

**PROPOSED PERMANENT REGULATION OF THE  
NEVADA STATE ENVIRONMENTAL COMMISSION**

Explanation – Matter in bold blue and italics is *new*; matter in bold red and strikethrough is ~~material to be omitted~~.

AUTHORITY: §§1-318, NRS 445A.425 and 445A.520.

A REGULATION relating to water quality; making various changes in provisions that establish standards for water quality; and providing other matters properly relating thereto.

**P2012-10      STANDARDS FOR TOXIC MATERIALS APPLICABLE TO DESIGNATED WATERS**

Below are two tables of NAC 445A.1236.

1. The first table shows the toxic table as it is now with deletions and additions highlighted. Note the first table is not in alphabetical order.
2. The second table shows the toxic table with all the changed criteria. The second table is alphabetized by chemical. When this petition is approved, this is what the table will look like.

**NAC 445A.1236 Standards for toxic materials applicable to designated waters.**

1. Except as otherwise provided in this section, the standards for toxic materials prescribed in subsection 2 are applicable to the waters specified in 445A.123 to 445A.2234, inclusive. The following criteria apply to this section:

- (a) If the standards are exceeded at a site and are not economically controllable, the commission will review and may adjust the standards for the site.
- (b) If a standard does not exist for each designated beneficial use, a person who plans to discharge waste must demonstrate that no adverse effect will occur to a designated beneficial use. If the discharge of a substance will lower the quality of the water, a person who plans to discharge must meet the requirements of NRS 445A.565.
- (c) If a criterion is less than the detection limit of a method that is acceptable to the Division, laboratory results which show that the substance was not detected will be deemed to show compliance with the standard unless other information indicates that the substance may be present.

2. The standards for toxic materials are:

| Chemical                                 | Municipal<br>or Domestic<br>Supply <sup>(4)</sup><br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l) | Irrigation <sup>(4)</sup><br>(µg/l) | Watering of<br>Livestock <sup>(4)</sup><br>(µg/l) |
|--|---|---|-------------------------------------|---|
| <b>INORGANIC CHEMICALS<sup>(5)</sup></b> |   |   |                                     |   |
| Antimony                                 | 146 <sup>a</sup>  | -                                       | -                                   | -   |
| Arsenic                                  | 50 <sup>b</sup>   | -                                       | 100 <sup>ee</sup>                   | 200 <sup>af</sup>                                 |
| 1-hour average                           | -   | 340 <sup>g-hc,d</sup>                   | -                                   | -   |
| 96-hour average                          | -   | 150 <sup>g-hc,d</sup>                   | -                                   | -   |
| Barium                                   | 2,000 <sup>b</sup>  | -                                       | -                                   | -   |
| Beryllium                                | 0 <sup>a</sup>  | -                                       | 100 <sup>ee</sup>                   | -   |
| <del>hardness &lt;75 mg/l</del>          | -   | -                                       | -                                   | -   |
| <del>hardness &gt;=75 mg/l</del>         | -   | -                                       | -                                   | -   |
| Boron                                    | -   | -                                       | 750 <sup>a</sup>                    | 5,000 <sup>d,j</sup>                              |

