

WATER QUALITY BRANCH, PHE DEPARTMENT, JAMMU.

S.NO	Parameters	Maximum Permissible Limit as per IS 10500-2012	Effect if Limit Exceeds
1.	Colour	5 Hazen Unit	Colour in drinking water may be due to the presence of coloured organic substances; the presence of metals such as iron, manganese and copper; or the presence of highly coloured industrial wastes. Although the presence of colour in drinking water may be indirectly linked to health, its primary importance in drinking water is aesthetic .
2.	Turbidity	5 NTU	Turbidity is a concern for both health and aesthetic reasons. In these waters, the particulate matter that creates turbidity can contain toxins, harbour microorganisms and interfere with disinfection. In addition, organic matter in the water can react with disinfectants such as chlorine to create by-products. These by-products may cause adverse health effects.
3.	pH	6.5-8.5	pH of water below 6.5 is acidic and above 8.5 is alkaline in nature. Because pH is related to a variety of other parameters, it is not possible to determine whether pH has a direct relationship with human health. Insofar as pH affects the unit processes in water treatment that contribute to the removal of viruses, bacteria and other harmful organisms, it could be argued that pH has an indirect effect on health.
4.	Total Dissolved Solids	2000 mg/lit	Total dissolved solids (TDS) comprise inorganic salts and small amounts of organic matter that are dissolved in water. The presence of dissolved solids in water may affect its taste . Water with extremely low TDS concentrations may also be unacceptable because of its flat, insipid taste. Certain components of TDS such as chlorides, sulphates, magnesium, calcium and carbonates also affect corrosion or encrustation in water distribution systems. High TDS levels (above 500 mg/L) result in excessive scaling in water pipes, water heaters, boilers and household appliances such as tea kettles and steam irons. Such scaling can shorten the service life of these appliances.
5.	Total Hardness	600 mg/lit	The principal natural sources of hardness in water are sedimentary rocks and seepage and runoff from soils. The cations that are the major contributors to hardness -- calcium and magnesium -- are not of direct public health concern. In areas with hard water, household pipes can become clogged with scale; hard waters also cause incrustations on kitchen utensils and increase soap consumption. Hard water is thus both a nuisance and an economic burden to the consumer. Hard water causes excessive soap consumption ; soft water may result in corrosion of water pipes.
6.	Ammonia	0.5 mg/lit	Ammonia is very soluble in water. Ammonia is present in most waters as a result of the biological degradation of nitrogenous organic matter, although it may also reach groundwater and surface waters from industrial waste discharges. Ingestion of massive doses of ammonium chloride by human adults (52-105 g over three days) resulted in headache, insomnia, nausea, diarrhoea and a failure in glucose tolerance . A dose of 6-8 g daily for 6-9 days resulted in increased urinary output of renal ammonia and urinary magnesium, calcium and phosphate. There seems to be little risk from ammonia in drinking water at the levels normally encountered.
7.	Residual Chlorine	0.2 mg/lit	Most drinking water treatment plants use chlorine as a disinfectant. The use of chlorine in the treatment of drinking water has virtually eliminated waterborne diseases, because chlorine can kill or inactivate most microorganisms commonly found in water. No adverse health effects have been observed in humans from consuming water with high chlorine levels (up to 50 mg/L) over a short period of time. Long-term consumption increases risk for cancer and other health effects.

