

## CHEMICAL TOXIC EFFECTS IN DRINKING WATER

### National Interim Primary Drinking Water Standards and the Toxic Effects Associated with the Various Contaminants

| Contaminant | Lowest Concentration Associated with Symptoms mg/L | Toxic Effects or Symptoms   |
|-------------|--|---|
| Arsenic     | 0.05 (mg/L)  | Symptoms range from fatigue and loss of energy to gastrointestinal disturbance, kidney damage, edema, polyneuritis, liver damage and bone marrow injury.  |
| Barium      | 1.0  | May cause nerve block, increased blood pressure due to vasoconstriction. Lung granulomas have also been reported.   |
| Cadmium     | 0.010  | Exposure has caused a syndrome known as "Itai Itai" which is characterized by bone decalcification, proteinuria, glycosuria, and elevated alkaline phosphatase. Other effects reportedly include possible testicular and ovarian necrosis.  |
| Chromium    | 0.05   | Principle effect is tubular necrosis of the kidney. Injection into test animals has reportedly caused development of sarcomas.  |
| Lead        | 0.05   | Effects include motor nerve paralysis, encephalopathy and anemia.   |
| Mercury     | 0.002  | Chronic exposure is toxic to the central nervous system. A variety of effects from ingestion have been reported with local effects of pharyngitis, gastroenteritis, vomiting and blood diarrhea followed by systemic effects of anuria, stomatitis, ulcerative hemorrhagic colitis, and circulatory collapse. |
| Nitrate     | 10   | Severe and occasionally fatal methemoglobinemia has occurred in infants following ingestion of nitrate.   |
| Selenium    | 0.01   | Effects of chronic exposure include depression, nervousness, dermatitis, gastrointestinal disturbance while acute effects include mucosal irritation, dyspnea pulmonary edema, nausea and death.  |

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|---|--|--|
| Silver  | 0.05   | While large doses of colloidal silver may be fatal, the results of chronic exposure are primarily cosmetic with the dominant symptom being a permanent form of argyrosis. Once deposited in tissue it is held indefinitely without evident loss through the usual channels of elimination. |
| Chlorinated Hydrocarbons (Pesticides)                             | .002 Endrin<br>.004 Lindane<br>.1 Methoxychlor<br>.005 Toxaphane | As a rule, the chlorinated hydrocarbons are neurotoxic; effects known range from headache and dizziness to convulsions and death. They also cause myocardial irritability, and hepatic, muscle, and renal necrosis.  |
| Chlorophenoxys (Herbicides)                                       | .01 2, 4-D   | Fibrillary twitching, muscular paralysis, hyporeflexia and loss of sexual potency.   |
|   | 0.01 2, 4, 5-TP<br>Silvex  | Liver and kidney damage, growth retardation testicular damage (animal studies).  |
| Combined radioactivity from RA-228 gross alpha particle activity. | 5pCi/L   | For both it is stated that there "is no harmless level of dose" and that "detrimental effects...proportional to the dose."   |
| Beta particle and photon radioactivity from man-made nuclides.    | 4 mrem/year  | Primary effect is carcinogenic.  |