| Chemical                                 | Municipal or Domestic Supply <sup>(+)</sup><br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l)  | Irrigation <sup>(+)</sup><br>(µg/l) | Watering of Livestock <sup>(+)</sup><br>(µg/l) |
|--|---|--|-------------------------------------|--|
| Cadmium                                  | 5 <sup>b</sup>  | -  | 10 <sup>a,j</sup>                   | 50 <sup>a,j</sup>                              |
| 1-hour average                           | -   | (1.136672-<br>[ln(hardness)(0.041838)])*<br>e <sup>(1.0166[ln(hardness)] - 3.924)</sup> <sub>g,h,c,d</sub> | -                                   | -  |
| 96-hour average                          | -   | (1.101672-<br>[ln(hardness)(0.041838)])*<br>e <sup>(0.7409[ln(hardness)] - 4.719)</sup> <sub>g,h,c,d</sub> | -                                   | -  |
| Chromium (total)                         | 100 <sup>b</sup>                                      | -  | 100 <sup>a,j</sup>                  | 1,000 <sup>a,j</sup>                           |
| Chromium (VI)                            | -   | -  | -                                   | -  |
| 1-hour average                           | -   | 16 <sub>g,h,c,d</sub>  | -                                   | -  |
| 96-hour average                          | -   | 11 <sub>g,h,c,d</sub>  | -                                   | -  |
| Chromium (III)                           | -   | -  | -                                   | -  |
| 1-hour average                           | -   | (0.316) * e <sup>(0.8190[ln(hardness)] + 3.7256)</sup> <sub>g,h,c,d</sub>                                  | -                                   | -  |
| 96-hour average                          | -   | (0.860) * e <sup>(0.8190[ln(hardness)] + 0.6848)</sup> <sub>g,h,c,d</sub>                                  | -                                   | -  |
| Copper                                   | -   | -  | 200 <sup>a,j</sup>                  | 500 <sup>a,j</sup>                             |
| 1-hour average                           | -   | (0.960) * e <sup>(0.9422[ln(hardness)] - 1.700)</sup> <sub>g,h,c,d</sub>                                   | -                                   | -  |
| 96-hour average                          | -   | (0.960) * e <sup>(0.8545[ln(hardness)] - 1.702)</sup> <sub>g,h,c,d</sub>                                   | -                                   | -  |
| Cyanide                                  | 200 <sup>a</sup>                                      | -  | -                                   | -  |
| 1-hour average                           | -   | 22 <sub>c,g</sub>  | -                                   | -  |
| 96-hour average                          | -   | 5.2 <sub>c,g</sub>   | -                                   | -  |
| Fluoride                                 | -   | -  | 1,000 <sup>a,j</sup>                | 2,000 <sup>a,j</sup>                           |
| Iron                                     | -   | -  | 5,000 <sup>a,j</sup>                | -  |
| 96-hour average                          | -   | 1,000 <sup>bc</sup>  | -                                   | -  |
| Lead                                     | 50 <sup>a,b</sup>                                     | -  | 5,000 <sup>a,j</sup>                | 100 <sup>a,j</sup>                             |
| 1-hour average                           | -   | (1.46203-<br>[ln(hardness)(0.145712)])*<br>e <sup>(1.273[ln(hardness)] - 1.460)</sup> <sub>g,h,c,d</sub>   | -                                   | -  |
| 96-hour average                          | -   | (1.46203-<br>[ln(hardness)(0.145712)])*<br>e <sup>(1.273[ln(hardness)] - 4.705)</sup> <sub>g,h,c,d</sub>   | -                                   | -  |
| Manganese                                | -   | -  | 200 <sup>a,j</sup>                  | -  |
| Mercury                                  | 2 <sup>b</sup>  | -  | -                                   | 10 <sup>a,j</sup>                              |
| 1-hour average                           | -   | 1.4 <sub>g,h,c,d</sub>   | -                                   | -  |
| 96-hour average                          | -   | 0.77 <sub>g,h,c,d</sub>  | -                                   | -  |
| Molybdenum                               | -   | -  | -                                   | -  |
| 1-hour average                           | -   | 6,160 <sup>eh</sup>  | -                                   | -  |
| 96-hour average                          | -   | 1,650 <sup>eh</sup>  | -                                   | -  |
| Nickel                                   | 13.4 <sup>a</sup>                                     | -  | 200 <sup>a,j</sup>                  | -  |
| 1-hour average                           | -   | (0.998) * e <sup>(0.8460[ln(hardness)] + 2.255)</sup> <sub>g,h,c,d</sub>                                   | -                                   | -  |
| 96-hour average                          | -   | (0.997) * e <sup>(0.8460[ln(hardness)] + 0.0584)</sup> <sub>g,h,c,d</sub>                                  | -                                   | -  |
| Selenium                                 | 50 <sup>b</sup>                                       | -  | 20 <sup>a,j</sup>                   | 50 <sup>a,j</sup>                              |
| 1-hour average                           | -   | 20 <sup>a</sup>  | -                                   | -  |
| 96-hour average                          | -   | 5.0 <sup>ac</sup>  | -                                   | -  |
| Silver                                   | -   | -  | -                                   | -  |
| 1-hour average                           | -   | (0.85) * e <sup>(1.72[ln(hardness)] - 6.59)</sup> <sub>g,h,c,d</sub>                                       | -                                   | -  |
| Sulfide (undissociated hydrogen sulfide) | -   | -  | -                                   | -  |
| 96-hour average                          | -   | 2.0 <sup>ac</sup>  | -                                   | -  |
| Thallium                                 | 13 <sup>a</sup>                                       | -  | -                                   | -  |