8.	Fluoride	1.5 mg/lit	Dental fluorosis is the most common effect of fluoride. Skeletal fluorosis is the most serious adverse health effect clearly associated with prolonged exposure to high levels of fluoride in drinking water. Skeletal fluorosis can occur at very high exposure levels.
9.	Arsenic	0.05 mg/lit	Arsenic is classified as a human carcinogen . Early clinical symptoms of acute arsenic intoxication include abdominal pain and vomiting, diarrhea, pain to the extremities and muscles, and weakness with flushing of the skin . These symptoms are often followed by numbness and tingling of the extremities and muscular cramping. Signs of chronic arsenicalism include pigmentation and development of keratoses, peripheral neuropathy, skin cancer, peripheral vascular disease, hypertensive heart disease, cancers of internal organs (bladder, kidney, liver, and lung), alterations in gastrointestinal function (non-cirrhotic hypertension), and an increased risk of mortality resulting from diabetes, have been observed in populations ingesting arsenic-contaminated drinking water.
10.	Iron	0.3 mg/lit	Iron is the fourth most abundant element in the earth's crust and the most abundant heavy metal. At concentrations above 0.3 mg/L, iron can stain laundry and plumbing fixtures and produce undesirable tastes in beverages. The precipitation of excessive iron imparts an objectionable reddish-brown colour to water.
11.	Nitrate	45 mg/lit	<u>Short-term effects:</u> Excessive levels of nitrate in drinking water have caused serious illness and sometimes death . The serious illness in infants is due to the conversion of nitrate to nitrite by the body, which can interfere with the oxygen-carrying capacity of the Childs blood. This can be an acute condition in which health deteriorates rapidly over a period of days. Symptoms include shortness of breath and blueness of the skin. (Blue Baby Syndrome). <u>Long-term:</u> Nitrates and nitrites have the potential to cause diuresis, increased starchy deposits and hemorrhaging of the spleen .
12.	Sulphate	400 mg/lit	Sulphur is a non-metallic element. It is one of the least toxic anions. Studies have shown that drinking water containing sulphates at 3000 mg/L experienced no adverse effects other than diarrhoea. Cattle can tolerate concentrations of sodium sulphate in their drinking water up to 2610 ppm for periods up to 90 days with no signs of toxicity except for changes in methaemo-globin and sulphaemoglobin level. May also cause gastrointestinal irritation.
13.	Selenium	0.01 mg/lit	It is established that selenium is an essential element in human nutrition. It is unclear whether or not selenium can be considered a carcinogen. Studies have indicated that selenium might have anti-carcinogenic properties. Ingestion of large amounts of selenium has been correlated with a variety of clinical disorders in humans.
14.	Zinc	15 mg/lit	Zinc is an essential element for all living things, including man. General symptoms of zinc deficiency in humans include retarded growth, hypogonadism, anorexia, mental lethargy, skin changes, and night blindness . Water containing zinc at concentrations in excess of 5.0 mg/L has an undesirable astringent taste and may be opalescent and develop a greasy film on boiling .
15.	Mercury	0.001 mg/lit	Mercury is a dense, silver-white metal that melts at -38.9°C. Mercury is a toxic element and serves no beneficial physiological function in man. As a result of industrial and agricultural applications, high levels of mercury may occur in localized areas of the environment. The two major responses to mercury poisoning involve neurological and renal disturbances. Acute lethal toxic doses by ingestion of any form of mercury will result in the terminal signs and symptoms, which consist of shock, cardiovascular collapse, acute renal failure, and severe gastrointestinal damage .

16.	Lead	0.01 mg/lit	Lead is the most common of the heavy elements. Lead is present in tap water as a result of dissolution from natural sources or from house hold plumbing systems containing lead in pipes, solder or service connections to homes. The amount of lead from the plumbing system that may be dissolved depends upon several factors, including the acidity (pH), water softness and standing time of the water. Exposure of pregnant women to lead also increases the risk of pre-term delivery. Lead has been classified in Group IIIB--possibly carcinogenic to humans.
17.	Cynide	0.05 mg/lit	Cyanide is toxic and highly lethal to humans. Single oral doses of 50 to 200 mg cyanide have produced fatalities in humans.
18.	Copper	1.5 mg/lit	Copper occurs in nature as the metal and in minerals. In humans, acute copper toxicity has usually been associated with accidental consumption; symptoms include a metallic taste in the mouth, nausea, vomiting, epigastricpain, diarrhoea, jaundice, haemolysis, haemoglobinuria, haematuria, and oliguria . In severe cases, the stool and saliva may appear green or blue; in the terminal phases, anuria, hypotension, and coma precede death.
19.	E-Coli Coliforms	NIL	<i>E. coli</i> is a type of fecal coliform bacteria commonly found in the intestines of animals and humans. The presence of <i>E. coli</i> in water is a strong indication of recent sewage or animal waste contamination. Infection often causes gastrointestinal illness, skin, ear, respiratory, eye, neurologic, and wound infections. The most commonly reported symptoms are stomach cramps, diarrhoea, nausea, vomiting, and low-grade fever.