
| 74-83-9 | Bromomethane (Methyl bromide) | 20 | 10 | RPC |
| 101-55-3 | 4-Bromophenyl phenyl ether | 10 | 10 | PQL |
| 78-93-3 | 2-Butanone (See Methyl ethyl ketone) | | | |
| 123-86-4 | n-Butyl acetate | 43 | 5-10 X | Organoleptic (RPC) |
| 2008-41-5 | Butylate | 700 | 5-10 A | Lifetime Health Adv. |
| 85-68-7 | Butyl benzyl phthalate | 1,400 | 10 | IRIS |
| 85-70-1 | Butyl phthalyl butyl glycolate | 120,000 | 5-10 A | Water solubility limit (AWQCD ADI=350,000ug/L) |
| | Cadmium **** | 10 | 10 | Primary D.W. Standard |
| 63-25-2 | Carbaryl (Sevin) | 700 | 5 | Lifetime Health Adv. |
| 1563-66-2 | Carbofuran | 36 | 5 | Lifetime Health Adv. |
| 108-95-2 | Carbolic acid (See Phenol) | | | |
| 56-23-5 | Carbon tetrachloride **** (Tetrachloromethane) | 3 | 1 | Primary D.W. Standard |
| 5234-68-4 | Carboxin | 700 | 5-10 A | Lifetime Health Adv. |
| 133-90-4 | Chloramben | 100 | 5-10 A | Lifetime Health Adv. |
| 57-74-9 | Chlordane | 0.1 | 0.1 | PQL / 0.027 ug/L=$10^{-6}$ cancer risk (H.A.) |
| | Chloride **** | 250,000 | 1000 | Secondary D.W. Std. |
| 108-90-7 | Chlorobenzene | ~~10~~ 100 | 1 | Organoleptic (H.A.) 0.4 — 1.5 TARGET |
| 124-48-1 | Chlorodibromomethane (See Trihalomethane) | | | |

carbon disulfide child. 300 - adult 700

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 106-89-8 | 1-Chloro-2,3-epoxypropane (See Epichlorohydrin) | | | |
| 75-00-3 | Chloroethane (Ethyl chloride) | 6,300 | 2.5 | RPC |
| 111-91-1 | bis(2-Chloroethoxy) methane | 10 | 10 | PQL |
| 75-01-4 | Chloroethylene **** (Vinyl chloride) | 1 | 1 | Primary D.W. Standard |
| 111-44-4 | bis(2-Chloroethyl)ether (Dichloroethyl ether) | 10 | 10 | PQL / 0.031ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 110-75-8 | 2-Chloroethyl vinyl ether (Vinyl 2-chloroethyl ether) | 1 | 1 | PQL |
| 67-66-3 | Chloroform (See Trihalomethane) | | | |
| 108-60-1 | bis(2-Chloroisopropyl) ether | 10 | 10 | PQL / 7ug/L=EPA PPCL ADI |
| 74-87-3 | Chloromethane (Methyl chloride) | 3,800 | 1 | EPA PPCL (ADI) |
| 542-88-1 | bis(Chloromethyl) ether | 10 | 5-10 A | PQL / $3.8 \times 10^{-6}$ ug/L= $10^{-6}$ cancer risk (AWQCD) |
| 59-50-7 | 4-Chloro-3-methyl phenol (p-chloro-m-cresol) | 3,000 | 10 | Organoleptic (AWQCD) |
| 94-74-6 | 4-Chloro-2-methyl-phenoxy acetic acid (See MCPA) | | | |
| 91-58-7 | 2-Chloronaphthalene | 10 | 10 | PQL |
| 108-43-0 | 3-Chlorophenol | 10 | 10 | PQL / 0.1ug/L = organoleptic (AWQCD) |
| 106-48-9 | 4-Chlorophenol | 10 | 10 | PQL / 0.1ug/L = organoleptic (AWQCD) |
| 7005-72-3 | 4-Chlorophenyl phenyl ether | 10 | 10 | PQL |
| 76-06-2 | Chloropicrin | 7.3 | 5 | Organoleptic (RPC) |
| 1897-45-6 | Chlorothalonil (Bravo) | 2 | 1 | $10^{-6}$ cancer risk, Health Advisory |
| | Chromium **** | 50 | 50 | Primary D.W. Standard |
| 218-01-9 | Chrysene | 10 | 10 | PQL |
| | Color **** | 15 (color units) | | Secondary D.W. Std. |
| | Copper **** | 1000 | 100 | Secondary D.W. Std. |
| 21725-46-2 | Cyanazine | 30 | 30 | PQL / 10 ug/L= Lifetime Health Advisory |

