



**PRODUCT MANUAL
FOR DRINKING WATER ACCORDING TO IS 10500 : 2012**

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	Product	:	IS 10500 : 2012
	Title	:	Drinking Water
	No. of Amendments	:	02
2.	Sampling Guidelines:		
a)	Sample size	:	<p>i. For all parameters other than radioactive residues: A sample containing approximately 18 litres of Drinking Water in two parts is adequate.</p> <p>ii. For Parameters concerning Radio-active Residue: A sample of 10 litres is adequate.</p>
3.	List of Test Equipment	:	Please refer ANNEX – A
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – B
5	Possible tests in a day:		
	<p>i. Colour ii. Odour iii. Taste iv. Turbidity v. pH vi. Chloride vii. Total Alkalinity as calcium carbonate viii. Free residual Chlorine.</p>		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 10500 : 2012 with the following scope:		
	Name of the product	:	Drinking Water

ANNEXURE B

LIST OF TEST FACILITIES

A-ORGANOLEPTIC AND PHYSICAL PARAMETERS

SI. No.	Tests	Clause Ref. of IS 10500 : 2012	Referred Test method and Indian Standard	Test /Equipment /Apparatus	Chemical/Reagents
(1)	(2)	(3)	(4)	(5)	(6)
1.	Colour	4, SI No. i) of Table 1	IS 3025 (Part 4) i) Platinum cobalt (Visual Comparison method)	Nessler cylinders, 50 ml Centrifuge or filter assembly, functional pore size 0.45µm	<ul style="list-style-type: none"> • Potassium chloroplatinate • Cobaltous chloride, crystalline • Conc. Hydrochloric acid • Distilled water
			ii) Spectrophotometric method	<ul style="list-style-type: none"> • Spectrophotometer, 400-700 nm with 10 mm absorption cell • Filtration system consisting of filtration flask with side tubes. • Crucible holder • Micrometallic filter crucible, pore 40 µm • Calcined filter aid (Celite 505 or equivalent) • Vacuum system • Refrigerator (recommended) • pH meter • Centrifuge 	<ul style="list-style-type: none"> • Conc. Sulphuric acid • Sodium hydroxide
ii.	Odour	4, SI No. ii) of Table 1	IS 3025 (Part 5)	<ul style="list-style-type: none"> • Wide mouth glass stoppered bottles (approx. 1 lit . capacity) 	<ul style="list-style-type: none"> • Odour free distilled water (or distilled water and column of granulated activated carbon) <ul style="list-style-type: none"> • Hydrochloric acid
iii	pH	4, SI No. iii) of Table 1	IS 3025 (Part 11)	<ul style="list-style-type: none"> • pH meter – with glass and reference electrode (saturated calomel) l.c 0.1 • Magnetic stirrer with polytetrafluoro ethylene coated stirring bar • Thermometer (l.c. 0.5°C 	<ul style="list-style-type: none"> • Standard pH Buffer solutions/tablets (Minimum two different values) OR • Distilled water • Borax (for Borax buffer)

				<ul style="list-style-type: none"> • Beakers 	<ul style="list-style-type: none"> • Potassium dihydrogen phosphate, Sodium hydrogen phosphate and oven (for phosphate buffer) • Potassium hydrogen tartarate (for Tartarate buffer) Potassium hydrogen phthalate (for Phthalate buffer) Potassium tetraoxalate dihydrate (for Calcium hydroxide buffer) • Calcium Carbonate • Platinum dish, • Muffle furnace, • Hot Plate, • Fritted glass filter of medium porosity, polyethylene bottle, Suction pump & fritted glass funnel (for Tetra oxalate buffer) • Methyl orange, methyl red, bromothymol blue, phenolphthalein and alcohol (66%) (for universal indicator) • Thymol blue indicator (acid range) Bromophenol blue indicator • Bromocresol green indicator Methyl red indicator • Bromocresol purple indicator Bromothymol blue indicator Phenol Red indicator • Cresol Red indicator • Thymol Blue (alkali range) indicator • Thymolphthalein indicator • Thymol violet indicator
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					<ul style="list-style-type: none"> • Different buffer solutions of known pH
iv.	Taste	4,Sl. No. iv) of Table 1	IS 3025 (Part 7 & 8)	Breaker (50ml) Water bath Thermometer	Taste and Odour free water 2000 mg/l solution of sodium chloride
v.	Turbidity	4, Sl. No. v) of Table 1	IS 3025 (Part 10)	<ul style="list-style-type: none"> • Sample tubes • Turbidity meter • Volumetric flasks (100 ml) • Membrane filter with pore size not more than 0.45 μm 	<ul style="list-style-type: none"> • Distilled water • Hexamethylene Tetramine • Hydrazine sulphate
vi.	Total dissolved solids	4,Sl No. vi) of Table 1	IS 3025 (Part 16)	<ul style="list-style-type: none"> • Filter: • Filtering Assembly (suitable for type of filter selected) • Drying oven ($180 \pm 2^\circ\text{C}$) • Desiccator • Analytical balance (200 g capacity, l.c. 0.1 mg) • Pipettes • Evaporating dish • Magnetic stirrer, recommended 	

B - CHEMICAL REQUIREMENTS

SI. No.	Tests	Clause Ref. of IS 10500	Referred Method of Tests & Limit of Detection	Test /Equipment /Apparatus*	Chemical/Reagents
(1)	(2)	(3)	(4)	(5)	(6)
i.	Aluminium	4, Sl. No. i) of Table 2	i) IS 3025(Part 55) a) Eriochrome Cyanine R Method Detection range 0.02 to 0.3mg/l;	<ul style="list-style-type: none"> • Spectrophotometer (535 nm with 1cm Cells) • Standard Volumetric Glasswares 	<ul style="list-style-type: none"> • Sulphuric Acid – 0.02 N and 6 N • Ascorbic Acid Solution • Buffer Solution (Sodium Acetate & 1 N Acetic Acid) • Acetic Acid Solution – 1:1 and 1 N • Sodium Hydroxide Solution – 0.1 N and 1N • Stock Eriochrome Cyanine R Dye Solution • Stock Aluminium Solution – 500 µg/l (Aluminium Potassium Sulphate) • Methyl Orange Indicator solution
			b)Atomic Absorption Method (Director) Detection range 5 to 100mg/l	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer with Nitrous Oxide – Acetylene Flame and Nitrous Oxide – Acetylene Flame and Hollow-Cathode Lamp- • Standard Volumetric Glasswares 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc. • Nitric Acid, Conc. • Potassium Chloride Solution • Stock Aluminium Solution - 500 µg/l (Aluminium Potassium Sulphate)
ii.	Ammonia (as total ammonia –N)	4, Sl No. ii) of Table 2	IS 3025 (Part 34) i) Nesslerization method (Refree method)	<ul style="list-style-type: none"> • Spectrophotometer - for use at 400 to 500 nm • Filter photometer -equipped with violet filter and having maximum absorbance at 400-425 nm. • Nessler tubes with rubber stopper • pH meter • Filter paper • Spectrophotometer or filter photometer - for use at 630 nm. 	<ul style="list-style-type: none"> • Zinc Sulphate • Sodium hydroxide • EDTA or Rochelle salt • Nessler’s reagent • Anhydrous ammonium chloride • Potassium Chloroplatinate • Concentrated Hydrochloric Acid • Cobaltous Chloride • Ammonia-free water • Hypochlorous acid reagent

