Fluoride

Fluoride is commonly found in drinking water in the USA. In some cases the fluoride is naturally occurring having dissolved from sodium fluoride and fluorsilicates. Some municipalities add fluoride to their drinking water under the auspices of promoting dental health - a controversial practice no doubt. Although much peer reviewed scientific literature exists to support the fact that below the MCL of 4.0 mg/l consumption of fluoride is safe, many water consumers are not comfortable with the practice and would prefer to remove/reduce the contaminant. Reverse Osmosis and Distillation are the most effective method to reduce fluoride (be sure to look for certifications specific to fluoride reduction) but Activated Alumina also can reduce fluoride in drinking water (EPA - Removal of Fluoride from Drinking Water Supplies by Activated Alumina). Activated Alumina is much more convenient and less expensive than R.O. or Distillation. BestFilters offers water filter models with Activated Alumina cartridges and also Reverse Osmosis units.

Maximum Contaminant Level goals (MCLG) and Maximum Contaminant Level (MCL):
Fluoride MCLG 4.0 mg/l, MCL 4.0 mg/l
Source: http://water.epa.gov/drink/contaminants/index.cfm

What are EPA's drinking water regulations for fluoride?
In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine the level of contaminants in drinking water at which no adverse health effects are likely to occur. These non-enforceable health goals, based solely on possible health risks and exposure over a lifetime with an adequate margin of safety, are called maximum contaminant level goals (MCLG). Contaminants are any physical, chemical, biological or radiological substances or matter in water.

The MCLG for fluoride is 4 mg/L or 4 ppm. EPA has set this level of protection based on the best available science to prevent potential health problems. EPA has set an enforceable regulation for fluoride, called a maximum contaminant level (MCL), at 4 mg/L or 4 ppm. MCLs are set as close to the health goals as possible, considering cost, benefits and the ability of public water systems to detect and remove contaminants using suitable treatment technologies. In this case, the MCL equals the MCLG, because analytical methods or treatment technology do not pose any limitation.

EPA has also set a secondary standard (SMCL) for fluoride at 2 mg/L or 2 ppm. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards. Tooth discoloration and/or pitting is caused by excess fluoride exposures during the formative period prior to eruption of the teeth in children. The secondary standard of 2.0 mg/L is intended as a guideline for an upper boundary level in areas which have high levels of naturally occurring fluoride. It is not intended as a substitute for the lower concentrations (0.7 to 1.2 mg/L) which have been recommended for systems which add fluoride to their water. The level of the SMCL
was set based upon a balancing of the beneficial effects of protection from tooth decay and the undesirable effects of excessive exposures leading to discoloration.

The Phase II Rule, the regulation for fluoride, became effective in 1992. The Safe Drinking Water Act requires EPA to periodically review the national primary drinking water regulation for each contaminant and revise the regulation, if appropriate. EPA reviewed fluoride as part of the Six Year Review and determined that the 4 mg/L or 4 ppm MCLG and 4 mg/L or 4 ppm MCL for fluoride are still protective of human health.

Source: http://water.epa.gov/drink/contaminants/index.cfm

Potential Health Effects from Long-Term Exposure Above the MCL: Bone disease (pain and tenderness of the bones); Children may get mottled teeth

Sources of Contaminant in Drinking Water: Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories

Source: http://water.epa.gov/drink/contaminants/index.cfm

What is fluoride?
Fluoride compounds are salts that form when the element, fluorine, combines with minerals in soil or rocks.

Source: http://water.epa.gov/drink/contaminants/basicinformation/fluoride.cfm

How does fluoride get into my drinking water?
Some fluoride compounds, such as sodium fluoride and fluorosilicates, dissolve easily into ground water as it moves through gaps and pore spaces between rocks. Most water supplies contain some naturally occurring fluoride. Fluoride also enters drinking water in discharge from fertilizer or aluminum factories. Also, many communities add fluoride to their drinking water to promote dental health.

Source: http://water.epa.gov/drink/contaminants/basicinformation/fluoride.cfm

How will fluoride be removed from my drinking water?
The following treatment method(s) have proven to be effective for removing fluoride to below 4 mg/L or 4 ppm: distillation or reverse osmosis.

Source: http://water.epa.gov/drink/contaminants/basicinformation/fluoride.cfm

EPA promulgated the final fluoride rule (R86-1), establishing an enforceable MCL of 4.0 mg/L "to protect against crippling skeletal fluorosis" and a non-enforceable SMCL of 2.0 mg/L "to protect against objectionable dental fluorosis" (R86-1). Activated alumina adsorption and reverse osmosis were identified' as best technologies generally available (BTGA-this is currently known as BAT: best available technology) for purposes of fluoride variances.

Source: http://nepis.epa.gov