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/ Comment |
|---|---|---|---|---|
| 57-12-5 | Cyanide | 154 | 40 | Lifetime Health Adv. |
| 94-75-7 | 2,4-D **** | 100 | 5 | Primary D.W. Standard |
| 1861-32-1 | Dacthal (DCPA) | 4,000 | 1 | Lifetime Health Adv. |
| 75-99-0 | Dalapon (2,2-Dichloro-propionic acid) | 200 | 5-10 A | Lifetime Health Adv. |
| 50-29-3 | DDT | 0.1 | 0.1 | PQL / 0.004 ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 2303-16-4 | Diallate | 10 | 10 | PQL / 0.045 ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 333-41-5 | Diazinon | 10 | 5-10 A | PQL / 0.6 ug/L= Lifetime Health Adv. |
| 53-70-3 | Dibenzo(a,h) anthracene | 10 | 10 | PQL |
| 124-48-1 | Dibromochloromethane (See Trihalomethane) | | | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | 0.025 | 0.025 | Lifetime Health Adv. |
| 106-93-4 | 1,2-Dibromoethane **** (Ethylene Dibromide, EDB) | 0.02 | 0.02 | Primary D.W. Standard |
| 84-74-2 | Di-n-butyl phthalate | 700 | 10 | IRIS |
| 1918-00-9 | Dicamba | 200 | 1 | Lifetime Health Adv. |
| 95-50-1 | o-Dichlorobenzene (1,2-Dichlorobenzene) | 10 | 2 | Organoleptic (H.A.) |
| 541-73-1 | m-Dichlorobenzene (1,3-Dichlorobenzene) | 10 | 2 | Organoleptic (H.A.) |
| 106-46-7 | p-Dichlorobenzene **** (1,4-Dichlorobenzene) | 75 | 2 | Primary D.W. Standard |
| 91-94-1 | 3,3-Dichlorobenzidine | 20 | 20 | PQL / 0.021ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 75-27-4 | Dichlorobromomethane (See Trihalomethane) | | | |
| 75-71-8 | Dichlorodifluoro-methane (Freon 12) | 1,400 | 5 | IRIS |
| 75-34-3 | 1,1-Dichloroethane | 2,400 | 1 | RPC |
| 107-06-2 | 1,2-Dichloroethane **** (Ethylene dichloride) | 3 | 1 | Primary D.W. Standard |
| 75-35-4 | 1,1-Dichloroethylene **** (Vinylidene chloride) | 7 | 1 | Primary D.W. Standard |
| 156-59-2 | cis-1,2-Dichloro-ethylene | ~~4.2~~ (70) | 1 | Organoleptic (RPC) & risk |
| 156-60-5 | trans-1,2-Dichloro-ethylene | ~~4.2~~ 100 | 1 | Organoleptic (RPC) & risk |

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/ Comment |
|---|---|---|---|---|
| 111-44-4 | Dichloroethyl ether (See bis(2-Chloro-ethyl) ether) | | | |
| 108-60-1 | Dichloroisopropyl ether (See bis (2-Chloroisopropyl) ether) | | | |
| 75-09-2 | Dichloromethane (See Methylene chloride) | | | |
| 542-88-1 | Dichloromethyl ether (See bis(Chloro-methyl ether) | | | |
| 576-24-9 | 2,3-Dichlorophenol | 10 | 10 | PQL / 0.04ug/L = organoleptic (AWQCD) |
| 120-83-2 | 2,4-Dichlorophenol | 10 | 10 | PQL / 0.3ug/L = organoleptic (AWQCD) |
| 583-78-8 | 2,5-Dichlorophenol | 10 | 10 | PQL / 0.5ug/L = organoleptic (AWQCD) |
| 87-65-0 | 2,6-Dichlorophenol | 10 | 10 | PQL / 0.2ug/L = organoleptic (AWQCD) |
| 95-77-2 | 3,4-Dichlorophenol | 10 | 10 | PQL / 0.3ug/L = organoleptic (AWQCD) |
| 78-87-5 | 1,2-Dichloropropane | 1 | 1 | PQL / 0.56 ug/L=$10^{-6}$ cancer risk (H.A.) |
| 542-75-6 | 1,3-Dichloropropene (DCP, Telone) | 1 | 1 | PQL / 0.2 ug/L=$10^{-6}$ cancer risk (H.A.) |
| 60-57-1 | Dieldrin | 0.05 | 0.05 | PQL / 0.002ug/L=$10^{-6}$ cancer risk (H.A.) |
| 117-81-7 | Di(2-ethylhexyl) phthalate | 14 | 10 | RPC |
| 84-66-2 | Diethyl phthalate | 5,600 | 10 | IRIS |
| 67239-16-1 | Dimethrin | 2,000 | 5-10 A | Lifetime Health Adv. |
| 105-67-9 | 2,4-Dimethyl phenol (2,4-Xylenol) | 400 | 10 | Organoleptic (AWQCD) |
| 131-11-3 | Dimethyl phthalate | 70,000 | 10 | EPA PPCL (ADI) |
| 534-52-1 | 4,6-Dinitro-o-cresol (2-Methyl-4,6-dinitrophenol) | 50 | 50 | PQL |
| 51-28-5 | 2,4-Dinitrophenol | 70 | 50 | EPA PPCL (ADI) |
| 121-14-2 | 2,4-Dinitrotoluene | ~~10~~ .2 | 10 | PQL / 0.11ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 608-20-2 | 2,6-Dinitrotoluene | ~~10~~ .1 | 10 | PQL |