			<p>ii) Phenate Method</p> <ul style="list-style-type: none"> • Magnetic stirrer • Analytical balance <p>iii) Titrimetric method</p> <ul style="list-style-type: none"> • Distillation assembly <p>iv) Ammonia Selective Electrode Method</p> <ul style="list-style-type: none"> • Electrometer • Ammonia-selective electrode • Magnetic stirrer 	<ul style="list-style-type: none"> • Manganou sulphate monohydrate • sodium hydroxide • Phenol • Anhydrous ammonium chloride <ul style="list-style-type: none"> • methyl red indicator • ethyl or isopropyl alcohol. • methylene blue • hydroboric acid • ammonia free water • Standard sulphuric acid titrant <ul style="list-style-type: none"> • Ammonia free water • Sodium hydroxide solution • anhydrous ammonium chloride 	
iii)	Anionic detergents	4, Sl No. iii) of Table 2	<p>Annex K of IS 13428</p> <p>Detection limit about 0.05 mg/l</p>	<ul style="list-style-type: none"> • pH Meter • Spectrophotometer (650 nm) 10mm & 50mm cells • Gas Stripping Apparatus (1 lit Capacity) • Nitrogen Air (20 ltr/hr to 50 ltr/hr) • Reflux Condenser • Fuming hood • Water bath 	<ul style="list-style-type: none"> • Sodium Chloride • Ethyl Acetate • Al₂O₃ • Chloroform • Ethanol • Methanol • Sulphuric Acid • Ethanolic Sodium Hydroxide-0.1 mol/lit (Sodium Hydroxide, Ethanol) • Methylene Blue, Neutral Solution • Methylene Blue, Acidic Solution • Buffer Solution, pH 10 (Sodium Hydrogen Carbonate, Anhydrous Sodium Carbonate) • Phenolphthalein Indicator, Ethanol • Dodecyl Benzene Sulphonic Acid Methyl Ester (Tetrapropylene Type), Stock Standard Solution
iv.	Barium	4, Sl. No iv) of Table 2	i) Annex F of IS 13428	<p>Filter paper and filtration assembly</p> <p>Hot plate/gas burner</p>	<ul style="list-style-type: none"> • Ammonium Dichromate • Ammonium Acetate • Ammonium Hydroxide • Potassium Iodide

				<ul style="list-style-type: none"> • Sodium Thiosulphate(0.1N) • Hydrochloric Acid • Ammonium Chloride • Starch indicator
			ii) IS 15302	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer and • Associated equipment (Burner, Readout mechanism, lamp for Barium, Pressure Reducing valves and vents) • Nitrous oxide burner head • T-junction valve or other switching valve • Air • Acetylene Gas • Nitrous oxide gas
v.	Boron	4, Sl. v) of Table 2	IS 3025 (part 57) i) Titration method	<ul style="list-style-type: none"> • Glassware, 250-ml beakers, glass rods, watch glass, 50-ml burette. • Analytical balance
			ii) Colorimetric curcumin method,	<ul style="list-style-type: none"> • Beakers, polyethylene. • Polyethylene (PTFE) Rods • Spectrophotometer, for use at 555 nm, light path 1 cm. • Water bath
			iii) Flow injection method,	<ul style="list-style-type: none"> • Flow injection system (consisting of a pump, an injector valve with a 100 µl sample loop, a conductivity detector and a recorder or an integrator to measure the peak height/peak area.
				<ul style="list-style-type: none"> • Boric Acid Crystals, AR Grade • Mannitol, AR Grade • Sodium Hydroxide Solution — 0.1 N (CO₂- free). • Phenolphthalein Indicator — 1 percent in 50 percent ethanol. • Methyl Red Indicator — 1 percent in 50 percent ethanol. • Hydrochloric Acid — 6 N.
				<ul style="list-style-type: none"> • Curcumin Reagent • Sulphuric Acid-Acetic Acid Reagent • Sodium Hydroxide Solution • Standard Boron Solution • Acetone and Water Mixture
				<ul style="list-style-type: none"> • Nanopure Water • Mannitol • Stock Boric Acid Solution • Standard Boric Acid Solutions

			<p>iv) Ion chromatographic method, and</p> <p>v) Inductively coupled plasma atomic emission spectrometric method (ICPAES).</p>	<p>Chromatographic system Guard column Separator column</p> <p>Inductively coupled Plasma Atomic Emission Spectrometer Oven Desiccator</p>	<ul style="list-style-type: none"> • Strong .Anion Exchange Resin in Chloride Form <p>Mannitol Sodium hydroxide Sulphuric acid Boric acid</p> <p>Concentrated Nitric acid Boric acid Deionized water</p>
vi)	Calcium	4 Sl. No.vi) of Table 2	<p>i) IS 3025 (Part 40)</p> <p>a)EDTA Titrimetric Method</p>	<ul style="list-style-type: none"> • Hot Plate • Glassware • Polyethylene Bottle 	<ul style="list-style-type: none"> • Sodium Hydroxide Solution – 1N • Hydrochloric Acid – 0.1N • Indicator Solution: Murexide (Ammonium Purpurate) Indicator, Absolute Ethylene Glycol Sodium Chloride OR • Patton and Reeder’s Indicator (Eriochrome Blue Black R, Sodium Sulphate/Potassium Sulphate) • Standard EDTA Solution – 0.01M (Disodium Ethylene Diamine Tetra – Acetate, Standard Zinc Solution, (Or Standard Calcium Solution) Buffer Solution, Eriochrome Black T Indicator Solution • Stock Calcium Solution (Calcium Carbonate, Hydrochloric Acid – 0.1N) • Nitric Acid, Conc
			<p>b)Atomic Absorption Spectrometric Method</p> <p>Detection limit maximum 50mg/l</p>	<ul style="list-style-type: none"> • Atomic Absorption Spectrometer (422.7 nm) with Air/Acetylene or Nitrous Oxide/Acetylene Flame and Hollow Cathode Lamp (Calcium) 	<ul style="list-style-type: none"> • Hydrochloric Acid – 1N and 0.1N • Lanthanum Chloride • Cesium Chloride • Standard Calcium Solution

			c) Permanganate Titration Method	<ul style="list-style-type: none"> • Beakers, Cover Glass, and Glass Rod Filtration Set up (Gooch Crucible with Suction) • Hot plate 	<ul style="list-style-type: none"> • Hydrochloric Acid – 1N • Methyl Red Indicator Solution • Ammonium Oxalate Solution • Urea • Dilute Sulphuric Acid – 1N • Sodium Oxalate • Standard Potassium • Permanganate Solution (Potassium permanganate, sodium oxalate)
18	Chloramines	4, Sl.No.vii) of Table 2	<p>IS 3025 (Part 26) Stabilized Neutral Ortho-Toluidine Method</p> <p>Detection range 0.005 to 0.01mg/l</p>	<ul style="list-style-type: none"> • Spectrophotometer (with light path of 1cm cell or longer for ≤ 1 mg/ l) • Magnetic Stirrer Assembly • Refrigerator (Recommended) • pH meter • Brown Glass Stoppered Bottles 	<ul style="list-style-type: none"> • Distilled Water – Chlorine Demand Free (Distilled Water, Chlorine) • Neutral Ortho-Toluidine Reagent • (Hydrochloric Acid – Conc, Mercuric Chloride, Disodium Salt of EDTA – • Dehydrated, Ortho-Toluidine Dihydrochloride Buffer Stabilizer Reagent (Dipotassium Hydrogen Phosphate, Potassium Dihydrogen Phosphate, Di (2-Ethyl Hexyl) Sulphosuccinate, Diethylene Glycol • Monobutyl ether <p>Potassium Iodide Solution (Potassium Iodide</p> <p>Sulphuric Acid Conc. Sodium Carbonate Sodium Arsenite</p> <p>Standard Chlorine Solution (Chlorine Gas & Distilled Water OR Hypochlorite Distilled Water OR Hypochlorite Solution) Sodium Thiosulphate Solution – 0.025N)</p>