| Chemical                 | Municipal<br>or Domestic<br>Supply <sup>(+)</sup><br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l)                                  | Irrigation <sup>(+)</sup><br>(µg/l) | Watering of<br>Livestock <sup>(+)</sup><br>(µg/l) |
|--------------------------|---|--|-------------------------------------|---|
| Zinc                     | -   | -  | 2,000 <sup>d,f</sup>                | 25,000 <sup>d,f</sup>                             |
| 1-hour average           | -   | (0.978) * e <sup>(0.84/3[ln(hardness)] + 0.884)</sup> <sub>g,h,c,d</sub> | -                                   | -   |
| 96-hour average          | -   | (0.986) * e <sup>(0.84/3[ln(hardness)] + 0.884)</sup> <sub>g,h,c,d</sub> | -                                   | -   |
| <b>ORGANIC CHEMICALS</b> |   |  |                                     |   |
| Acrolein                 | 320 <sup>a</sup>  | -  | -                                   | -   |
| 1-hour average           | -   | 3 <sup>c</sup>   | -                                   | -   |
| 96-hour average          | -   | 3 <sup>c</sup>   | -                                   | -   |
| Aldrin                   | 0 <sup>a</sup>  | 3 <sup>a</sup>   | -                                   | -   |
| 1-hour average           | -   | 3.0 <sup>c</sup>   | -                                   | -   |
| Chlordane                | 0 <sup>a</sup>  | 2.4 <sup>a</sup>   | -                                   | -   |
| 24-hour average          | -   | 0.0043 <sup>a</sup>  | -                                   | -   |
| 1-hour average           | -   | 2.4 <sup>c</sup>   | -                                   | -   |
| 96-hour average          | -   | 0.0043 <sup>c</sup>  | -                                   | -   |
| 2,4-D                    | 100 <sup>a,b</sup>  | -  | -                                   | -   |
| DDT & metabolites        | 0 <sup>a</sup>  | 1.1 <sup>a</sup>   | -                                   | -   |
| 24-hour average          | -   | 0.0010 <sup>a</sup>  | -                                   | -   |
| Demeton                  | -   | 0.1 <sup>a</sup>   | -                                   | -   |
| 96-hour average          | -   | 0.1 <sup>c</sup>   | -                                   | -   |
| Dieldrin                 | 0 <sup>a</sup>  | 2.5 <sup>a</sup>   | -                                   | -   |
| 24-hour average          | -   | 0.0019 <sup>a</sup>  | -                                   | -   |
| 1-hour average           | -   | 0.24 <sup>c</sup>  | -                                   | -   |
| 96-hour average          | -   | 0.056 <sup>c</sup>   | -                                   | -   |
| Endosulfan               | 75 <sup>a</sup>   | 0.22 <sup>a</sup>  | -                                   | -   |
| 24-hour average          | -   | 0.056 <sup>a</sup>   | -                                   | -   |
| Endrin                   | 0.2 <sup>b</sup>  | 0.18 <sup>a</sup>  | -                                   | -   |
| 24-hour average          | -   | 0.0023 <sup>a</sup>  | -                                   | -   |
| 1-hour average           | -   | 0.086 <sup>c</sup>   | -                                   | -   |
| 96-hour average          | -   | 0.036 <sup>c</sup>   | -                                   | -   |
| Guthion                  | -   | 0.01 <sup>a</sup>  | -                                   | -   |
| 96-hour average          | -   | 0.01 <sup>c</sup>  | -                                   | -   |
| Heptachlor               | -   | 0.52 <sup>a</sup>  | -                                   | -   |
| 24-hour average          | -   | 0.0038 <sup>a</sup>  | -                                   | -   |
| 1-hour average           | -   | 0.52 <sup>c</sup>  | -                                   | -   |
| 96-hour average          | -   | 0.0038 <sup>c</sup>  | -                                   | -   |
| Lindane                  | 4 <sup>b</sup>  | 2.0 <sup>a</sup>   | -                                   | -   |
| 24-hour average          | -   | 0.080 <sup>a</sup>   | -                                   | -   |
| 1-hour average           | -   | 0.95 <sup>c</sup>  | -                                   | -   |
| Malathion                | -   | 0.1 <sup>a</sup>   | -                                   | -   |
| 96-hour average          | -   | 0.1 <sup>c</sup>   | -                                   | -   |
| Methoxychlor             | 100 <sup>a,b</sup>  | 0.03 <sup>a</sup>  | -                                   | -   |
| 96-hour average          | -   | 0.03 <sup>c</sup>  | -                                   | -   |