*The concentrations in this table are only to be used as a screening guideline for ground water contamination. These concentrations are not standards and without further justification can not be used as standards.

| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 88-85-7 | Dinoseb | 7 | 0.5 | Lifetime Health Adv. |
| 117-84-0 | Di-n-octyl phthalate | 10 | 10 | PQL |
| 123-91-1 | p-Dioxane (1,4-Dioxane) | 10 | 5-10 A | PQL / 7ug/L= $10^{-6}$ cancer risk (CAG) |
| 1746-01-6 | Dioxin (See 2,3,7,8-Tetra chlorodibenzo-p-dioxin) | | | |
| 957-51-7 | Diphenamid | 200 | 5-10 A | Lifetime Health Adv. |
| 122-66-7 | 1,2-Diphenyl hydrazine | 10 | 10 | PQL / 0.045ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 298-04-4 | Disulfoton | 10 | 5-10 A | PQL / 0.3 ug/L= Lifetime Health Adv. |
| 330-54-1 | Diuron | 10 | 5-10 A | Lifetime Health Adv. |
| 15-29-7 | Endosulfan I + II both (alpha + beta) go to E. sulfate | 0.4 | 0.05 | IRIS |
| 1031-07-8 | Endosulfan sulfate | 0.3 | 0.3 | PQL |
| 145-73-3 | Endothall | 100 | 5-10 X | Lifetime Health Adv. |
| 72-20-8 | Endrin **** | 0.2 | 0.03 | Primary D.W. Standard |
| 7421-93-4 | Endrin aldehyde | 0.1 | 0.1 | PQL |
| 106-89-8 | Epichlorohydrin (unstable in $H_2O$) | 10 | 5-10 A | PQL / 3.5ug/L=$10^{-6}$ cancer risk (H.A.) |
| 75-21-8 | 1,2-Epoxyethane (See Ethylene oxide) | | | |
| 563-12-2 | Ethion | 14 | 0.5 | RPC |
| 141-78-6 | Ethyl acetate | 100 | 5-10 X | Organoleptic (RPC) |
| 100-41-4 | Ethylbenzene | 2 | 2 | PQL / 1.6 ug/L = organoleptic (RPC) |
| 75-00-3 | Ethylchloride (See Chloroethane) | | | |
| 166-93-4 | Ethylene dibromide **** (EDB, 1,2-Dibromo-ethane) | 0.02 | 0.02 | Primary D.W. Standard |
| 107-06-2 | Ethylene dichloride **** (1,2-Dichloroethane) | 3 | 1 | Primary D.W. Standard |
| 107-21-1 | Ethylene glycol | 7,000 | 5-10 X | Lifetime Health Adv. |
| 75-21-8 | Ethylene oxide (unstable in $H_2O$) | 10 | 5-10 A | PQL / 0.028ug/L=$10^{-6}$ cancer risk (EPA PPCL) |
| 96-45-7 | Ethylene thiourea (2-imidazoli-dinethione) | 0.5 | 0.5 X | PQL / 0.2 ug/L=$10^{-6}$ cancer risk (H.A.) |
| 84-72-0 | Ethyl phthalate ethyl glycolate | 17,500 | 5-10 A | EPA PPCL (ADI) |
| 22224-92-6 | Fenamiphos | 10 | 5-10 X | PQL / 2 ug/L= Lifetime Health Adv. |