viii).	Chloride	4, Sl. No viii) of Table 2	IS 3025 (Part 32) i) Argentometric Method	<ul style="list-style-type: none"> • Erlenmeyer Flask (250ml) • Burette 	<ul style="list-style-type: none"> • Potassium Chromate Indicator Solution (Potassium Chromate, Silver Nitrate) • Standard Silver Nitrate Solution – 0.01 N (silver nitrate, sodium chloride) • Standard Sodium Chloride Solution – 0.01 N (Sodium Chloride) • Aluminium Hydroxide Suspension (Aluminium Potassium Sulphate or Aluminium Ammonium Sulphate, Conc Ammonium Hydroxide) • Phenolphthalein Indicator Solution • Sodium Hydroxide – 1N • Sulphuric Acid – 1N • Hydrogen Peroxide – 30%
			ii) Mercuric Nitrate Method	<ul style="list-style-type: none"> • Erlenmeyer Flask (250 ml) • Microburette (5 ml with l.c. 0.01ml) • Refrigerator • pH meter 	<ul style="list-style-type: none"> • Standard Sodium Chloride Solution, 0.01N • Nitric Acid, 0.1N • Sodium Hydroxide, 0.1N • Indicator – Acidifier Reagent (S-Diphenyl- carbazone, Conc. Nitric Acid, Xylene Cyanol FF, Ethyl Alcohol or Isopropyl Alcohol) • Standard Mercuric Nitrate Solution, 0.01N (Mercuric Nitrate, Conc. Nitric Acid, Sodium Bicarbonate, Std. Sodium Chloride Solution) • Mixed Indicator Reagent (Diphenylcarbazone, Bromo Phenol Blue, Ethyl Alcohol or Isopropyl Alcohol) • Standard Mercuric Nitrate Solution – 0.1N

			iii) Potentiometric Method	<ul style="list-style-type: none"> • Glass and Silver- Silver Chloride Electrodes • Electronic Voltmeter • Mechanical Stirrer 	<ul style="list-style-type: none"> • Standard Sodium Chloride Solution (0.01N) • Nitric Acid-Conc • Standard Silver Nitrate Solution (0.01N) • Pretreatment Reagent (Sulphuric Acid, Hydrogen Peroxide, Sodium Hydroxide – 1 N)
ix.	Copper	4, SI No. ix) of Table 2	i) IS 3025 (Part 42)		
			a) Neocuproine Method Detection range 0.05 to 5.0mg/l	<ul style="list-style-type: none"> • Spectrophotometer & 1cm cell Hot plate • Separating funnels (125 ml) • Conical flasks 	<ul style="list-style-type: none"> • Ammonium Hydroxide • Chloroform, AR Grade • Hydrochloric acid, Conc. • Hydroxylamine Hydrochloride • Isopropyl Alcohol • Neocuproine • Double Distilled water • Nitric Acid, Conc. • Sulphuric Acid, Conc. • Hydrated Sodium Citrate • Stock copper (II) solution 200µg/ml (Pure Copper Metal, hot plate) • Hydrogen Peroxide
			b) Atomic Absorption Method (Direct) Detection range 0.02 to 5.0mg/l	<ul style="list-style-type: none"> • Atomic Absorption Spectro- photometer with air-acetylene flame & Copper Hollow Cathode lamp 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc • Nitric Acid, Conc. • Dilute Sulphuric Acid • Stock copper (II) solution – 1.0mg/ml • (Pure Copper metal & hot plate)

			<p>c) Atomic Absorption Method (Chelation Extraction) Detection range 0.02 to 5.0mg/l</p>	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer with air-acetylene flame • Copper Hollow Cathode Lamp Separating Funnel • Volumetric Flasks • Distillation Assembly 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc. • Nitric Acid, Conc. • Pyrrolidine • Dithiocarbamic acid • Methyl Isobutyl Ketone, AR grade • Carbon Disulphide • Sodium Hydroxide • Distilled water • Water Standard MIBK • Bromophenol Blue • Ethanol or Isopropanol • Stock copper (II) solution – 1.0mg/ml (Pure Copper metal & hot plate)
			<p>d) Differential Pulse Anodic Stripping Voltametry Detection range 0.01 to 0.1mg/l</p>	<ul style="list-style-type: none"> • Polarograph capable of Performing differential pulse work • Hanging Mercury Drop electrode • Platinum Counter Electrode • Saturated Calomel Reference Electrode • Magnetic Stirrer • Control unit with Stirring Bar • Scrubber Assembly • Whatman Filter Paper No. 40 • Nitrogen Gas 	<ul style="list-style-type: none"> • Hydrochloric Acid Conc. (Spectro Grade) • Nitric Acid-Conc. (Spectro Grade) • Sulphuric Acid Conc. • Pure Copper Metal • Granular Zinc • Mercury

<p>x.</p>	<p>Flouride</p>	<p>4, Sl. No. x) of Table 2</p>	<p>IS 3025(Part 60) i) Zirconium alizarin Method Detection range 0.05 to 1.0 mg/l</p>	<ul style="list-style-type: none"> • Nessler Tubes (100ml)Distillation Apparatus • Refrigerator (Recommended) • Heating mantle 	<ul style="list-style-type: none"> • Thiosulphate Solution (0.1 N) • Standard Sodium Fluoride Solution (1ml = 0.01 mg F) • Zirconium Oxychloride OR Zirconium Oxynitrate • Alizarin Sodium Monosulphonate (AlizarinS) • Conc. Hydrochloric Acid • Conc. Sulphuric Acid • Silver Sulphate • Perchloric Acid • Phenolphthalein Indicator • Sodium Hydroxide Solution
			<p>ii) Electro Chemical Probe Method Detection range 0.2mg to 2.0 g/l</p>	<ul style="list-style-type: none"> • Millivolt Meter • Fluoride Ion – Selective Electrode • Reference Electrode – Either a calomel electrode, filled with saturated Potassium Chloride (KCl) Solution or a Silver / Silver Chloride Electrode • Measuring Cells – 100ml(Polypropylene fitted with thermostated jacket) • Water Bath • Magnetic Stirrer with a polytetrafluoroethylene(PTFE) • Polyethylene Beaker • pH meter • Standard Volumetric • Glasswares • Desiccator • Screw Capped Polyethylene Container • Plastic Bottle 	<ul style="list-style-type: none"> • Sodium Hydroxide- 5 M • Total Ionic Strength Adjustment Buffer (TISAB)-[Sodium Chloride, Glacial Acetic Acid, Sodium Hydroxide, CDTA(trans -1,2- diaminocyclohexane – N,N,N',N' tetra acetic acid)] • Fluoride, Stock Solution, 1000mg/1 (Sodium Fluoride) <p>Note : Purity of the reagent – Unless specified otherwise, only pure chemicals & Fluoride free distilled water shall be used in tests.</p>

