

## INTERPRETATION OF WATER TESTING RESULTS DOMESTIC PACKAGE

PARAMETER	TREATMENT THRESHOLD	CONCERNS	TREATMENT <sup>&amp;</sup>	NOTES
<i>pH</i> UNITLESS	<b>&lt;6.5</b>	EQUIPMENT CAN BE CORRODED IF THE WATER HAS EXCEEDINGLY LOW (< 5.5) OR HIGH (> 8.5) pH. HIGH pH VALUES (> 8.5) INDICATE ALKALINITY AND MAY POSE A HAZARD OF EXCESS SODIUM). WATER WITH HIGH ACIDITY MAY DISSOLVE IRON FROM PUMPING FACILITIES AND MAINS AND PRODUCE A “RED WATER” PROBLEM.	TO LOWER pH, USE ACID FEEDERS.  TO RAISE pH, USE SODA ASH FEEDERS.	HOUSEHOLD WATER: 6.5-8.5 PPM, EPA SECONDARY DRINKING WATER STANDARD <sup>#</sup> .
<i>Electrical Conductivity (EC), ummhos/cm</i>	<b>NONE</b>	AN INDICATOR OF SALINITY. HIGH CONDUCTIVITY HIGH CONDUCTIVITY (>775) IS AN INDICATION OF (TDS) TOTAL DISSOLVED SALTS. USE THIS VALUE ONLY AS AN INITIAL SCREENING PARAMETER. WHEN CONDUCTIVITY LEVELS ARE HIGH, EVALUATE OTHER INDIVIDUAL CHARACTERISTICS OF THE WATER.	STEAM DISTILLATION, ION EXCHANGE (H+ AND OH SATURATED RESIN ONLY) AND REVERSE OSMOSIS ARE COMMON TREATMENT METHODS FOR REDUCING TDS AND CONDUCTIVITY LEVELS.	EC AND TOTAL DISSOLVED SOLIDS, OR SALTS (TDS) ARE HIGHLY CORRELATED AND USING THRESHOLD VALUES FOR TDS MAY BE MORE APPROPRIATE TO DETERMINE CONCERNS. NO EPA DRINKING WATER STANDARD
TOTAL ALKALINITY EXPRESSED AS mg/l* CaCO <sub>3</sub>	<b>NONE</b>	WATER WITH LOW ALKALINITY IS MORE LIKELY TO BE CORROSIVE AND CAUSE PLUMBING TO DETERIORATE.	ACIDIFYING THE WATER WILL REDUCE ACTUAL ALKALINITY. THE ONLY WAY TO REDUCE THE CALCULATED ALKALINITY IS TO REDUCE THE CALCIUM AND MAGNESIUM LEVELS THROUGH WATER SOFTENING OR DISTILLATION.	NO EPA DRINKING WATER STANDARD.  MEASURE OF CONCENTRATION OF CARBONATES AND BICARBONATES
HARDNESS GRAINS/GALLON ( <i>grs/gal</i> )	<b>&gt;3</b>	HARD WATER CONSUMES SOAP BEFORE LATHER CAN FORM AND INTERFERES WITH ALMOST EVERY CLEANING AND COOKING TASK. IT DEPOSITS FILM ON SURFACES, CAUSING SPOTS AND DINGY CLOTHES. IT CREATES SCALE IN BOILERS, WATER HEATERS AND PIPES.	ADD WATER SOFTENERS OR USE DISTILLATION METHODS	HARDNESS IS CAUSED BY THE PRESENCE OF CALCIUM AND MAGNESIUM IN WATER. NO EPA STANDARD HAS BEEN SET FOR HARDNESS.  HARDNESS CAN BE REPORTED IN MILLIGRAMS/LITER (mg/l)  1 grs/gal = 17.17 mg/l
FLUORIDE mg/l	<b>&gt;1.8</b>	FLUORIDE CONCENTRATIONS OF 1 PPM IN DRINKING WATER PROTECT AGAINST DENTAL CAVITIES. HOWEVER, EXCESSIVE LEVELS MAY CAUSE BROWNISH DISCOLORATION OF THE TEETH. ELEVATED LEVELS MAY CAUSE SKELETAL DAMAGE, BONE DISEASE.	REVERSE OSMOSIS	EPA DRINKING WATER STANDARD IS <b>4.0 mg/l</b>  THE MAXIMUM RECOMMENDED LEVELS FLUORIDE CONCENTRATION DEPENDS ON THE AMOUNT OF WATER CONSUMED AND TEMPERATURE AVERAGE PER YEAR BUT SHOULD NOT EXCEED <b>1.8 mg/l</b>

