

The Vermont Department of Health (Health Department) Drinking Water Guidance document (Guidance) contains three types of values that may be used in the evaluation of drinking water supplies:

- Primary Maximum Contaminant Levels (**MCLs**) are legally enforceable standards promulgated by the United States Environmental Protection Agency (U.S. EPA) for use in the regulation of public water systems. Each value represents the highest level of a chemical that is allowed in a public drinking water supply. An MCL reflects consideration of public health concerns due to exposure via ingestion as drinking water and potentially other factors such as cost-benefit analysis, detection limit and best available treatment technology. MCLs are derived for chemicals with carcinogenic and adverse non-carcinogenic health endpoints.
- Vermont Health Advisories (**VHAs**) are numeric guidelines researched and derived by the Health Department for chemicals that do not have a federal MCL. A VHA reflects consideration of public health concerns and analytical laboratory reporting limits. VHAs consider ingestion exposure for all chemicals as well as potential exposure via inhalation of vapors due to household water use for those chemicals that easily volatilize. VHAs are derived for chemicals with carcinogenic and adverse non-carcinogenic health endpoints. If a VHA is exceeded, it does not necessarily follow that that adverse health effects may occur, but that exposure should be minimized while further evaluation of the water supply is conducted.
- Vermont Action Levels (**VALs**) are numeric guidelines researched and derived by the Health Department for a small number of chemicals that have MCLs but are of specific public health interest for Vermont Public Water Systems. Thus, these few chemicals have both a federal MCL and a Health Department derived value. VALs are concentrations at or above which a specific (priority) procedure will be followed in order to provide adequate protection of public health. The process employed to derive VALs is the same as for VHAs.

Collectively, these values provide critical information for use in the evaluation of potential health implications that may be associated with exposure to chemicals of concern in tap water.

Most existing Health Department derived values were developed in 2002. Since that time:

- Updated toxicity information has become available for several chemicals in the document.
- Guidance values have been requested to be developed for additional chemicals.
- There has been increased consideration of potentially sensitive subpopulations and/or life-stages.
- There has been increased consideration of potential exposure via inhalation of vapors due to routine household water use.
- Updated information has become available regarding age-specific water ingestion rates.
- Quantitative human health risk assessment methodology has continued to evolve.

The current Health Department derivation process takes these factors, as well as others, into consideration. Health Department derived values are based on an incremental lifetime carcinogenic risk of one in million for carcinogenic effects and a hazard index of one for systemic, non-carcinogenic effects. In those instances where a derived value is less than a reasonable analytical laboratory reporting limit, the reporting limit is used.

All Health Department guidance values available to date, both federal MCLs and Department derived values, are presented in the table which follows. Chemicals with any changes since the 2002 Guidance are noted in **bold**.

DRINKING WATER GUIDANCE

| Chemical Name | CAS No. | VHA (µg/L) ^(a) | VAL (µg/L) ^(a) | MCL (µg/L) ^(a) |
|---|--------------------|---------------------------|---------------------------|----------------------------------|
| Acetone | 67-64-1 | 649.8 | | |
| Acifluorfen, sodium | 62476-59-9 | 9.9 | | |
| Alachlor | 15972-60-8 | | | 2 |
| Aldicarb | 116-06-3 | | | 3^(b) |
| Aldicarb sulfone | 1646-88-4 | | | 2^(b) |
| Aldicarb sulfoxide | 1646-87-3 | | | 4^(b) |
| Aldrin | 309-00-2 | 0.1 | | |
| Ametryn | 834-12-8 | 246.8 | | |
| Aminoethyl ethanolamine (AEEA) | 111-41-1 | 20 | | |
| Ammonium sulfamate | 7773-06-0 | 914.3 | | |
| Anthracene | 120-12-7 | 342.9 | | |
| Antimony | 7740-36-0 | | | 6 |
| Arsenic | 7440-38-2 | | | 10 |
| Asbestos | 1332-21-4 | | | 7E+6 fibers/L (longer than 10µm) |
| Atrazine | 1912-24-9 | | | 3 |
| Azoxystrobin | 131860-33-8 | 558.3 | | |
| Barium | 7440-39-3 | | | 2000 |
| Bendiocarb | 22781-23-3 | 1.7 | | |
| Benefin (Benfluralin) | 1861-40-1 | 5.5 | | |
| Benomyl | 17804-35-2 | 1 | | |
| Bensulide | 741-58-2 | 15.6 | | |
| Bentazon | 25057-89-0 | 453.1 | | |
| Benzene | 71-43-2 | | 0.5 | 5 |
| Benzo(a)pyrene | 50-32-8 | | | 0.2 |
| Beryllium | 7440-41-7 | | | 4 |
| Bis(2-chloro-1-methyl ethyl) ether | 108-60-1 | 45.7 | | |
| Bispyribac sodium | 125401-92-5 | 300.2 | | |
| Boron | 7440-42-8 | 869.6 | | |
| Boscalid | 188425-85-6 | 145.1 | | |
| Bromacil | 314-40-9 | 110.9 | | |
| Bromate | 15541-45-4 | | | 10 |
| Bromochloromethane | 74-97-5 | 7.7 | | |
| Bromomethane (Methyl bromide) | 74-83-9 | 5.4 | | |
| Bromoxynil | 1689-84-5 | 1 | | |
| Butylate | 2008-41-5 | 170.4 | | |
| Cadmium | 7440-43-9 | | | 5 |