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 2164-17-2 | Fluometuron | 90 | 50 | Lifetime Health Adv. |
| 206-44-0 | Fluoranthene (Idryl) | 42 | 10 | EPA PPCL (ADI) |
| 86-73-7 | Fluorene | 10 | 10 | PQL |
| | Fluoride **** | 4,000 | 10 | Primary D.W. Standard |
| | Fluoride **** | 2,000 | 10 | Secondary D.W. Std. |
| 75-69-4 | Fluorotrichloromethane (See Trichloromono fluoromethane) | | | |
| | Foaming agents **** | 500 | 100 | Secondary D.W. Std. |
| 944-22-9 | Fonofos | 10 | 5-10 A | Lifetime Health Adv. |
| 50-00-0 | Formaldehyde | 50 | 50 | PQL / 4.1 ug/L = RPC |
| 1071-83-6 | Glyphosate (Roundup) | 700 | 25 | Lifetime Health Adv. |
| 76-44-8 | Heptachlor | 0.076 | 0.05 | $10^{-6}$ cancer risk, H.A. |
| 1024-57-3 | Heptachlor epoxide | 0.1 | 0.1 | PQL / 0.038 ug/L=$10^{-6}$ cancer risk (H.A.) |
| 118-74-1 | Hexachlorobenzene (HCB) | 10 | 10 | PQL / 0.02ug/L=$10^{-6}$ cancer risk (CAG) |
| 87-68-3 | Hexachlorobutadiene | 10 | 10 | PQL / 0.45ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 319-84-6 | alpha-Hexachloro-cyclohexane (BHC) | 0.05 | 0.05 | PQL / 0.0035ug/L = $10^{-6}$ cancer risk (CAG) |
| 319-85-7 | beta-Hexachloro-cyclohexane (BHC) | 0.05 | 0.05 | PQL / 0.01ug/L = $10^{-6}$ cancer risk (CAG) |
| 58-89-9 | gamma-Hexachloro-cyclohexane **** (Lindane) | 4 | 0.05 | Primary D.W. Standard |
| 319-86-8 | delta-Hexachloro-cyclohexane (BHC) | 0.05 | 0.05 | PQL |
| 77-47-4 | Hexachlorocyclo-pentadiene | 10 | 10 | PQL / 1 ug/L= organoleptic (AWQCD) |
| 67-72-1 | Hexachloroethane | 10 | 10 | PQL / 3.4ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 110-54-3 | n-Hexane | 10 | 5-10 A | PQL / 6.4ug/L = organoleptic (RPC) |
| 51235-04-2 | Hexazinone (Velpar) | 200 | 5 | Lifetime Health Adv. |
| 206-44-0 | Idryl (See Fluoranthene) | | | |
| 96-45-7 | 2-Imidazoli-dinethione (See Ethylene thiourea) | | | |
| 193-39-5 | Indeno(1,2,3-cd) pyrene | 10 | 10 | PQL |
| | Iron **** | 300 | 150 | Secondary D.W. Std. |

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/ Comment |
|---|---|---|---|---|
| 78-59-1 | Isoacetophorone (See Isophorone) | | | |
| 78-59-1 | Isophorone | 1,050 # | 10 | AWQCD (ADI) |
| 98-82-8 | Isopropyl benzene (Cumene) | 10 | 5-10 A | PQL / 0.8ug/L = organoleptic (RPC) |
| | Lead **** | 50 | 50 | Primary D.W. Standard |
| 58-89-9 | Lindane **** | 4 | 0.05 | Primary D.W. Standard |
| 330-55-2 | Linuron | 22 | 0.05 | RPC |
| 123-33-1 | Maleic hydrazide | 4,000 | 5-10X | Lifetime Health Adv. |
| 12327-38-2 | Maneb | 75 | 75 | PQL / 14 ug/L = RPC |
| | Manganese **** | 50 | 25 | Secondary D.W. Std. |
| 94-74-6 | MCPA (4-Chloro-2-methylphenoxy acetic acid) | 1,000 | 1,000 A | PQL / 4 ug/L= Lifetime Health Adv. |
| | Mercury **** | 2 | 0.2 | Primary D.W. Standard |
| 10265-92-6 | Methamidophos | 18 | 5-10 X | RPC |
| 16752-77-5 | Methomyl | 200 | 50 | Lifetime Health Adv. |
| 72-43-5 | Methoxychlor **** | 100 | 0.5 | Primary D.W. Standard |
| 74-83-9 | Methyl bromide (See Bromomethane) | | | |
| 74-87-3 | Methyl chloride (See Chloromethane) | | | |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol (See 4,6-Dinitro-o-cresol) | | | |
| 75-09-2 | Methylene chloride (Dichloromethane) | 5 | 1 | $10^{-6}$ cancer risk (Health Advisory) |
| 78-93-3 | Methyl ethyl ketone (MEK, 2-Butanone) | 170 # | 10 | Lifetime Health Adv. |
| 60-34-4 | Methyl hydrazine | 10 | 5-10 A | PQL / 0.03ug/L=$10^{-6}$ cancer risk (EPA PPCL) |
| 108-10-1 | Methyl isobutyl ketone (4-Methyl-2-pentanone) | 350 # | 5 | IRIS |
| 298-00-0 | Methyl parathion | 10 | 5-10 A | PQL / 2ug/L= Lifetime Health Adv. |
| 51218-45-2 | Metolachlor | 100 | 5-10 A | Lifetime Health Adv. |
| 21087-64-9 | Metribuzin | 200 | 2 | Lifetime Health Adv. |
| 2385-85-5 | Mirex | 3.5 | 0.1 | RPC |
| 91-20-3 | Napthalene | 10 | 10 | PQL ' 6.8ug/L = organoleptic (RPC) |
| 7440-02-0 | Nickel | 150 | 50 | Lifetime Health Adv. |
| | Nitrate (as N) **** | 10,000 | 5 | Primary D.W. Standard |
| | Nitrite (as N) | 1,000 | 100 | Health Advisory |