| Chemical   | Municipal<br>or Domestic<br>Supply <sup>(+)</sup><br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l)   | Irrigation <sup>(+)</sup><br>(µg/l) | Watering of<br>Livestock <sup>(+)</sup><br>(µg/l) |
|--|---|---|-------------------------------------|---|
| Mirex  | 0 <sup>a</sup>  | <b>0.001<sup>a</sup></b>  | -                                   | -   |
| <i>96-hour average</i>                             | -   | <b>0.001<sup>c</sup></b>  | -                                   | -   |
| Parathion  | -   | -   | -                                   | -   |
| 1-hour average                                     | -   | 0.065 <sup>a</sup>  | -                                   | -   |
| 96-hour average                                    | -   | 0.013 <sup>a</sup>  | -                                   | -   |
| Silvex (2,4,5-TP)                                  | 10 <sup>a,b</sup>   | -   | -                                   | -   |
| Toxaphene  | 5 <sup>b</sup>  | -   | -                                   | -   |
| 1-hour average                                     | -   | 0.73 <sup>a</sup>   | -                                   | -   |
| 96-hour average                                    | -   | 0.0002 <sup>a</sup>   | -                                   | -   |
| Benzene  | 5 <sup>b</sup>  | -   | -                                   | -   |
| Monochlorobenzene                                  | 488 <sup>a</sup>  | -   | -                                   | -   |
| m-Dichlorobenzene                                  | 400 <sup>a</sup>  | -   | -                                   | -   |
| o-Dichlorobenzene                                  | 400 <sup>a</sup>  | -   | -                                   | -   |
| p-Dichlorobenzene                                  | 75 <sup>b</sup>   | -   | -                                   | -   |
| Ethylbenzene                                       | 1,400 <sup>a</sup>  | -   | -                                   | -   |
| Nitrobenzene                                       | 19,800 <sup>a</sup>   | -   | -                                   | -   |
| 1,2-dichloroethane                                 | 5 <sup>b</sup>  | -   | -                                   | -   |
| 1,1,1-trichloroethane (TCA)                        | 200 <sup>b</sup>  | -   | -                                   | -   |
| Bis (2-chloroisopropyl) ether                      | 34.7 <sup>a</sup>   | -   | -                                   | -   |
| Chloroethylene (vinyl<br>chloride)                 | 2 <sup>b</sup>  | -   | -                                   | -   |
| 1,1-dichloroethylene                               | 7 <sup>b</sup>  | -   | -                                   | -   |
| Trichloroethylene (TCE)                            | 5 <sup>b</sup>  | -   | -                                   | -   |
| Hexachlorocyclopentadine                           | 206 <sup>a</sup>  | -   | -                                   | -   |
| Isophorone   | 5,200 <sup>a</sup>  | -   | -                                   | -   |
| Trihalomethanes (total) <sup>f</sup>               | 100 <sup>b</sup>  | -   | -                                   | -   |
| Tetrachloromethane<br>(carbon tetrachloride)       | 5 <sup>b</sup>  | -   | -                                   | -   |
| Phenol   | 3,500 <sup>a</sup>  | -   | -                                   | -   |
| 2,4-dichlorophenol                                 | 3,090 <sup>a</sup>  | -   | -                                   | -   |
| Pentachlorophenol                                  | 1,010 <sup>a</sup>  | -   | -                                   | -   |
| 1-hour average                                     | -   | <b><math>\exp\{1.005(\text{pH}) - 4.830\}^a</math></b><br><i><math>e^{1.005(\text{pH}) - 4.869c}</math></i> | -                                   | -   |
| 96-hour average                                    | -   | <b><math>\exp\{1.005(\text{pH}) - 5.290\}^a</math></b><br><i><math>e^{1.005(\text{pH}) - 5.134c}</math></i> | -                                   | -   |
| Dinitrophenols                                     | 70 <sup>a</sup>   | -   | -                                   | -   |
| 4,6-dinitro-2-methylphenol                         | 13.4 <sup>a</sup>   | -   | -                                   | -   |
| Dibutyl phthalate                                  | 34,000 <sup>a</sup>   | -   | -                                   | -   |
| Diethyl phthalate                                  | 350,000 <sup>a</sup>  | -   | -                                   | -   |
| Dimethyl phthalate                                 | 313,000 <sup>a</sup>  | -   | -                                   | -   |
| Di-2-ethylhexyl phthalate                          | 15,000 <sup>a</sup>   | -   | -                                   | -   |
| Polychlorinated Biphenyls<br>(PCBs)                | 0 <sup>a</sup>  | -   | -                                   | -   |
| <b>24-hour average</b>                             | -   | <b>0.014<sup>a</sup></b>  | -                                   | -   |
| <b>96-hour average</b>                             | -   | <b>0.014<sup>c</sup></b>  | -                                   | -   |
| Fluoranthene (polynuclear<br>aromatic hydrocarbon) | 42 <sup>a</sup>   | -   | -                                   | -   |
| Dichloropropenes                                   | 87 <sup>a</sup>   | -   | -                                   | -   |
| Toluene  | 14,300 <sup>a</sup>   | -   | -                                   | -   |
| <i>alpha-Endosulfan</i>                            | -   | -   | -                                   | -   |
| <i>1-hour average</i>                              | -   | <b>0.22<sup>c</sup></b>   | -                                   | -   |
| <i>96-hour average</i>                             | -   | <b>0.056<sup>c</sup></b>  | -                                   | -   |
| <i>beta-Endosulfan</i>                             | -   | -   | -                                   | -   |
| <i>1-hour average</i>                              | -   | <b>0.22<sup>c</sup></b>   | -                                   | -   |
| <i>96-hour average</i>                             | -   | <b>0.056<sup>c</sup></b>  | -                                   | -   |

| Chemical                  | Municipal<br>or Domestic<br>Supply <sup>(+)</sup><br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l) | Irrigation <sup>(+)</sup><br>(µg/l) | Watering of<br>Livestock <sup>(+)</sup><br>(µg/l) |
|---------------------------|---|---|-------------------------------------|---|
| <i>Chlorpyrifos</i>       | -   | -                                       | -                                   | -   |
| <i>1-hour average</i>     | -   | <i>0.083<sup>c</sup></i>                | -                                   | -   |
| <i>96-hour average</i>    | -   | <i>0.041<sup>c</sup></i>                | -                                   | -   |
| <i>4,4'-DDT</i>           | -   | -                                       | -                                   | -   |
| <i>1-hour average</i>     | -   | <i>1.1<sup>e,i</sup></i>                | -                                   | -   |
| <i>96-hour average</i>    | -   | <i>0.001<sup>e,i</sup></i>              | -                                   | -   |
| <i>Diazinon</i>           | -   | -                                       | -                                   | -   |
| <i>1-hour average</i>     | -   | <i>0.17<sup>c</sup></i>                 | -                                   | -   |
| <i>96-hour average</i>    | -   | <i>0.17<sup>c</sup></i>                 | -                                   | -   |
| <i>Heptachlor Epoxide</i> | -   | -                                       | -                                   | -   |
| <i>1-hour average</i>     | -   | <i>0.52<sup>c</sup></i>                 | -                                   | -   |
| <i>96-hour average</i>    | -   | <i>0.0038<sup>c</sup></i>               | -                                   | -   |
| <i>Nonylphenol</i>        | -   | -                                       | -                                   | -   |
| <i>1-hour average</i>     | -   | <i>28<sup>c</sup></i>                   | -                                   | -   |
| <i>96-hour average</i>    | -   | <i>6.6<sup>c</sup></i>                  | -                                   | -   |
| <i>Tributyltin (TBT)</i>  | -   | -                                       | -                                   | -   |
| <i>1-hour average</i>     | -   | <i>0.46<sup>c</sup></i>                 | -                                   | -   |
| <i>96-hour average</i>    | -   | <i>0.072<sup>c</sup></i>                | -                                   | -   |

#### Footnotes

- (1) **Single concentration limits and 24-hour average concentration limits must not be exceeded.** One-hour average and 96-hour average concentration limits may be exceeded only once every 3 years. See reference a.
- (2) Aquatic life standards apply to surface waters only; “hardness” is expressed as mg/L CaCO<sub>3</sub>; and “e” refers to the base of the natural logarithm whose value is 2.718.
- (3) The standards for metals are expressed as total recoverable, unless otherwise noted.