DRINKING WATER GUIDANCE

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|-----------------------------|--------------------|---------------------------|---------------------------|---------------------------|
| Carbaryl | 63-25-2 | 26 | | |
| Carbofuran | 1563-66-2 | | | 40 |
| Carbon tetrachloride | 56-23-5 | | 0.5 | 5 |
| Carboxin | 5234-68-4 | 22.3 | | |
| Carfentrazone ethyl | 128639-02-1 | 47.9 | | |
| Chloramben | 133-90-4 | 68.6 | | |
| Chlorantraniliprole | 500008-45-7 | 5208.6 | | |
| Chlordane | 12789-03-6 | | | 2 |
| Chlorflurenol | 2536-31-4 | 457.1 | | |
| Chlorine | 7782-50-5 | | | 4000^(c) |
| Chlorite | 7758-19-2 | | | 1000 |
| Chlorobenzene | 108-90-7 | | | 100 |
| Chlorothalonil | 1897-45-6 | 1.5 | | |
| Chlorotoluene (ortho) | 95-49-8 | 100 | | |
| Chlorotoluene (para) | 106-43-4 | 100 | | |
| Chlorpyrifos | 2921-88-2 | 20 | | |
| Chromium (total) | 7440-47-3 | | | 100 |
| Cimectacarb | 95266-40-3 | 1050 | | |
| Clopyralid | 1702-17-6 | 330 | | |
| Copper (at tap) | 7440-50-8 | 1300 ^(d) | | |
| Cyanazine | 21725-46-2 | 1 | | |
| Cyanide | 143-33-9 | | | 200 |
| Dacthal | 1861-32-1 | 7 | | |
| Dalapon | 75-99-0 | | | 200 |
| Dazomet | 533-74-4 | 88 | | |
| Di(2-ethylhexyl)adipate | 103-23-1 | | | 400 |
| Di(2-ethylhexyl)phthalate | 117-81-7 | | | 6 |
| Diazinon | 333-41-5 | 0.6 | | |
| Dibromochloropropane | 96-12-8 | | 0.02 | 0.2 |
| Dicamba | 1918-00-9 | 189 | | |
| Dichlorobenzene (meta) | 541-73-1 | 600 ^(e) | | |
| Dichlorobenzene (ortho) | 95-50-1 | | | 600 |
| Dichlorobenzene (para) | 106-46-7 | | | 75 |
| Dichlorodifluoromethane | 75-71-8 | 1000 | | |
| Dichloroethane (1,1) | 75-34-3 | 70 | | |
| Dichloroethane (1,2) | 107-06-2 | | 0.5 | 5 |
| Dichloroethene (1,1) | 75-35-4 | | | 7 |
| Dichloroethene (cis-1,2) | 156-59-2 | | | 70 |