<p>xi)</p>	<p>Residual Free Chlorine</p>	<p>4, Sl No. xi) of Table 2</p>	<p>IS 3025 (Part 26) Stabilized Neutral Ortho-Toluidine Method</p> <p>Detection range 0.005 to 0.01mg/l</p>	<ul style="list-style-type: none"> • Spectrophotometer (with light path of 1cm cell or longer for ≤ 1 mg/ l) • Magnetic Stirrer Assembly • Refrigerator (Recommended) • pH meter • Brown Glass Stoppered Bottles 	<ul style="list-style-type: none"> • Distilled Water – Chlorine Demand Free (Distilled Water, Chlorine) • Neutral Ortho-Toluidine Reagent • (Hydrochloric Acid – Conc, Mercuric Chloride, Disodium Salt of EDTA – • Dehydrated, Ortho-Toluidine Dihydrochloride Buffer Stabilizer Reagent (Dipotassium Hydrogen Phosphate, Potassium Dihydrogen Phosphate, Di (2-Ethyl Hexyl) Sulphosuccinate, Diethylene Glycol • Monobutyl ether <p>Potassium Iodide Solution (Potassium Iodide</p> <p>Sulphuric Acid Conc. Sodium Carbonate Sodium Arsenite</p> <p>Standard Chlorine Solution (Chlorine Gas & Distilled Water OR Hypochlorite Distilled Water OR Hypochlorite Solution) Sodium Thiosulphate Solution – 0.025N)</p>
<p>xii).</p>	<p>Iron</p>	<p>4, Sl. No xii) of Table 2</p>	<p>i) IS 3025 (Part 53)</p> <p>a) 1,10 Phenanthroline Method</p> <p>Detection range 0.075 to 0.5mg/l</p>	<ul style="list-style-type: none"> • Spectrophotometer • Std. volumetric glass wares • Hot Plate • Fuming Hood • 0.45μ m Membrane Filter with Filtration Assembly 	<ul style="list-style-type: none"> • Amalgamated Zinc (Granular Zinc and Mercury) • Ammonium Meta Vanadate Distilled water • Hydrochloric Acid-Conc. (Containing less than 0.00005% iron) • HydroxylamineHydrochloride Ammonium • Acetate Glacial Acetic Acid • Sodium Acetate • 1,10 Phenanthroline Monohydrate • Stock Iron Solution 1ml=200μg of Fe (Conc. Sulphuric Acid, • Ferrous Ammonium Sulphate, • Potasssium Permanganate)

					<ul style="list-style-type: none"> • Std. Iron Solution (1.0 ml=1.0µg of Iron) Di-isopropyl Ether
			<p>b) Atomic Absorption Method (DIRECT)</p> <p>Detection range 0.1 to 10 mg/l</p>	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer • Air Acetylene Flame • Iron Hollow Cathode Lamp or Electrodeless discharge lamp for use at 248.3nm • Volumetric Flasks 	<ul style="list-style-type: none"> • Distilled water • Hydrochloric Acid, Conc. Nitric Acid, Conc. • Sulphuric Acid, Conc. • Calcium Chloride Solution (Calcium Carbonate, Hydrochloric acid) • Stock Iron Solution (1.0 ml=100µg of Fe) (Pure iron wire, Hydrochloric acid Nitric Acid)
xiii)	Magnesium	4, SI No. xiii) of Table 2	<p>i) IS 3025 (Part 46) with Amendment 1 & 2</p> <p>a) Gravimetric Method</p> <p>Detection limit more than 1 mg/l</p>	<ul style="list-style-type: none"> • Vacuum Pump • Filter Flasks • Filter Crucibles (medium porosity, 30 ml) • Muffle Furnace • Hot plate • Volumetric Flasks • Glasswares 	<ul style="list-style-type: none"> • Methyl Red Indicator • Hydrochloric Acid • Ammonium Oxalate • Ammonium Hydroxide • Nitric Acid, Conc • Diammonium Hydrogen Phosphate • Urea
			<p>b) Volumetric Method (EDTA)</p>	<ul style="list-style-type: none"> • Hot plate • Volumetric Flasks • Glasswares 	<ul style="list-style-type: none"> • Indicator Solutions i) Patton and Reeder Reagent, Sodium Chloride/Potassium Chloride ii) Murexide (Ammonium Purpurate), Absolute Ethylene Glycol, Sodium Chloride iii) Eriochrome Black T Indicator (EBT Indicator), Hydroxylamine, Hydrochloride, Ethanol/Methanol • Standard Zinc Solution – 0.01M (Pure Zinc Dust/Granules – 99.9% Pure; Hydrochloric Acid)

					<ul style="list-style-type: none"> • Buffer Solution (Ammonium Chloride, Ammonia, Sodium Hydroxide-1N) • Standard Ethylene Diamine Tetra Acetic Acid (EDTA) Solution – 0.001M (Disodium Ethylene Diamine Tetra Acetate Dihydrate, Standard Zinc Solution) • Triethanolamine Solution – 10% Potassium Cyanide • Hydroxylamine Hydrochloride
			<p>c) Atomic Absorption Method</p> <p>Detection limit max 5 mg/l</p>	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer (285.2 nm) with Air-Acetylene Flame or Nitrous Oxide-Acetylene Flame and Hollow Cathode Lamp (Magnesium) • Polyethylene Bottles 	<ul style="list-style-type: none"> • Hydrochloric Acid – 1N and 0.1N • Lanthanum Chloride (Lanthanum Oxide, Hydrochloric Acid, Conc) • Cesium Chloride • Standard Magnesium Solution (1000mg/l) (Magnesium Oxide, Hydrochloric Acid)
xiv.	Manganese	4, SI. No. iv) Table 2	<p>i) IS 3025 (Part 59)</p> <p>a) Periodate Colorimetric Method</p> <p>Detection limit up to 0.2mg/l</p>	<ul style="list-style-type: none"> • Nessler’s Tubes • Beakers • Hot Plate • Volumetric flask • Pipettes • Conical Flasks • Burette 	<ul style="list-style-type: none"> • Sulphuric Acid • Hydrogen Peroxide (30%) • Nitric Acid, Conc. • Stabilized Distilled Water OR Distillation Assembly, OR • Distilled water, • Potassium Permanganate and Dil Sulphuric Acid • Phosphoric Acid (sp. Gr. 1.75) • Potassium Periodate • Std. Manganese Solution (1ml=0.02 mg of Mn) (Standard 0.1 N Potassium Permanganate solution, saturated solution of sulphur dioxide)

			<p>b) Formaldoxime</p> <p>Spectrometric Method</p> <p>Detection limit between 0.01mg/l to 5 mg/l</p>	<ul style="list-style-type: none"> • Spectrophotometer • Glass Bottle • Autoclave 	<ul style="list-style-type: none"> • Fluoride Free Water • Potassium Peroxodisulphate or Sodium Peroxodisulphate • EDTA Tetrasodium Salt, Solution, c(EDTA) • Sodium Hydroxide • Hydroxyl ammonium Chloride • Formaldehyde • Ammonia Solution • Ammonium Iron (II) Sulphate Hexahydrate Solution • Sulphuric Acid, conc. • Manganese Monohydrate (for Standard Mn Solution)
xv	Mineral Oil	4, Sl No. xv) of Table 2	<p>Clause 6 of IS 3025 (Part 39)</p> <p>Partition Infra-Red Method</p> <p>Detection limit 0.5 to 100 mg/l</p>	<ul style="list-style-type: none"> • Separating Funnel (1lit) with Teflon or Equivalent Stopcock • Infra-Red Spectrophotometer – Double Beam, Recording type • Cells – Infra-Red, Silica • Filter Paper – Whatman No.40 or Equivalent, 11cm Diameter • Analytical Balance 	<ul style="list-style-type: none"> • Hydrochloric Acid • Hexane • Sodium Sulphate, Anhydrous • Reference Oil (Iso-Octane, Hexadecane, Benzene) • Trichlorotrifluoroethane
xvi.	Nitrate (as NO ₃)	4, Sl. No. xvi) of Table 2	IS 3025 (Part 34)		