#### References

- a. U.S. Environmental Protection Agency, Pub. No. EPA 440/5-86-001, Quality Criteria for Water (Gold Book) (1986).
- b. Federal Maximum Contaminant Level (MCL), 40 C.F.R. §§ 141.11, 141.12, 141.61 and 141.62 (1992).
- h.c.** U.S. Environmental Protection Agency, National Recommended Water Quality Criteria, **May 2005 2009**.
- g.d.** This standard applies to the dissolved fraction.
- e.e.** U.S. Environmental Protection Agency, Pub. No. EPA 440/9-76-023, Quality Criteria for Water (Red Book) (1976).
- d.f.** National Academy of Sciences, Water Quality Criteria (Blue Book) (1972).
- g.** *This standard is expressed as free cyanide.*
- h.** Nevada Division of Environmental Protection, *Aquatic Life Water Quality Criteria for Molybdenum*, Tetra Tech, Inc., (June 2008).
- e.i.** *This standard applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).*
- j.** The **criteria standard** for trihalomethanes (TTHMs) is the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). See reference b.

**1. This table shows the toxic table with all the changed criteria, it is alphabetized by chemical. When this petition is approved, this is what the NAC 445A.1236 will look like.**

**NAC 445A.1236 Standards for toxic materials applicable to designated waters.**

1. Except as otherwise provided in this section, the standards for toxic materials prescribed in subsection 2 are applicable to the waters specified in 445A.123 to 445A.2234, inclusive. The following criteria apply to this section:

(a) If the standards are exceeded at a site and are not economically controllable, the commission will review and may adjust the standards for the site.

(b) If a standard does not exist for each designated beneficial use, a person who plans to discharge waste must demonstrate that no adverse effect will occur to a designated beneficial use. If the discharge of a substance will lower the quality of the water, a person who plans to discharge must meet the requirements of NRS 445A.565.

(c) If a criterion is less than the detection limit of a method that is acceptable to the Division, laboratory results which show that the substance was not detected will be deemed to show compliance with the standard unless other information indicates that the substance may be present.

2. The standards for toxic materials are:

| Chemical                                 | Municipal or Domestic Supply (µg/l) | Aquatic Life <sup>(1,2)</sup> (µg/l)  | Irrigation (µg/l) | Watering of Livestock (µg/l) |
|--|-------------------------------------|---|-------------------|------------------------------|
| <b>INORGANIC CHEMICALS<sup>(3)</sup></b> |                                     |   |                   |                              |
| Antimony                                 | 146 <sup>a</sup>                    | -   | -                 | -                            |
| Arsenic                                  | 50 <sup>b</sup>                     | -   | 100 <sup>c</sup>  | 200 <sup>f</sup>             |
| 1-hour average                           | -                                   | 340 <sup>c,d</sup>  | -                 | -                            |
| 96-hour average                          | -                                   | 150 <sup>c,d</sup>  | -                 | -                            |
| Barium                                   | 2,000 <sup>b</sup>                  | -   | -                 | -                            |
| Beryllium                                | 0 <sup>a</sup>                      | -   | 100 <sup>c</sup>  | -                            |
| Boron                                    | -                                   | -   | 750 <sup>a</sup>  | 5,000 <sup>f</sup>           |
| Cadmium                                  | 5 <sup>b</sup>                      | -   | 10 <sup>f</sup>   | 50 <sup>f</sup>              |
| 1-hour average                           | -                                   | $(1.136672 - [\ln(\text{hardness})(0.041838])) * e^{(1.0166[\ln(\text{hardness})] - 3.924)c,d}$ | -                 | -                            |
| 96-hour average                          | -                                   | $(1.101672 - [\ln(\text{hardness})(0.041838])) * e^{(0.7409[\ln(\text{hardness})] - 4.719)c,d}$ | -                 | -                            |
| Chromium (total)                         | 100 <sup>b</sup>                    | -   | 100 <sup>f</sup>  | 1,000 <sup>f</sup>           |
| Chromium (VI)                            | -                                   | -   | -                 | -                            |
| 1-hour average                           | -                                   | 16 <sup>c,d</sup>   | -                 | -                            |
| 96-hour average                          | -                                   | 11 <sup>c,d</sup>   | -                 | -                            |
| Chromium (III)                           | -                                   | -   | -                 | -                            |
| 1-hour average                           | -                                   | $(0.316) * e^{(0.8190[\ln(\text{hardness})] + 3.7256)c,d}$                                      | -                 | -                            |
| 96-hour average                          | -                                   | $(0.860) * e^{(0.8190[\ln(\text{hardness})] + 0.6848)c,d}$                                      | -                 | -                            |
| Copper                                   | -                                   | -   | 200 <sup>f</sup>  | 500 <sup>f</sup>             |
| 1-hour average                           | -                                   | $(0.960) * e^{(0.9422[\ln(\text{hardness})] - 1.700)c,d}$                                       | -                 | -                            |
| 96-hour average                          | -                                   | $(0.960) * e^{(0.8545[\ln(\text{hardness})] - 1.702)c,d}$                                       | -                 | -                            |