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|----------------------------------|------------------|---------------------------------|---------------------------------|---------------------------------|
| Dichloroethene (trans-1,2) | 156-60-5 | | | 100 |
| Dichlorophenoxyacetic acid (2,4) | 94-75-7 | | | 70 |
| Dichloroprop | 120-36-5 | 140 | | |
| Dichloropropane (1,2) | 78-87-5 | | 0.5 | 5 |
| Dichloropropene (1,3) | 542-75-6 | 0.5 | | |
| Dieldrin | 60-57-1 | 0.02 | | |
| Diethylenetriamine (DETA) | 111-40-0 | 5154 | | |
| Dimethrin | 70-38-2 | 2000 | | |
| Dinoseb | 88-85-7 | | | 7 |
| Dioxane (1,4) | 123-91-1 | 0.3 | | |
| Diphenamid | 957-51-7 | 200 | | |
| Diquat | 85-00-7 | | | 20 |
| Disulfoton | 298-04-4 | 0.3 | | |
| Diuron | 330-54-1 | 10 | | |
| Endothall | 145-73-3 | | | 100 |
| Endrin | 72-20-8 | | | 2 |
| Erioglaucine | 2650-18-2 | 7211.4 | | |
| Ethofumesate | 26225-79-6 | 280 | | |
| Ethoprop | 13194-48-4 | 1 | | |
| Ethylbenzene | 100-41-4 | | | 700 |
| Ethylene dibromide | 106-93-4 | | | 0.05 |
| Ethylene glycol | 107-21-1 | 7000 | | |
| Ethylene thiourea | 96-45-7 | 5 | | |
| Etridiazole | 2593-15-9 | 1 | | |
| Fenamiphos | 22224-92-6 | 2 | | |
| Fenarimol | 60168-88-9 | 630.5 | | |
| Fluometuron | 2164-17-2 | 90 | | |
| Fluoranthene | 206-44-0 | 280 | | |
| Fluorene | 86-73-7 | 280 | | |
| Fluoride | 7681-49-4 | | | 4000 |
| Flurprimidol | 56425-91-3 | 700 | | |
| Flutolanil | 66332-96-5 | 1400 | | |
| Fluvalinate | 69409-94-5 | 70 | | |
| Fonofos | 944-22-9 | 10 | | |
| Formaldehyde | 50-00-0 | 1000 | | |
| Fosetyl-al | 39148-24-8 | 2343 | | |
| Glufosinate-ammonium | 77182-82-2 | 20 | | |

DRINKING WATER GUIDANCE

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|--|-------------------|---------------------------------|---------------------------------|---------------------------------|
| Glyphosate | 1071-83-6 | | | 700 |
| Gross Alpha (adjusted) | NA | | | 15 pCi/L ^(f) |
| Haloacetic acids (total) | NA | | | 60 |
| Halofenozide | 112226-61-6 | 46 | | |
| Halosulfuron-methyl | 100784-20-1 | 990 | | |
| Heptachlor | 76-44-8 | | | 0.4 |
| Heptachlor epoxide | 1024-57-3 | | | 0.2 |
| Hexachlorobenzene | 118-74-1 | | 0.1 | 1 |
| Hexachlorobutadiene | 87-68-3 | 1 | | |
| Hexachlorocyclopentadiene | 77-47-4 | | | 50 |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | 121-82-4 | 0.3 | | |
| Hexane (n) | 110-54-3 | 420 | | |
| Hexazinone | 51235-04-2 | 200 | | |
| Imidacloprid | 138261-41-3 | 93 | | |
| Iprodione | 36734-19-7 | 280 | | |
| Isophorone | 78-59-1 | 100 | | |
| Isoxaben | 82558-50-7 | 175 | | |
| Lead (at tap) | 7439-92-1 | 15 ^(d) | | |
| Lindane | 58-89-9 | | | 0.2 |
| Maleic hydrazide | 123-33-1 | 4000 | | |
| Maneb | 12427-38-2 | 35 | | |
| Manganese | 7439-96-5 | 300 | | |
| MCPA [4(chloro-2-methoxyphenoxy) acetic acid] | 94-74-6 | 10 | | |
| Mecoprop | 93-65-2 | 35 | | |
| Mercury (inorganic) | 7487-94-7 | | | 2 |
| Metalaxyl | 57837-19-1 | 350 | | |
| Methomyl | 16752-77-5 | 200 | | |
| Methoxychlor | 72-43-5 | | | 40 |
| Methyl ethyl ketone | 78-93-3 | 4200 | | |
| Methyl isobutyl ketone | 108-10-1 | 560 | | |
| Methyl parathion | 298-00-0 | 2 | | |
| Methyl tert butyl ether (MTBE) | 1634-04-4 | 11.3 | | |
| Methylene chloride | 75-09-2 | | | 5 |
| Metolachlor | 51218-45-2 | 70 | | |
| Metribuzin | 21087-64-9 | 32.5 | | |
| Molybdenum | 7439-98-7 | 40 | | |
| Monochloramine | 10599-90-3 | | | 4000^(c) |
| Myclobutanil | 88671-89-0 | 120 | | |