			<p>i) Cadmium Reduction Method</p> <p>Detection limit maximum 0.1 mg/l</p>	<ul style="list-style-type: none"> • Reduction Column • Colorimeter OR • Spectrophotometer OR • Filter photometer Glass wool • 0.45 µm pore diameter membrane filter • Refrigerator 	<ul style="list-style-type: none"> • Distilled water • Nitrate free water • Cadmium granules (40 – 60 mesh) • Hydrochloric Acid (6N) • Copper Sulphate Solution • Sulphanilamide • Conc. Hydrochloric Acid • N-(1-naphthyl)-Ethylenediamine dihydrochloride (NED) Dihydrochloride) • Ammonium Chloride • Disodium Ethylene diamine tetra acetate • Ammonia Solution • Copper sulphate Solution – 2% Stock nitrate solution – 100µg/ml • (Potassium Nitrate & Chloroform) • Chloroform • Stock nitrite solution - 100µg/ml • (Potassium Nitrite & Chloroform) <ul style="list-style-type: none"> • Nitrite free water
			<p>ii) Chromotropic Acid Method</p>	<ul style="list-style-type: none"> • Spectrophotometer • Standard laboratory glasswares 	<ul style="list-style-type: none"> • Nitrate free water • Stock Nitrate Solution - 100µg/ml (Potassium Nitrate, Chloroform) • Standard Nitrate solution – 10.0µg/ml • Sulphite Urea Reagent (Urea & Anhydrous sodium Sulphite) • Antimony reagent (Antimony metal, Conc. Sulphuric acid) • Chromotropic Acid Reagent (Purified chromotropic Acid crystals, Conc. Sulphuric Acid) • Sulphuric Acid, Conc. Nitrate free

			<p>iii) Devarda's Alloy Reduction Method</p> <p>Detection limit minimum 2 mg/l</p>	<ul style="list-style-type: none"> • Distillation Assembly (Kjeldahl Assembly) • Measuring Scoop spectrophotometer 	<ul style="list-style-type: none"> • Ammonia Free Water • Borate Buffer Solution (0.1N Sodium Hydroxide, 0.025M Sodium Tetraborate) • Sodium Hydroxide – 6 N • Devarda's Alloy – 20 mesh with less than 0.005 percent Nitrogen • Mixed indicator Solution (Methyl Red indicator, Ethyl alcohol/Isopropyl alcohol, Methylene Blue) • Indicating Boric Acid Solution (Hydroboric Acid, mixed indicator solution) • Std. Sulphuric Acid Titrant - 0.02 N • Nessler's Reagent (Mercuric Iodide, Potassium Iodine. Sodium Hydroxide) • Stock Ammonia Solution -1.22mg ammonia/ ml (Anhydrous Ammonium ammonia/ ml (Anhydrous Ammonium Chloride) • Standard Ammonia Solution
xviii	Selenium	4, Sl. No. xviii) of Table 2	<p>i) IS 3025 (Part 56) a) Spectrophotometric Method (Diamino naphthalene Method)</p> <p>Detection limit minimum 0.01mg/l</p>	<ul style="list-style-type: none"> • Spectrophotometer (480nm, light path of 1cm) • Volumetric Glasswares • Separating Funnel (250ml) Preferably • Fluorocarbon Stopcock • Water Bath – Thermostatically Controlled • pH Meter • Centrifuge • Centrifuge Bottles with Fluorocarbon Screw Cap 	<ul style="list-style-type: none"> • Stock Selenium Solution – 1.0mg/ml (Sodium Selenite, Hydrochloric Acid) • Hydrochloric Acid – 0.1N • Ammonium Hydroxide, 1:1 Cyclohexane • 2,3 – Diaminonaphthalene (DAN) • Hydroxylamine Hydrochloride • Sodium Salt of EDTA • Amberlite XAD -8 or Equivalent Resin • Hydrochloric Acid, Conc • Potassium Hydroxide

			b) Atomic absorption Spectrometric Method (Hydride Technique)	<ul style="list-style-type: none"> • Atomic Absorption Spectrometer (196.0 nm) Fitted with Hydride System and Hollow Cathode Lamp/Electrodeless Discharge Lamp • Gas (Argon or Nitrogen) • Glasswares Decomposition Apparatus (Round Bottom Flask, Reflux Condenser, Condensate Reservoir) 	<ul style="list-style-type: none"> • Nitric Acid • Sulphuric Acid • Hydrochloric Acid • Hydrogen Peroxide • Sodium Hydroxide • Sodium Tetrahydro borate • Selenium Stock Solution (1mg/ml) (Selenium Dioxide)
xix.	Silver	4, Sl. No. xix) of Table 2	Annex J of IS 13428	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer with Oxidizing Air Acetylene Flame 	<ul style="list-style-type: none"> • Deionised Distilled Water (Ion Exchange Column & Distilled Water) • Nitric Acid – Redistilled • Hydrochloric Acid – Redistilled • Silver Std. Solution (Silver Nitrate) • Lanthanum Chloride • Lanthanum Stock Solution (Lanthanum Oxide, Hydrochloric Acid) • Ammonium Pyrrolidine Dithiocarbamate solution) • Methyl isobutyl ketone
xx	Sulphate	4, Sl. No. xx) of Table 2	IS 3025 (Part 24) i) Gravimetric Method Detection limit more than 10mg/l	<ul style="list-style-type: none"> • Steam Bath • Drying Oven (thermostatically controlled) • Muffle Furnace • Desiccator • Analytical Balance (1.c.0.1mg) • Filter Paper (Preferably Whatman No.42) • Silica or Porcelain Crucible (max pore size of 5 microns) • Ion Exchange Column • Filter (0.45 μ m) • Platinum Dish 	<ul style="list-style-type: none"> • Methyl Red Indicator • Hydrochloric Acid • Barium Chloride • Silver Nitrate • Nitric Acid • Ion Exchange Resin (Amberlite IR-120 or Equivalent)

			<p>ii) Thorin Method</p> <p>Detection range 5 to 150mg/l</p>	<ul style="list-style-type: none"> • White Porcelain Basin • Burette • Ion Exchange Column • Filter – 0.45µm 	<ul style="list-style-type: none"> • Ethyl Alcohol • Ammonium Hydroxide (Ammonia-Conc and Distilled Water) • Hydrochloric Acid • Thorin (2,2 – Hydroxy – 3,6 – Disulpho – 1 – Naphthylazo Benzene Arsenic Acid) • Ion Exchange Resin (Amberlite IR-120 or Equivalent) • Stock Sulphate Solution – 100 mg/l (Anhydrous Sodium Sulphate)
			<p>iii) Turbidity Method</p> <p>Detection limit 1 to 40mg/l</p>	<ul style="list-style-type: none"> • Turbidity Meter or Spectrophotometer` (420nm) • Glass Apparatus • Hot Plate • Refrigerator (recommended) • Filter – 0.45µm 	<ul style="list-style-type: none"> • Barium Chloride – Standard Solution (Barium chloride in hydrochloric acid ammonia) • Barium Chloride • Gelatin Powder • Glycerol • Hydrochloric Acid, Conc • Sodium Chloride • Ethyl or Isopropyl Alcohol • Anhydrous Sodium Sulphate • Stock sulphate solution – 100mg/l
xxi	Sulphide	4, Sl. No. xxi) of Table 2	<p>IS 3025 (Part 29)</p> <p>i) Iodometric Method</p> <p>Detection limit above 1 mg/l</p>	<ul style="list-style-type: none"> • Glass Fibre Filter Paper. • Reaction Flask (1 lit capacity with 2 hole stopper fitted with gas-diffusion tube. • Absorption flasks (250ml Capacity) (2 No's) • Nitrogen/Carbon dioxide gas cylinder Or Carbon dioxide gas generator 	<ul style="list-style-type: none"> • Zinc acetate solution – 2N • Sulphuric Acid, Conc. • Standard Iodine solution – 0.025 N • (Potassium Iodide, Iodine) Hydrochloric Acid, Conc. Standard Thiosulphate Solution - 0.025 N (Sodium thiosulphate, Sodium Hydroxide/Chloroform) • Starch indicator solution (Starch, salicylic acid, toluene) • Aluminium Chloride solution – 6N • Sodium hydroxide – 6N
			<p>ii) Methylene blue Method</p>	<ul style="list-style-type: none"> • Spectrophotometer (664 nm) or filterphotometer (600 nm). • Matched test tubes • Droppers 	<ul style="list-style-type: none"> • N, N-dimethyl-p-Phenylene Diamine oxalate • Sulphuric Acid, Conc. & 1:1 solution • Ferric Chloride