| Chemical                                 | Municipal or Domestic Supply (µg/l) | Aquatic Life <sup>(1,2)</sup> (µg/l)   | Irrigation (µg/l)  | Watering of Livestock (µg/l) |
|--|-------------------------------------|--|--------------------|------------------------------|
| Cyanide                                  | 200 <sup>a</sup>                    | -  | -                  | -                            |
| 1-hour average                           | -                                   | 22 <sup>c,g</sup>  | -                  | -                            |
| 96-hour average                          | -                                   | 5.2 <sup>c,g</sup>   | -                  | -                            |
| Fluoride                                 | -                                   | -  | 1,000 <sup>f</sup> | 2,000 <sup>f</sup>           |
| Iron                                     | -                                   | -  | 5,000 <sup>i</sup> | -                            |
| 96-hour average                          | -                                   | 1,000 <sup>c</sup>   | -                  | -                            |
| Lead                                     | 50 <sup>a,b</sup>                   | -  | 5,000 <sup>f</sup> | 100 <sup>f</sup>             |
| 1-hour average                           | -                                   | (1.46203-<br>[ln(hardness)(0.145712)])*<br>e <sup>(1.273[ln(hardness)] - 1.460)c,d</sup> | -                  | -                            |
| 96-hour average                          | -                                   | (1.46203-<br>[ln(hardness)(0.145712)])*<br>e <sup>(1.273[ln(hardness)] - 4.705)c,d</sup> | -                  | -                            |
| Manganese                                | -                                   | -  | 200 <sup>i</sup>   | -                            |
| Mercury                                  | 2 <sup>b</sup>                      | -  | -                  | 10 <sup>f</sup>              |
| 1-hour average                           | -                                   | 1.4 <sup>c,d</sup>   | -                  | -                            |
| 96-hour average                          | -                                   | 0.77 <sup>c,d</sup>  | -                  | -                            |
| Molybdenum                               | -                                   | -  | -                  | -                            |
| 1-hour average                           | -                                   | 6,160 <sup>h</sup>   | -                  | -                            |
| 96-hour average                          | -                                   | 1,650 <sup>h</sup>   | -                  | -                            |
| Nickel                                   | 13.4 <sup>a</sup>                   | -  | 200 <sup>i</sup>   | -                            |
| 1-hour average                           | -                                   | (0.998) * e <sup>(0.8460[ln(hardness)] + 2.255)c,d</sup>                                 | -                  | -                            |
| 96-hour average                          | -                                   | (0.997) * e <sup>(0.8460[ln(hardness)] + 0.0584)c,d</sup>                                | -                  | -                            |
| Selenium                                 | 50 <sup>b</sup>                     | -  | 20 <sup>i</sup>    | 50 <sup>i</sup>              |
| 1-hour average                           | -                                   | 20 <sup>a</sup>  | -                  | -                            |
| 96-hour average                          | -                                   | 5.0 <sup>c</sup>   | -                  | -                            |
| Silver                                   | -                                   | -  | -                  | -                            |
| 1-hour average                           | -                                   | (0.85) * e <sup>(1.72[ln(hardness)] - 6.59)c,d</sup>                                     | -                  | -                            |
| Sulfide (undissociated hydrogen sulfide) | -                                   | -  | -                  | -                            |
| 96-hour average                          | -                                   | 2.0 <sup>c</sup>   | -                  | -                            |
| Thallium                                 | 13 <sup>a</sup>                     | -  | -                  | -                            |
| Zinc                                     | -                                   | -  | 2,000 <sup>i</sup> | 25,000 <sup>i</sup>          |
| 1-hour average                           | -                                   | (0.978) * e <sup>(0.8475[ln(hardness)] + 0.884)c,d</sup>                                 | -                  | -                            |
| 96-hour average                          | -                                   | (0.986) * e <sup>(0.8475[ln(hardness)] + 0.884)c,d</sup>                                 | -                  | -                            |
| <b>ORGANIC CHEMICALS</b>                 |                                     |  |                    |                              |
| Acrolein                                 | 320 <sup>a</sup>                    | -  | -                  | -                            |
| 1-hour average                           | -                                   | 3 <sup>c</sup>   | -                  | -                            |
| 96-hour average                          | -                                   | 3 <sup>c</sup>   | -                  | -                            |