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MTBE - 50 ug/l organoleptic
231 ug/l RPC (toxicity)

| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 98-95-3 | Nitrobenzene | 30 | 10 | Organoleptic (AWQCD) |
| 88-75-5 | 2-Nitrophenol (o-Nitrophenol) | 20 | 20 | PQL |
| 100-02-7 | 4-Nitrophenol (p-Nitrophenol) | 10 | 10 | PQL |
| 924-16-3 | N-Nitrosodi-n-butylamine | 10 | 5-10 A | PQL / 0.0064ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 55-18-5 | N-Nitrosodi-ethylamine | 10 | 5-10 A | PQL / 0.0008ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 62-75-9 | N-Nitrosodi-methylamine | 20 | 20 | PQL / 0.0014ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 86-30-6 | N-Nitrosodi-phenylamine | 10 | 10 | PQL / 0.0001ug/L=$10^{-6}$ cancer risk (EPA PPCL) |
| 759-73-9 | N-Nitroso-N-ethylurea | 10 | 5-10 X | PQL / 0.001ug/L=$10^{-6}$ cancer risk (EPA PPCL) |
| 684-93-5 | N-Nitroso-N-methylurea | 10 | 5-10 X | PQL / 0.0001ug/L=$10^{-6}$ cancer risk (EPA PPCL) |
| 621-64-7 | N-Nitrosodi-n-propylamine | 10 | 10 | PQL |
| 930-55-2 | Nitrosopyrrolidine | 10 | 10 | PQL / 0.016ug/L=$10^{-6}$ cancer risk (AWQCD) |
| | Odor **** | 3 T.O.N. | | Secondary D.W. Std. |
| 23135-22-0 | Oxamyl (Vydate) | 175 | 10 | Lifetime Health Adv. |
| 75-21-8 | Oxirane (See Ethylene oxide) | | | |
| 1910-42-5 | Paraquat | 30 | 5-10 X | Lifetime Health Adv. |
| 608-93-5 | Pentachlorobenzene | 120 | 10 | EPA PPCL (ADI) |
| 87-86-5 | Pentachlorophenol (PCP) | 30 | 10 | Organoleptic (RPC) |
| 127-18-4 | Perchloroethylene **** (Tetrachloro-ethylene | 3 | 1 | Primary D.W. Standard |
| | pH **** | 6.5-8.5 (standard units) | | Secondary D.W. Std. |
| 85-01-8 | Phenathrene | 10 | 10 | PQL |
| 108-95-2 | Phenol (Carbolic acid) | 20 | 10 | Organoleptic (RPC) |
| 103-85-8 | N-Phenylthiourea | 1,400 | 5-10 A | EPA PPCL (ADI) |
| 1918-02-1 | Picloram | 500 | 5-10 A | Lifetime Health Adv. |
| 1336-36-3 | Polychlorinated Biphenyls (PCBs) | 0.5 | 0.5 | PQL / 0.008 ug/L=$10^{-6}$ cancer risk (H.A.) |
| 1610-18-0 | Prometon | 100 | 5-10 A | Lifetime Health Adv. |
| 23950-58-5 | Pronamide | 50 | 5-10 A | Lifetime Health Adv. |
| 1918-16-7 | Propachlor | 90 | 5-10 A | Lifetime Health Adv. |
| 139-40-2 | Propazine | 10 | 5-10 A | Lifetime Health Adv. |