			Detection limit upto 20 mg/l	<ul style="list-style-type: none"> • Dark glass bottle. 	<ul style="list-style-type: none"> • Diammonium Hydrogen Phosphate • Methylene Blue • Standard Sulphide Solution • Zinc acetate
xxii	Total Alkalinity	4, Sl. No. xxii) of Table 2	IS 3025 (Part 23) with Amendment 1& 2 i) Indicator Method Detection range 0.5 to 500mg/l	<ul style="list-style-type: none"> • pH Meter • Burette • Magnetic Stirrer Assembly • Beaker 	Distilled Water <ul style="list-style-type: none"> • Sulphuric Acid, Conc • Sulphuric Acid, 0.02 N • Phenolphthalein Indicator • Mixed Indicator Solution (Methyl Red, Bromocresol Green, Ethyl or Isoprophyl Alcohol)
			ii) Potentiometric Method Detection range 0.5 to 500mg/l	<ul style="list-style-type: none"> • Potentiometer • Glasswares 	<ul style="list-style-type: none"> • Standard Sulphuric Acid – 0.02N
	Total hardness	4, Sl.No.xxiii of Table 2	IS 3025 (Part 21) i) EDTA Method ii) Method based on Analytical Data (Carbonate Hardness and Non carbonate Hardness)	<ul style="list-style-type: none"> • pH meter • polyethylene bottle 	<ul style="list-style-type: none"> • Ammonium Chloride • Concentrated Ammonium Hydroxide • Magnesium Salt of EDTA • Disodium Salt of EDTA • Distilled Water • Standard Calcium Solution • Eriochrome Black T Indicator Solution • Standard EDTA Solution Inhibitors <ul style="list-style-type: none"> • Hydroxylamine Hydrochloride Solution Potassium Ferrocyanide Crystals <ul style="list-style-type: none"> • Sodium Sulphide Inhibitor • Sodium Cyanide Solution

xxiv.	Zinc	4, Sl. No. xxiv) of Table 2	IS 3025 (Part 49) with Am 1 i) Zincon Method Detection range 0.02 to 5 mg/l	Spectrophotometer (620 nm with 1cm cells)	<ul style="list-style-type: none"> • Sodium Hydroxide • Potassium Cyanide • Cyclohexanone • Distt. Water • Zincon • Methanol • Sodium Ascorbate • Borate Buffer Solution (Sodium Hydroxide, Potassium Chloride, Boric Acid) • Hydrochloric Acid, Conc. • Zinc Sulphate
			ii) Atomic Absorption Method (Direct) Detection range 0.01 to 2.0mg/l	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer with Air-Acetylene Flame • Hollow Cathode Lamp Or Electrodeless discharge lamp 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc. • Nitric Acid, conc. • Stock Zinc Solution – 1.0mg/m (Zinc Granules/Zinc Oxide)
			iii) Atomic Absorption Method(Chelation-Extraction) Detection range 0.001 to 0.2mg/l	<ul style="list-style-type: none"> • Atomic Absorption Spectrophotometer with Air-Acetylene Flame • Hollow Cathode Lamp 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc. • Nitric Acid, Conc. • Pyrrolidine Dithio Carbamic Acid - Chloroform Reagent (Pyrrolidine, Chloroform, Carbon disulphide) • Sodium Hydroxide • Chloroform • Bromophenol Blue Indicator (Bromophenol Blue, Ethanol or Isopropanol) • Stock Zinc (II) Solution- 1.0 mg/ml (Zinc Oxide Granules or Zinc Oxide, Nitric Acid)
			iv) Differential Pulse Anodic Stripping Voltammetry (DPASV)Method	<ul style="list-style-type: none"> •Polarographic Instrumentation Capable of Performing Differential Pulse Work • Hanging Mercury Drop Electrode • Platinum Counter Electrode • Saturated Calomel Reference Electrode • Magnetic Stirrer 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc. • Nitric Acid, Conc • Stock Zinc Solution -1.0mg/ml • Amalgamated Zinc (Granular Zinc, Conc. Hydrochloric Acid, Mercury)

			Detection range 0.001 to 0.1mg/l		<ul style="list-style-type: none"> • Purified Nitrogen (Ammonium Meta Vanadate, Scrubber, Amalgamated Zinc, Nitrogen Gas)
			ii) IS 3025(Part 2) : 2019	<ul style="list-style-type: none"> • Oven • Membrane filtration equipment and filters(0.45µm) • Inductively coupled plasma atomic emission spectrometer; Computer controlled AAS with background correction, Radiofrequency Generator, Argon Gas supply(welding grade or better) • pH meter • PTFE container • PTFE sample bottles(250 ml or 500ml) • Acid dispensers, Variables 	<ul style="list-style-type: none"> • Nitric acid • Hydrogen peroxide • Sulphuric acid • Ammonium sulphate • Sodium Stock solution

C- REQUIREMENTS FOR TOXIC SUBSTANCES

SI. No.	Tests	Clause Ref. of IS 10500	Referred Method of Tests & Limit of Detection	Test /Equipment /Apparatus	Chemical/Reagents
(1)	(2)	(3)	(4)	(5)	(6)
i	CADMIUM	4, Sl. No. i) of Table 3	IS 3025 (Part 41) i) Atomic Absorption Method (Direct) Detection range 0.05 to 2mg/l	<ul style="list-style-type: none"> • Atomic Absorption spectrophotometer with Air-Acetylene Flame • Cadmium Hollow Cathode Lamp or Multi Element Hollow Cathode Lamp for Use at 228.8 nm 	<ul style="list-style-type: none"> • Hydrochloric acid, Conc. • Nitric acid, Conc. • Nitric acid, dilute – 1:499 • Pure Cadmium Metal
			ii) Atomic Absorption Method (Chelation and Extraction) Detection range 0.005 to 0.2mg/l	<ul style="list-style-type: none"> • Atomic Absorption spectrophotometer with Air-Acetylene Flame • Cadmium Hollow Cathode Lamp or Multi Element Hollow Cathode Lamp for use at 228.8 nm • Separating funnel • pH meter • pH paper 	<ul style="list-style-type: none"> • Hydrochloric acid, Conc. • Hydrochloric acid – 1:49 • Nitric acid, Conc. • Nitric acid, dilute – 1:499 • Pure Cadmium Metal • Sodium hydroxide • Methyl Isobutyl Ketone (MIBK) • Bromophenol Blue • Ethanol or Isopropanol • Pyrrolidine dithiocarbamic acid • Carbon Disulphide
			iii) Differential Pulse Anodic Stripping Voltametry Detection range 0.0001 to 0.1mg/l	<ul style="list-style-type: none"> • Polarograph – Capable of Differential Pulse Work • Hanging Mercury Drop Electrode • Platinum Counter Electrode • Saturated calomel Reference Electrode • Magnetic Stirrer Control Unit with Stirring Bar • Nitrogen Gas (Cylinder) 	<ul style="list-style-type: none"> • Hydrochloric Acid, Conc., spectrograde • Nitric Acid, Conc., spectrograde • Nitric Acid, dil – 1:1 • Hydroxylamine Hydrochloride • L-Ascorbic Acid • Pure Cadmium Metal