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|---|--------------------|---------------------------------|---------------------------------|---------------------------------|
| Naphthalene | 91-20-3 | 20 | | |
| Napropamide | 15299-99-7 | 70 | | |
| Nickel | 7440-02-0 | 100 | | |
| Nitrate (as N) | 14797-55-8 | | | 10000 |
| Nitrates/Nitrites (total) | NA | | | 10000 |
| Nitrite (as N) | 14797-65-0 | | | 1000 |
| O-Phenylphenol (OPP) | 90-43-7 | 697.8 | | |
| Octahydro-1,3,5,7-tetranitro-1,2,3,5,7-tetrazocine (HMX) | 2691-41-0 | 57.1 | | |
| Oxamyl | 23135-22-0 | | | 200 |
| Paclobutrazol | 76738-62-0 | 455 | | |
| Paraquat | 1910-42-5 | 30 | | |
| Pendimethalin | 40487-42-1 | 280 | | |
| Pentachloronitrobenzene | 82-68-8 | 6 | | |
| Pentachlorophenol | 87-86-5 | | 0.1 | 1 |
| Pentaerythriol tetranitrate (PETN) | 78-11-5 | 2.3 | | |
| Perchlorate | 1479-73-0 | 2.2 | | |
| Phenol | 108-95-2 | 2100 | | |
| Picloram | 1918-02-1 | | | 500 |
| Polychlorinated Biphenyls | 1336-36-3 | | | 0.5 |
| Prometon | 1610-18-0 | 100 | | |
| Pronamide | 23950-58-5 | 50 | | |
| Propachlor | 1918-16-7 | 90 | | |
| Propamocarb hydrochloride | 25606-41-1 | 924 | | |
| Propazine | 139-40-2 | 10 | | |
| Propham | 122-42-9 | 100 | | |
| Propiconazole | 60207-90-1 | 104 | | |
| Propoxur (Baygon) | 114-26-1 | 6.2 | | |
| Quinclorac | 84087-01-4 | 369 | | |
| Radium ^{226 & 228} | 7440-14-4 | | | 5 pCi/L |
| Radon | 010043-92-2 | 4000 pCi/L^(g) | | |
| Selenium | 7782-49-2 | | | 50 |
| Simazine | 122-34-9 | | | 4 |
| Styrene | 100-42-5 | | | 100 |
| Tall oil hydroxyethyl imidazoline | 61791-39-7 | 118 | | |
| Tartrazine | 1934-21-0 | 3809.5 | | |
| Tebuthiuron | 34014-18-1 | 500 | | |
| Terbacil | 5902-51-2 | 90 | | |
| Terbufos | 13071-79-9 | 0.9 | | |
| Tetrachlorodibenzo-p-dioxin (2,3,7,8) | 1746-01-6 | | | 3.00E-05 |