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CHLORIDE mg/l	<b>NONE</b>	WHEN COMBINED WITH SODIUM, CHLORIDE MAKES DRINKING WATER TASTE SALTY AND MAY MAKE THE WATER MORE CORROSIVE. MAY ALSO BLACKEN OR PIT STAINLESS STEEL.	REVERSE OSMOSIS	HOUSEHOLD WATER: MORE THAN <b>250 PPM</b> MAY CAUSE THE WATER TO TASTE SALTY (EPA SECONDARY DRINKING WATER STANDARD).
SULPHATE (SO <sub>4</sub> ) mg/l	<b>&gt;250</b>	INGESTING WATER WITH GREATER THAN 250 MG/L CAN CAUSE DIARRHEA	REVERSE OSMOSIS	IN LARGE AMOUNTS, SULFATES CAN RESULT IN BITTER TASTES, LAXATIVE EFFECTS AND ROTTEN EGG ODOR FROM HYDROGEN SULFIDE GAS FORMATION.
NITRATE-NITROGEN (NO <sub>3</sub> -N) mg/l	<b>&gt;10</b>	WATER WITH HIGH NITRATE-N CONTENT MAY CAUSE METHEMOGLOBINEMIA (BLUEBABY SYNDROME) AND SHOULD NOT BE USED BY PREGNANT WOMEN OR TO FEED BABIES. HIGH CONCENTRATIONS IN RIVERS, STREAMS AND LAKES ENCOURAGE THE GROWTH OF ALGAE AND OTHER ORGANISMS THAT MAY PRODUCE UNDESIRABLE TASTES AND ODORS IN WATER.	REVERSE OSMOSIS IS CONSIDERED THE BEST OVERALL METHOD FOR NITRATE REDUCTION.	THE ENVIRONMENTAL PROTECTION AGENCY (EPA) HAS SINCE ADOPTED THE <b>10 mg/l</b> STANDARD AS THE MAXIMUM CONTAMINANT LEVEL (MCL) FOR NITRATE-NITROGEN AND <b>1 mg/l</b> FOR NITRITE-NITROGEN FOR REGULATED PUBLIC WATER SYSTEMS.
NITRATE (NO <sub>3</sub> -) mg/l	<b>USE NITRATE-N ABOVE FOR THRESHOLD</b>	FOR MOST WATER QUALITY APPLICATIONS, REPORTING NITRATE AS NITRATE-N IS PREFERRED. SEE CONVERSION FACTORS UNDER NOTES COLUMN	REVERSE OSMOSIS IS CONSIDERED THE BEST OVERALL METHOD FOR NITRATE REDUCTION.	<p>THE ATOMIC WEIGHT OF NITROGEN IS 14.0067 AND THE MOLAR MASS OF NITRATE ANION (NO<sub>3</sub><sup>-</sup>) IS 62.0049 G/MOLE. THEREFORE, TO CONVERT NITRATE-NO<sub>3</sub> (MG/L) TO NITRATE-N (MG/L):            NITRATE-N (MG/L) = 0.2259 x NITRATE-NO<sub>3</sub> (MG/L)</p> <p>AND TO CONVERT NITRATE-N (MG/L) TO NITRATE-NO<sub>3</sub> (MG/L):            NITRATE-NO<sub>3</sub> (MG/L) = 4.4268 x NITRATE-N (MG/L)</p>
COPPER (CU) mg/l	<b>&gt;1.0</b>	COPPER POISONING SYMPTOMS INCLUDE JAUNDICE AND ANEMIA. HIGH LEVELS MAY CAUSE STAINING, BAD TASTES AND CORROSION.	INCREASE PH BY USING SODA ASH (SODIUM CARBONATE). PREVENT CORROSION CREATED BY HIGH DISSOLVED OXYGEN OR TOTAL SALTS BY USING A POLYPHOSPHATE FEEDER SYSTEM.	<b>1.3 ppm</b> , EPA Primary Drinking Water Standard; <b>1.0</b> Secondary Drinking Water