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 107-02-8 | Propenal (See Acrolein) | | | |
| 76-06-1 | 2-Propeneamide (see Acrylamide) | | | |
| 122-42-9 | Propham | 100 | 5-10 A | Lifetime Health Adv. |
| 129-00-0 | Pyrene | 10 | 10 | PQL |
| | Radium-226+228 **** | 5 pCi/L | | Primary D.W. Standard |
| | Selenium **** | 10 | 5 | Primary D.W. Standard |
| | Silver **** | 50 | 50 | Primary D.W. Standard |
| 93-72-1 | Silvex (2,4,5-TP) **** | 10 | 1 | Primary D.W. Standard |
| 122-34-9 | Simazine | 10 | 5-10 A | PQL / 4ug/L=Lifetime H.A. |
| | Sodium **** | 160,000 | 500 | Primary D.W. Standard |
| 100-42-5 | Styrene (Vinyl benzene) | 1 | 1 | PQL / 0.01 ug/L=$10^{-6}$ cancer risk (H.A.) |
| | Sulfate **** | 250,000 | 500 | Secondary D.W. Std. |
| 93-76-5 | 2,4,5-T (See 2,4,5-Trichlorophenoxy-acetic acid) | | | |
| | TDS (Total Dissolved Solids) **** | 500,000 | | Secondary D.W. Std. |
| 34014-18-1 | Tebuthiuron | 500 | 5-10 A | Lifetime Health Adv. |
| 116-06-3 | Temik (See Aldicarb) | | | |
| 5902-51-2 | Terbacil | 90 | 5-10 A | Lifetime Health Adv. |
| 13071-79-9 | Terbufos | 10 | 5-10 A | PQL / 0.9 ug/L= Lifetime Health Adv. |
| 95-94-3 | 1,2,4,5-Tetrachloro-benzene | 35 | 10 | EPA PPCL (ADI) |
| 1746-01-6 | 2,3,7,8-Tetrachloro-dibenzo-p-dioxin (TCDD, Dioxin) | 0.01 | 0.01 | PQL / $2.2 \times 10^{-7}$ ug/L= $10^{-6}$ cancer risk (Health Advisory) |
| 79-34-5 | 1,1,2,2-Tetra-chloroethane | 1 | 1 | PQL / 0.8 ug/L = RPC |
| 127-18-4 | Tetrachloroethylene **** (Perchloroethylene) | 3 | 1 | Primary D.W. Standard |
| 56-23-5 | Tetrachloromethane **** (Carbon-tetrachloride) | 3 | 1 | Primary D.W. Standard |
| 7440-28-0 | Thallium | 10 | 10 | PQL / 3.7ug/L=EPA PPCL |
| 108-88-3 | Toluene | 24 | 1 | Organoleptic (RPC) |
| 636-21-5 | o-Toluidine hydrochloride | 10 | 5-10 X | PQL / 0.146ug/L=$10^{-6}$ cancer risk (EPA PPCL) |
| | Total Dissolved Solids (TDS) **** | 500,000 | | Secondary D.W. Std. |
| 8001-35-2 | Toxaphene **** | 5 | 1 | Primary D.W. Standard |

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| CAS # | Parameter | Guidance* Concentration (ug/L) | Practical Quantitation Level (ug/L) | Basis/Comment |
|---|---|---|---|---|
| 73-72-1 | 2,4,5-TP (Silvex) **** | 10 | 1 | Primary D.W. Standard |
| 75-25-2 | Tribromomethane (see Bromoform) | | | |
| 120-82-1 | 1,2,4-Trichloro-benzene | 140 | 10 | IRIS |
| 71-55-6 | 1,1,1-Trichloro-ethane **** | 200 | 20 | Primary D.W. Standard |
| 79-00-5 | 1,1,2-Trichloro-ethane | 1 | 1 | PQL / 0.61ug/L=$10^{-6}$ cancer risk (AWQCD) |
| 79-01-6 | Trichloroethene **** (Trichloro-ethylene, TCE) | 3 | 1 | Primary D.W. Standard |
| 67-66-3 | Trichloromethane (See Chloroform) | | | |
| 75-69-4 | Trichloromono-fluromethane trichlorotrifluoroethane | 2,400 210,000 | 1 | EPA PPCL (ADI) IRIS - by Teaf. |
| 95-95-4 | 2,4,5-Trichloro-phenol | 10 | 10 | PQL / 1ug/L = organoleptic (AWQCD) |
| 88-06-2 | 2,4,6-Trichloro-phenol | 10 | 10 | PQL / 1.2ug/L = $10^{-6}$ cancer risk (AWQCD) |
| 93-76-5 | 2,4,5-Trichloro-phenoxyacetic acid (2,4,5-T) | 70 | 1 | Lifetime Health Adv. |
| 1582-09-8 | Trifluralin | 10 | 5-10 A | PQL / 2ug/L= Lifetime Health Adv. |
| | Trihalomethanes **** (total) | 100 | | Primary D.W. Standard |
| | Trimethyl benzenes (total) | 10 | 5-10 A | PQL / 0.24ug/L = organoleptic (RPC) |
| 786-19-6 | Trithion | 12 | 5-10 X | RPC |
| 100-42-5 | Vinyl benzene (See Styrene) | | | |
| 75-01-4 | Vinyl chloride **** (Chloroethylene) | 1 | 1 | Primary D.W. Standard |
| 110-75-8 | Vinyl 2-chloroethyl ether (See 2-Chloro-ethyl vinyl ether) | | | |
| 107-13-1 | Vinyl cyanide (See Acrylonitrile) | | | |
| 75-35-4 | Vinylidene chloride **** (1,1-Dichloro-ethylene) | 7 | 1 | Primary D.W. Standard |
| 1330-20-7 | Xylenes (total) | 50 | 5 | Organoleptic (RPC) |
| 105-67-9 | 2,4-Xylenol (See 2,4-Dimethyl phenol) | | | |
| | Zinc **** | 5,000 | 25 | Secondary D.W. Std. |
| 12122-67-7 | Zineb | 14 | 5-10 X | RPC |