DRINKING WATER GUIDANCE

| Chemical Name | CAS No. | VHA (µg/L) ^(a) | VAL (µg/L) ^(a) | MCL (µg/L) ^(a) |
|--|-----------------|---------------------------|---------------------------|---------------------------|
| Tetrachloroethane (1,1,1,2) | 630-20-6 | 70 | | |
| Tetrachloroethylene | 127-18-4 | | 1 | 5 |
| Thallium | 7440-28-0 | | | 2 |
| Thiophanate methyl | 23564-05-8 | 560 | | |
| Thiram | 137-26-8 | 35 | | |
| Toluene | 108-88-3 | | | 1000 |
| Toxaphene | 8001-35-2 | | | 3 |
| Triadimefon | 43121-43-3 | 10 | | |
| Trichlorfon | 52-68-6 | 1.5 | | |
| Trichlorobenzene (1,2,4) | 120-82-1 | | | 70 |
| Trichlorobenzene (1,3, 5) | 108-70-3 | 40 | | |
| Trichloroethane (1,1,1) | 71-55-6 | | | 200 |
| Trichloroethane (1,1,2) | 79-00-5 | | | 5 |
| Trichloroethylene | 79-01-6 | | 0.5 | 5 |
| Trichlorofluoromethane | 75-69-4 | 2100 | | |
| Trichlorophenoxyacetic acid (2,4,5) | 93-76-5 | 70 | | |
| Trichlorophenoxypropionic acid (2,4,5) | 93-72-1 | | | 50 |
| Trichloropropane (1,2,3) | 96-18-4 | 0.02 | | |
| Triclopyr | 55335-06-3 | 487 | | |
| Trifloxystrobin | 141517-21-7 | 410 | | |
| Trifluralin | 1582-09-8 | 5 | | |
| Trihalomethanes (total) | NA | | | 80 |
| Trimethyl benzene (1,2,3) | 526-73-8 | 5.1^(h) | | |
| Trimethyl benzene (1,2,4) | 95-63-6 | 5.1^(h) | | |
| Trimethyl benzene (1,3,5) | 108-67-8 | 5.1^(h) | | |
| Trinitrotoluene (2,4,6) (TNT) | 118-96-7 | 0.8 | | |
| Uranium | 7440-61-1 | | | 20 ⁽ⁱ⁾ |
| Vinyl chloride | 75-01-4 | | 0.5 | 2 |
| Xylenes | 1330-20-7 | | | 10000 |
| Zineb | 142-14-3 | 350 | | |

Notes:**BOLD** - new value for 2015

NA - Not Applicable

(a) - All units are micrograms per Liter (µg/L) [parts per billion (ppb)] unless otherwise noted

(b) - MCL of 7 µg/L for any combination of Aldicarb, Aldicarb sulfone and Aldicarb sulfoxide

(c) - EPA 1998 Final Rule for Disinfectants and Disinfection By-products Maximum Residual Disinfection (MRDL)

(d) - Copper and Lead are regulated using "Action Levels" (40CFR141.8)

(e) - Value for meta based on data for ortho dichlorobenzene

(f) - Adjusted includes Ra²²⁶; excludes Uranium and Radon

(g) - water results should be interpreted after air results are obtained

(h) - Sum of 1,2,3-TMB, 1,2,4-TMB and 1,3,5-TMB isomers not to equal or exceed 5.1 µg/L

(i) - Uranium MCL is the Vermont MCL. Federal MCL is 30 µg/L.

U.S. EPA Secondary Maximum Contaminant Levels^(a)

| Chemical Name | CAS No. | SMCL (µg/L) ^(b) |
|------------------------|-----------|----------------------------|
| Aluminum | 7429-90-5 | 50-200 |
| Chloride | 7647-14-5 | 250000 |
| Color | NA | 15 Color Units |
| Copper | 7440-50-8 | 1000 |
| Corrosivity | NA | non-corrosive |
| Fluoride | 7681-49-4 | 2000 |
| Foaming Agents | NA | 500 |
| Iron | 7430-89-6 | 300 |
| Manganese | 7439-96-5 | 50 |
| Odor | NA | 3 threshold odor number |
| pH | NA | 6.5-8.5 ^(c) |
| Silver | 7440-22-4 | 100 |
| Sodium | 7440-23-5 | 250000 ^(d) |
| Sulfate | 7757-82-6 | 250000 |
| Total Dissolved Solids | NA | 500000 |
| Zinc | 7440-66-6 | 5000 |

Notes:

NA - Not Applicable

SMCL - U.S. EPA Secondary Maximum Contaminant Level

(a) - The U.S. EPA MCLs presented in the main table are Primary Maximum Contaminant Levels. For reference purposes, the U.S. EPA Secondary MCLs above are used in regulation of contaminants in drinking water that primarily affect the aesthetic qualities relating to the public acceptance of drinking water (40CFR§143.3). Refer to Chapter 21, the Water Supply Rule, Subchapter 6.13.

(b) - All units are micrograms per Liter (µg/L) [parts per billion (ppb)] unless otherwise noted

(c) - pH standard units

(d) - Vermont Secondary Maximum Contaminant Level; Vermont Water Supply Rule 2010, Table 6-2.