				<ul style="list-style-type: none"> • Scrubber assembly for nitrogen purification • Voltametric Cell assembly 	<ul style="list-style-type: none"> • Granular Zinc • Mercury • Ammonium Meta Vanadate
ii	CYANIDE	4, Sl. No. ii) of Table 3	IS 3025(Part 27) i) Total cyanide after distillation method Detection limit minimum 0.02 mg/l	<ul style="list-style-type: none"> • Distillation apparatus consisting of boiling flask, 1l, thistle tube, gas dispersion tube, needle valve, suction flask and suction pump (Fig 1 of IS 3025 Pt 27) • Heating mantle • Gas absorber • Ground glass ST joints • Spectrophotometer for use at 62 nm with 1-cm cell • pH paper • Thermometer – 0°C – 110°C, 1.c. 1°C 	<ul style="list-style-type: none"> • Sodium hydroxide • Lead carbonate-powdered • Sulphamic acid • Magnesium chloride • Sulphuric acid, conc • Acetic acid, glacial • Potassium cyanide • Silver nitrate • Chloramine – T • Pyridine • Pyrazolone • BIS – pyrazolone
			ii) Selective electrode method Detection range 0.05 to 10 mg/l	<ul style="list-style-type: none"> • Expanded – scale pH meter or specific Ion meter • Cyanide Ion selective electrode • Reference electrode, double junction • Magnetic mixer with TFE coated stirring Bar 	<ul style="list-style-type: none"> • Potassium cyanide • Silver nitrate • Sodium hydroxide • Potassium nitrate • Potassium hydroxide
iii	LEAD	4, Sl. No. iii) of Table 3	IS 3025(Part 47) i) Atomic absorption method (direct) Detection range 1.0 to 10.0mg/l	<ul style="list-style-type: none"> • Atomic absorption spectrophotometer with air acetylene flame • Hollow cathode lamp OR Electrodeless Discharge lamp for use at 283.3 nm 	<ul style="list-style-type: none"> • Hydrochloric acid, conc • Nitric acid, conc. • (Lead nitrate • Nitric acid, dil (1:499)
			ii) Atomic absorption method (chelation – extraction)	<ul style="list-style-type: none"> • Atomic absorption spectrophotometer with air acetylene flame • Hollow cathode lamp OR Electrodeless Discharge lamp for use at 283.3 nm • Separatory funnel 	<ul style="list-style-type: none"> • Hydrochloric acid, conc • Hydrochloric acid, dil (1:2) • Hydrochloric acid, dil (1:49) • Nitric acid, conc. • Pyrrolidine • Chloroform

				<ul style="list-style-type: none"> • 0.45µm membrane filter • Acid washed filter paper. • pH meter 	<ul style="list-style-type: none"> • Carbon disulphide • Sodium hydroxide • Bromophenol blue • Lead nitrate
			<p>iii) Differential pulse anodic stripping voltametry (DPASV)</p> <p>Detection range 0.001 to 0.1mg/l</p>	<p>Polarograph capable of performing differential pulse work</p> <ul style="list-style-type: none"> • Hanging mercury drop electrode • Platinum counter electrode • Saturated calomel reference electrode • Magnetic stirrer control unit with stirring bar • Scrubber assembly for nitrogen purification • Nitrogen gas (cylinder) • 0.45µm membrane filter 	<ul style="list-style-type: none"> • Lead nitrate • Hydrochloric acid, conc. • Nitric acid, conc. • Nitric acid, dil (1:1) • Granular zinc • Mercury • Ammonium metavanadate
			<p>iv) Dithizone method</p> <p>Detection limit 0.1 mg/l</p>	<ul style="list-style-type: none"> • Spectrophotometer for use at 510 nm with 1-cm cell • pH meter • TEF beakers, 100 ml • Separating funnels, 250 ml, 500 ml 	<ul style="list-style-type: none"> • Lead free distilled water • Lead nitrate • Nitric acid, 95% (w/w) • Nitric acid, dil 20% (w/w) • Nitric acid, dil (1:1) • Ammonium hydroxide Conc. (14 N) • Ammonium hydroxide, dil. 10% (v/v) • Ammonium hydroxide, dil. 1% v/v) • Anhydrous Ammonium Citrate • Anhydrous Sodium Sulphite • Hydroxylamine hydrochloride • Potassium cyanide • Dithizone • Chloroform • Hydrochloric acid (1:1)

iv	MERCURY	4, Sl. No. iv) of Table 3	IS 3025 (Part 48) i) Cold Vapour Atomic Absorption Spectrophotometry Detection limit 0.0002 mg/l, Min	<ul style="list-style-type: none"> • Atomic Absorption Spectrometer and Associated Equipment (Cold Vapour Technique) • Mercury Vapour Generation Assembly • Mercury Hollow Cathode Lamp • Recorder/Printer/Display Meter • BOD bottle, 300 ml • Water bath • Equipment assembly as per Fig 1 	<ul style="list-style-type: none"> • Sulphuric acid, conc. • Nitric acid, Conc. • Stannous chloride • Hydrochloric acid, Conc. • Sodium chloride • Hydroxylamine sulphate • Potassium permanganate • Potassium persulphate • Mercuric chloride • Mercury free distilled water
			ii) Colorimetric Dithizone Method Detection limit 0.002 mg/l, Min	<ul style="list-style-type: none"> • Spectrophotometer • Separating Funnels (250 and 1000ml with PTFE stopcocks) • Glass wares • Whatman Filter No. 42 	<ul style="list-style-type: none"> • Redistilled or Deionised Distilled Water (Mercury free) • Mercuric chloride • Nitric acid, Conc. • Potassium permanganate • Potassium persulphate • Hydroxylamine hydrochloride • Dithiozone solution, 6 µg/ml • Sulphuric acid – 0.25 N • Potassium bromide • Chloroform • Disodium hydrogen phosphate • Anhydrous potassium carbonate • Sodium sulphate, Anhydrous • Hydrochloric acid(1:1) • Ammonium hydroxide
v.	Molybdenum	4, sl.No. v) of Table 3	IS 3025(Part 2)	<ul style="list-style-type: none"> • Induction Coupled Plasma-Atomic Emission Spectrometer • Sample Bottles • Glasswares 	<ul style="list-style-type: none"> • Nitric Acid • Hydrogen Peroxide • Sulphuric Acid • Hydrochloric acid • Ammonium Sulfate