## SYMBOLS AND ABBREVIATIONS

| | |
|---|---|
| * | - The concentrations in this table are only to be used as a screening guideline for ground water contamination. These concentrations are not standards and without further justification can not be used as standards. |
| ** | - Guidance Concentration for Aldicarb Sulfone in the presence of Aldicarb or Aldicarb Sulfoxide is 10 ug/L. |
| *** | - Guidance Concentration applies to asbestos fibers exceeding 10 um in length. |
| **** | - Florida Primary or Secondary Drinking Water Standard: Chapter 17-550.310-320, F.A.C. |
| # | - Organoleptic threshold data may necessitate a lower Guidance Concentration |
| A | - Practical Quantitation Level of 5-10 ug/L based on gas chromotograph detection with mass spectrometer confirmation. Estimated by Tom Presely, Methodology Department, EPA Laboratory, Cincinnati, and Geoffrey Watts, Bureau of Waste Cleanup DER, Tallahassee. |
| ADI | - Acceptable Daily Intake |
| AWQCD | - Ambient Water Quality Criteria Documents, EPA 1980. |
| CAG | - Carcinogen Assessment Group, EPA 1980. |
| CAS # | - American Chemical Society's Chemical Abstract Service, 8th Collective Index |
| EPA | - Environmental Protection Agency. |
| H.A. | - Health Advisory, EPA Office of Drinking Water. |
| IRIS | - Intergrated Risk Information System, EPA January 1989 |
| MCL | - Maximum Contaminant Level, EPA. |
| OPP | - Office of Pesticide Programs, EPA, 1984. |
| Organoleptic | - taste and odor. |
| PPCL | - Preliminary Protective Concentration Limits, EPA Draft, 1984. |
| PQL | - Practical Quantitation Level; the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The Practical Quantitation Level can be estimated to be five (5) times the method detection limit. Federal Register: Vol.52, No.131, Thursday, July 9, 1987, pgs. 25947-25953. |
| RPC | - Recommended Protective Concentration: Toxicant Profiles, Center for Biomedical and Toxicological Research, Florida State University, 1985-1988. |
| T.O.N. | - Threshold Odor Number |
| X | - An EPA approved method for the analysis of this chemical in water has not been established at this time. Routine analyses for this chemical is not recommended unless its presence is suspected. |

# APPENDIX

The Guidance Concentrations in this booklet were derived from published health based information using the following priorities. First, Health Advisories issued by the EPA Office of Drinking Water were used. Second, Recommended Protective Concentrations (RPCs) for the protection of human health identified in the Toxicant Profile series were added. Third, new Maximum Contaminant Levels (MCLs) proposed by EPA as Primary Drinking Water Standards were used. Fourth, concentrations from the EPA Ambient Water Quality Criteria Documents (AWQCD), and table 1 of the EPA Draft Preliminary Protective Concentration Limits (PPCLs) for ground water were compiled. Where the concentrations from these last two sources were significantly different, the data were reviewed and a judgement made on their reliability, taking into account the dates of the studies. Fifth, in cases where the organoleptic (taste and odor) threshold concentration was less than the above health based concentrations, the organoleptic threshold concentration was used as the Guidance Concentration. Last, the 129 EPA Priority Pollutants and the Florida Primary and Secondary Drinking Water Standards were added to the list.