| Chemical                           | Municipal<br>or Domestic<br>Supply<br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l) | Irrigation<br>(µg/l) | Watering of<br>Livestock<br>(µg/l) |
|------------------------------------|--|---|----------------------|------------------------------------|
| Aldrin                             | 0 <sup>a</sup>                               | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 3.0 <sup>c</sup>                        | -                    | -                                  |
| alpha-Endosulfan                   | -  | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 0.22 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                    | -  | 0.056 <sup>c</sup>                      | -                    | -                                  |
| beta-Endosulfan                    | -  | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 0.22 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                    | -  | 0.056 <sup>c</sup>                      | -                    | -                                  |
| Benzene                            | 5 <sup>b</sup>                               | -                                       | -                    | -                                  |
| Bis (2-chloroisopropyl) ether      | 34.7 <sup>a</sup>                            | -                                       | -                    | -                                  |
| Chlordane                          | 0 <sup>a</sup>                               | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 2.4 <sup>c</sup>                        | -                    | -                                  |
| 96-hour average                    | -  | 0.0043 <sup>c</sup>                     | -                    | -                                  |
| Chloroethylene (vinyl<br>chloride) | 2 <sup>b</sup>                               | -                                       | -                    | -                                  |
| Chlorpyrifos                       | -  | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 0.083 <sup>c</sup>                      | -                    | -                                  |
| 96-hour average                    | -  | 0.041 <sup>c</sup>                      | -                    | -                                  |
| 2,4-D                              | 100 <sup>a,b</sup>                           | -                                       | -                    | -                                  |
| DDT & metabolites                  | 0 <sup>a</sup>                               | -                                       | -                    | -                                  |
| 4,4'-DDT                           | -  | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 1.1 <sup>c,i</sup>                      | -                    | -                                  |
| 96-hour average                    | -  | 0.001 <sup>c,i</sup>                    | -                    | -                                  |
| Demeton                            | -  | -                                       | -                    | -                                  |
| 96-hour average                    | -  | 0.1 <sup>c</sup>                        | -                    | -                                  |
| Diazinon                           | -  | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 0.17 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                    | -  | 0.17 <sup>c</sup>                       | -                    | -                                  |
| Dibutyl phthalate                  | 34,000 <sup>a</sup>                          | -                                       | -                    | -                                  |
| m-Dichlorobenzene                  | 400 <sup>a</sup>                             | -                                       | -                    | -                                  |
| o-Dichlorobenzene                  | 400 <sup>a</sup>                             | -                                       | -                    | -                                  |
| p-Dichlorobenzene                  | 75 <sup>b</sup>                              | -                                       | -                    | -                                  |
| 1,2-dichloroethane                 | 5 <sup>b</sup>                               | -                                       | -                    | -                                  |
| 1,1-dichloroethylene               | 7 <sup>b</sup>                               | -                                       | -                    | -                                  |
| 2,4-dichlorophenol                 | 3,090 <sup>a</sup>                           | -                                       | -                    | -                                  |
| Dichloropropenes                   | 87 <sup>a</sup>                              | -                                       | -                    | -                                  |
| Dieldrin                           | 0 <sup>a</sup>                               | -                                       | -                    | -                                  |
| 1-hour average                     | -  | 0.24 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                    | -  | 0.056 <sup>c</sup>                      | -                    | -                                  |



| Chemical   | Municipal<br>or Domestic<br>Supply<br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l) | Irrigation<br>(µg/l) | Watering of<br>Livestock<br>(µg/l) |
|--|--|---|----------------------|------------------------------------|
| Di-2-ethylhexyl phthalate                          | 15,000 <sup>a</sup>                          | -                                       | -                    | -                                  |
| Diethyl phthalate                                  | 350,000 <sup>a</sup>                         | -                                       | -                    | -                                  |
| Dimethyl phthalate                                 | 313,000 <sup>a</sup>                         | -                                       | -                    | -                                  |
| 4,6-dinitro-2-methylphenol                         | 13.4 <sup>a</sup>                            | -                                       | -                    | -                                  |
| Dinitrophenols                                     | 70 <sup>a</sup>                              | -                                       | -                    | -                                  |
| Endosulfan   | 75 <sup>a</sup>                              | -                                       | -                    | -                                  |
| Endrin   | 0.2 <sup>b</sup>                             | -                                       | -                    | -                                  |
| 1-hour average                                     | -  | 0.086 <sup>c</sup>                      | -                    | -                                  |
| 96-hour average                                    | -  | 0.036 <sup>c</sup>                      | -                    | -                                  |
| Ethylbenzene                                       | 1,400 <sup>a</sup>                           | -                                       | -                    | -                                  |
| Fluoranthene (polynuclear<br>aromatic hydrocarbon) | 42 <sup>a</sup>                              | -                                       | -                    | -                                  |
| Guthion  | -  | -                                       | -                    | -                                  |
| 96-hour average                                    | -  | 0.01 <sup>c</sup>                       | -                    | -                                  |
| Heptachlor   | -  | -                                       | -                    | -                                  |
| 1-hour average                                     | -  | 0.52 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                                    | -  | 0.0038 <sup>c</sup>                     | -                    | -                                  |
| Heptachlor Epoxide                                 | -  | -                                       | -                    | -                                  |
| 1-hour average                                     | -  | 0.52 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                                    | -  | 0.0038 <sup>c</sup>                     | -                    | -                                  |
| Hexachlorocyclopentadine                           | 206 <sup>a</sup>                             | -                                       | -                    | -                                  |
| Isophorone   | 5,200 <sup>a</sup>                           | -                                       | -                    | -                                  |
| Lindane  | 4 <sup>b</sup>                               | -                                       | -                    | -                                  |
| 1-hour average                                     | -  | 0.95 <sup>c</sup>                       | -                    | -                                  |
| Malathion  | -  | -                                       | -                    | -                                  |
| 96-hour average                                    | -  | 0.1 <sup>c</sup>                        | -                    | -                                  |
| Methoxychlor                                       | 100 <sup>a,b</sup>                           | -                                       | -                    | -                                  |
| 96-hour average                                    | -  | 0.03 <sup>c</sup>                       | -                    | -                                  |
| Mirex  | 0 <sup>a</sup>                               | -                                       | -                    | -                                  |
| 96-hour average                                    | -  | 0.001 <sup>c</sup>                      | -                    | -                                  |
| Monochlorobenzene                                  | 488 <sup>a</sup>                             | -                                       | -                    | -                                  |
| Nitrobenzene                                       | 19,800 <sup>a</sup>                          | -                                       | -                    | -                                  |
| Nonylphenol  | -  | -                                       | -                    | -                                  |
| 1-hour average                                     | -  | 28 <sup>c</sup>                         | -                    | -                                  |
| 96-hour average                                    | -  | 6.6 <sup>c</sup>                        | -                    | -                                  |