MANGANESE (Mn) mg/l	<b>&gt;0.05</b>	EXCESSIVE MN GIVES WATER A GRAYISH/BLACK APPEARANCE AND MAY STRAIN PLUMBING FIXTURES AND LAUNDRY. MN CAN ALSO MAKE WATER TASTE BAD	1) USE OXIDIZING TREATMENTS TO CONVERT REDUCED MANGANESE TO OXIDIZED MANGANESE, THEN USE PRECIPITATE FILTRATION SYSTEM AND KMNO <sub>4</sub> FEEDERS).  2) FOR LOW LEVELS, USE ION EX-CHANGE WATER SOFTENERS	0.05 mg/l, EPA SECONDARY DRINKING WATER
IRON (Fe) mg/l	<b>0.3</b>	ON EXPOSURE TO AIR, IRON IN GROUNDWATER OXIDIZES TO REDDISH BROWN (OR RUST) WATER THAT MAY STAIN LAUNDRY AND UTENSILS. LARGE QUANTITIES CAN CAUSE UNPLEASANT TASTE AND ENCOURAGE THE GROWTH OF IRON BACTERIA.	1)CONTINUOUS CHLORINATION FOLLOWED BY SEDIMENT FILTER AND CARBON FILTER. 2)AERATE WATER IN A STORAGE TANK OR USE A POTASSIUM PERMANGANATE (KMNO <sub>4</sub> ) FEEDER, THEN SEDIMENT FILTER. 3)USE A SEDIMENT FILTER AND WATER SOFTENER. 4)ADJUST THE PH TO 7.0 OR MORE, THEN TREAT WITH MANGANESE OXIDIZING GREEN SAND FILTER. 5)TRICKLE THE WATER OVER A CRUSHED LIMESTONE BED.	0.3 ppm, EPA Secondary Drinking Water
SODIUM (Na) mg/l	<b>&gt;20 FOR PEOPLE ON LOW SODIUM DIETS</b>	PEOPLE ON LOW-SODIUM DIETS SHOULD CONSULT THEIR PHYSICIANS FOR LEVELS ABOVE <b>20 PPM</b> . HIGH LEVELS MAY CONTRIBUTE TO CORROSION OF COPPER PLUMBING AND METAL FIXTURES.	REVERSE OSMOSIS TREATMENT IS CONSIDERED THE ONLY ECONOMICAL WAY TO REMOVE SODIUM FOR HOUSEHOLD USES. BECAUSE OF ITS COST, REVERSE OSMOSIS IS MORE OFTEN USED JUST FOR DRINKING WATER RATHER THAN FOR THE WHOLE HOUSEHOLD.	<b>20 PPM</b> , EPA SECONDARY WATER STANDARD. PEOPLE ON RESTRICTED SODIUM DIETS MAY BE LIMITED TO 20 PPM.
TOTAL DISSOLVED SOILDS (TDS) mg/l	<b>&gt;500</b>	CAN BE AN INDICATOR OF HIGH SALT LEVELS	REVERSE OSMOSIS	500 PPM, EPA SECONDARY DRINKING WATER STANDARD.  IN CLEAR, NON-TURBID WATERS, TOTAL DISSOLVED SALTS CAN BE USED INTERCHANGEABLY WITH TOTAL DISSOLVED SOILDS.  DETERMINED BY ADDING TOGETHER ALL MEASURED IONS (CATIONS AND ANIONS)
AGGRESSIVE INDEX	<b>&lt;12</b>	CORROSION OF METAL PIPES AND FIXTURES.  GREEN STAINS AROUND WATER OUTLETS SERVICED BY COPPER PIPES	– INCREASE PH TO 8.0 OR 8.5 WITH NEUTRALIZING FILTER OR BY ADDING SODA ASH. A PHOSPHATE FEEDER MAY ALSO BE ADDED IN SEVERE CASES.	HIGHLY AGGRESSIVE < 10 MODERATELY AGGRESSIVE 10-12 NON-AGGRESSIVE >12

& Refer to MP292: "IMPROVING HOME WATER QUALITY" for more information on treatment options

\*MILLIGRAMS/LITER (mg/L) = PARTS PER MILLION (ppm)

#EPA primary standards refer to parameters that affect human health while EPA secondary standards refer to parameters that affect taste, odor and other non-desired aesthetics.