In September 1985, EPA's Office of Drinking Water issued 52 draft Health Advisories, finalizing 48 of these Health Advisories in March 1987. An additional 50 draft Health Adviories addressing pesticides were issued in August 1987 and finalized August 1988. Health Advisories describe nonregulatory concentrations of drinking water contaminants at which adverse health effects would not be anticipated to occur over specific exposure durations. The most conservative exposure duration, the lifetime health advisory, was selected for inclusion in this booklet. In those cases where a lifetime Health Advisory was not recommended due to evidence of carcinogenicity, the concentration representing the $10^{-6}$ additional lifetime cancer risk was used.

Toxicant Profiles for approximately 45 chemicals or chemical classes were developed by the Center for Biomedical and Toxicological Research (CBTR) at the Florida State University from 1985 to 1988 for both the Department of Environmental Regulation and the Department of Health and Rehabilitative Services. These profiles detailed physical and chemical properties and reviewed the available animal toxicity and occupational exposure data for specific contaminants. Where adequate data existed, these profiles proposed a Recommended Protective Concentration (RPC) calculated to protect human health, assuming a water intake of 2 L/ day and a maximum 20% contribution to the Acceptable Daily Intake (ADI) by drinking water.

1986 amendments to the Safe Drinking Water Act required EPA to issue Maximum Contaminant Levels (MCLs) for 40 drinking water contaminants by June 1988 and another 32 MCLs by June 1989. Of the 40 1988 MCLs, 14 address existing Florida drinking water standards, while the remaining 26 currently have no Florida drinking water standard. The proposed MCLs for these 26 contaminants were used in this booklet.

EPA's Intergrated Risk Information System (IRIS) was searched January 15, 1989 for a limited number of chemicals not updated by the above health based data sources. Guidance Concentrations based upon IRIS are identified in the "Basis/ Comment" column.

The 1980 EPA Ambient Water Quality Criteria Document (AWQCD) concentrations were based upon carcinogenic, toxic, and organoleptic (taste and odor) endpoints. A modification of these concentrations was necessary since they assume exposure from consumption of aquatic organisms, as well as from drinking the affected water directly. For a ground water quideline, exposure was assumed to be from drinking only, since edible aquatic organisms are not usually found in groundwater. This correction was accomplished by adding the percentage of the exposure due to the consumption of aquatic organisms to the derived concentration. Where this percentage was not given, the Guidance Concentration was derived by dividing the Acceptable Daily Intake (ADI) by the average adult daily consumption of water (2L). The $10^{-6}$ additional lifetime cancer risk was cited for potential carcinogens. For noncarcinogens, the criterion was based upon extrapolation from animal experimentation or human data.

Draft EPA Preliminary Protective Concentration Limits (PPCLs) were developed in October, 1984 by the EPA Environmental Criteria and Standards Office, Cincinnati and the EPA Carcinogen Assesment Group, Washington, DC to give guidance to permit writers in cases of ground water contamination. The PPCLs are based upon the Acceptable Daily Intakes (ADIs) and the incremental cancer risk of $10^{-6}$, but are not standards.

In cases where the organoleptic (taste and odor) threshold concentration was less than the health based concentrations, the organoleptic threshold concentration was used as the Guidance Concentration. Chemicals that cause an objectionable taste or odor in ground water may constitute a nuisance in violation of Minimum Criteria for ground water (Rule 17-3.402(1)(e), F.A.C.).

The Florida Primary and Secondary Drinking Water Standards were included in this booklet as a convience for its users. These drinking water standards (denoted by: ****) are legally enforceable standards in ground water (Rule 17-3.404, F.A.C.).

Practical Quantitation Levels (PQLs) were compiled from the EPA 600 Series Approved Methodologies and those used by the DER SPAN Laboratory, Tallahassee. PQLs are defined as the lowest level that can be reliably achieved within specified limits of precision and accuracy under routine laboratory operating conditions. These levels are an estimate of the concentrations routinely quantifiable by most analytical laboratories. These levels may, however, vary between laboratories and with time within a laboratory due to differences in equipment, equipment operating conditions, sample interferences, and other reasons. In general, PQLs can be estimated to be five (5) times the method detection limit (Federal Register Vol. 52, No. 131, Thursday, July 9, 1987, pgs. 25947-25953).

For those chemicals with no identifiable PQL, a PQL of 5-10 ug/L was estimated by Tom Presely, Methodology Department, EPA Laboratory, Cincinnati, and Geoffrey Watts, Bureau of Waste Cleanup, DER Tallahassee based upon gas chromatograph detection with mass spectrometer confirmation. When the health based or organoleptic threshold concentration was less than the PQL, the PQL was selected as the Guidance Concentration and the health based or organoleptic threshold concentration noted. For those cases where there was no health based or organoleptic threshold information available from the above sources, the PQL was selected as the Guidance Concentration.