|                   |                    |                    |   |   |
|-------------------|--------------------|--------------------|---|---|
| Parathion         | -                  | -                  | - | - |
| 1-hour average    | -                  | 0.065 <sup>a</sup> | - | - |
| 96-hour average   | -                  | 0.013 <sup>a</sup> | - | - |
| Pentachlorophenol | 1,010 <sup>a</sup> | -                  | - | - |

| Chemical                                     | Municipal<br>or Domestic<br>Supply<br>(µg/l) | Aquatic Life <sup>(1,2)</sup><br>(µg/l) | Irrigation<br>(µg/l) | Watering of<br>Livestock<br>(µg/l) |
|--|--|---|----------------------|------------------------------------|
| 1-hour average                               | -  | $e^{1.005(\text{pH}) - 4.869c}$         | -                    | -                                  |
| 96-hour average                              | -  | $e^{1.005(\text{pH}) - 5.134c}$         | -                    | -                                  |
| Phenol                                       | 3,500 <sup>a</sup>                           | -                                       | -                    | -                                  |
| Polychlorinated Biphenyls<br>(PCBs)          | 0 <sup>a</sup>                               | -                                       | -                    | -                                  |
| 96-hour average                              | -  | 0.014 <sup>c</sup>                      | -                    | -                                  |
| Silvex (2,4,5-TP)                            | 10 <sup>a,b</sup>                            | -                                       | -                    | -                                  |
| Tetrachloromethane<br>(carbon tetrachloride) | 5 <sup>b</sup>                               | -                                       | -                    | -                                  |
| Toluene                                      | 14,300 <sup>a</sup>                          | -                                       | -                    | -                                  |
| Toxaphene                                    | 5 <sup>b</sup>                               | -                                       | -                    | -                                  |
| 1-hour average                               | -  | 0.73 <sup>a</sup>                       | -                    | -                                  |
| 96-hour average                              | -  | 0.0002 <sup>a</sup>                     | -                    | -                                  |
| Tributyltin (TBT)                            | -  | -                                       | -                    | -                                  |
| 1-hour average                               | -  | 0.46 <sup>c</sup>                       | -                    | -                                  |
| 96-hour average                              | -  | 0.072 <sup>c</sup>                      | -                    | -                                  |
| 1,1,1-trichloroethane (TCA)                  | 200 <sup>b</sup>                             | -                                       | -                    | -                                  |
| Trichloroethylene (TCE)                      | 5 <sup>b</sup>                               | -                                       | -                    | -                                  |
| Trihalomethanes (total) <sup>j</sup>         | 100 <sup>b</sup>                             | -                                       | -                    | -                                  |

#### Footnotes

- (1) One-hour average and 96-hour average concentration limits may be exceeded only once every 3 years. See reference a.
- (2) Aquatic life standards apply to surface waters only; "hardness" is expressed as mg/L CaCO<sub>3</sub>; and "e" refers to the base of the natural logarithm whose value is 2.718.
- (3) The standards for metals are expressed as total recoverable, unless otherwise noted.

#### References

- a. U.S. Environmental Protection Agency, Pub. No. EPA 440/5-86-001, Quality Criteria for Water (Gold Book) (1986).
- b. Federal Maximum Contaminant Level (MCL), 40 C.F.R. §§ 141.11, 141.12, 141.61 and 141.62 (1992).
- c. U.S. Environmental Protection Agency, National Recommended Water Quality Criteria, 2009.
- d. This standard applies to the dissolved fraction.
- e. U.S. Environmental Protection Agency, Pub. No. EPA 440/9-76-023, Quality Criteria for Water (Red Book) (1976).
- f. National Academy of Sciences, Water Quality Criteria (Blue Book) (1972).
- g. This standard is expressed as free cyanide.
- h. Nevada Division of Environmental Protection, Aquatic Life Water Quality Criteria for Molybdenum, Tetra Tech, Inc., (June 2008).
- i. This standard applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).
- j. The standard for trihalomethanes (THMs) is the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). See reference b.