				<ul style="list-style-type: none"> • Acid Dispensers • Membrane Filtration Equipment and Filters (0.45µ) • Hot Plate • Argon Gas 	<ul style="list-style-type: none"> • Stock Solution of Molybdenum
vi	NICKEL	4, Sl. No. vi) of Table 3	IS 3025 (Part 54)	•	•
x	Total ARSENIC	4, Sl. No. x) of Table 3	IS 3025(Part 37 i) Atomic absorption method Detection limit 0.001 mg/l	<ul style="list-style-type: none"> • Atomic absorption spectrometer equipped with gas flow meter for Argon or Nitrogen and Hydrogen and with arsenic electrodeless discharge lamp • Atomizer • Reaction cell for producing arsenic hydride • Eye dropper or syringe • Refrigerator 	<ul style="list-style-type: none"> • Argon or Nitrogen and Hydrogen • Sodium borohydride • Sodium hydroxide • Sodium Iodide • Sulphuric acid-18N & 2.5 N • Potassium persulphate • Nitric acid, conc • Perchloric acid, conc • Hydrochloric acid, conc • Arsenic trioxide • Arsenic pentaoxide • Dimethyl arsenic acid/cacodylic acid • Calcium chloride
			ii) Silver diethyl dithiocarbamate method (Referee method) Detection limit 0.001 mg/l	Arsine generator & absorption assembly (Fig. 2 of IS 3025 Pt 37) Spectrophotometer, 535 nm with 1 cm cells	<ul style="list-style-type: none"> • Hydrochloric acid , Conc • Potassium Iodide • Stannous chloride, arsenic free • Lead acetate • Ephedrine • Pyridine • Chloroform • Silver diethyl dithiocarbamate • Zinc – 20 to 30 mesh, arsenic free

					<ul style="list-style-type: none"> • Arsenic trioxide • Sodium hydroxide
			iii) Mercuric bromide stain method	Arsine generator glass assembly (Fig 3 of IS 3025 Pt 37)	<ul style="list-style-type: none"> • Sulphuric acid (1:1) • Nitric acid, conc • Roll cotton • Lead acetate • Arsenic papers • Mercuric bromide • Ethyl alcohol/isopropanol • Potassium iodide • Arsenic free stannous chloride • Zinc-20 to 30 Mesh, arsenic free • Arsenic trioxide • Sodium hydroxide
xi.	Total chromium	4, Sl. No. xi) of Table 3	IS 3025 (Part 52) i) Diphenylcarbazide Method ii) Atomic Absorption Method (Direct)	<p>Spectrophotometer, for use at 540 nm, with a light path of 1 cm.</p> <ul style="list-style-type: none"> • <i>Standard Volumetric Glasswares</i> • <i>pH meter</i> <p>Atomic absorption spectrophotometer with air acetylene flame. Hollow-cathode lamp or electrodeless discharge lamp for use at 357.9 nm.</p>	<ul style="list-style-type: none"> • <i>Stock Chromium Solution</i> • <i>Standard Chromium Solution</i> • <i>Nitric Acid</i> — concentrated (16 N). • <i>Sulphuric Acid</i>— concentrated • <i>Phosphoric Acid</i> — concentrated (41 N). • <i>Methyl Orange Indicator Solution</i> • <i>Ammonium Hydroxide</i> — concentrated (14 N). • <i>Potassium Permanganate Solution</i> • <i>Sodium Azide Solution</i>r. • <i>Diphenylcarbazide Solution</i> • <i>Acetone</i> • <i>Hydrochloric Acid</i> — concentrated • <i>Nitric Acid</i> — concentrated • <i>Sulphuric Acid</i> — concentrated • <i>Hydrogen Peroxide</i> • <i>Stock Chromium Solution</i>

*Note: Besides listed Equipments/Apparatus/Chemicals, following accessories are essential part of a chemical lab:

- i) General glass wares like Pipettes Burette, Conical flasks, Beakers, Measuring cylinders, Volumetric flasks, (of different volumes)

 - ii) Provision for distilled/double distilled water
 - iii) Fuming Hood and sink with tap in the lab
- # The list does not cover the requirements of Polychlorinated biphenyls, Polynuclear aromatic hydrocarbons ,Pesticide Residues and Radio Active Residues as these requirements are to be got tested from outside approved lab.

D - MICROBIOLOGICAL REQUIREMENTS

General microbiological lab equipments **

- Hot air oven (capable of 160 to 180 °C).
- Autoclave (capable of 15 psi/ 121 °C) of suitable size as per need.
- Weighing Balance with least count 0.01 g (least count 0.001 g, if Tergitol-7 agar medium or Crystal violet neutral red bile lactose (VRBL) agar is being prepared in house).
- pH meter with least count 0.1 pH unit.
- Laminar air flow chamber OR Class II Biosafety Cabinets shall be used for product testing and reference culture in microbiology laboratories.
- Hot plate for media preparation.
- Membrane filtration assembly (including sterilized membrane filters of 47 mm to 50 mm diameter with 0.45 µm pore size, vacuum pump (for applying vacuum of about 70 kPa) and forceps with rounded tips).

- Inoculation loop/needle.

- Bunsen burner with LPG cylinder.

- Thermostatically controlled water bath.
- Air conditioner (recommended)
- Refrigerator

- General glasswares including, petri dishes (made of glass or plastic), volumetric pipettes (of capacity 1 ml and 10 ml), flasks, test tubes, culture bottles, funnels, glass rod, measuring cylinders.

- Thermometer with least count, at least four times smaller than the range of required maximum permissible tolerance shall be used)
- Filter paper
- Cotton

SI. No.	Parameter	Clause Ref. Of IS 10500	Referred Method of Test	Test Equipment/Apparatus **	Chemicals/Media/Reagents **
(1)	(2)	(3)	(4)	(5)	(6)
1	<i>Escherichiacoli</i> (or thermotolerant bacteria)	4.1.1 & Table 6	IS 15185/ISO 9308-1	<ul style="list-style-type: none"> • General microbiological lab equipments (as listed above) • Incubator capable of maintaining (36±2)⁰C • Equipment, for membrane filtration • Membrane filters • Disinfected forceps, for handling of membrane filters. • @Incubator capable of maintaining 44°C • Microscope and Glass slides (<i>for Gramstaining</i>) 	<ul style="list-style-type: none"> • Distilled water • Chromogenic Coliform Agar (Enzymatic digest of casein 1.0g, Yeast Extract 2.0g, Sodium chloride 5.0g, • Sodium dihydrogen phosphate x 2H₂O 2.2g, • Disodium Hydrogen Phosphate 2.7g, • Sodium pyruvate 1.0g, • Sorbitol 1.0g, • Tryptophane 1.0g, Tergitol – 7 0.15g, 6-chloro 3 indoxyl Beta D Galactopyranoside 0.2g, 5-Bromo 4-Chloro 3Indoxyl Beta D Glucuronic Acid 0.1g, • Iso propyl Beta D thiogalactopyranoside (IPTG) 0.1g, • Bacteriological Agar 9-18g • Water 1000ml • pH 6.8±0.2 at 25°C. • Oxidase reagent: • N,N,N',N'- Tetramethyl p phenylenediamine dihydrochloride 0.1g,

					<ul style="list-style-type: none"> • Water 10ml • Tryptone Soya Agar: • Tryptone 15.0g, • Soya Peptone 5.0g, • Sodium Chloride 5.0g, • Agar 15-25g, • Water 1000ml • pH 7.2±0.2 at 25°C • @Medium for indole production • @Kovac's reagent (<i>for indole test</i>) • Gram stain – (Methyl violet or Crystal violet, Iodine, Potassium iodide; Neutral red, Acetic acid, Ethanol)
2.	Coliform Bacteria	4.1.1 & Table 6	ii) IS 15185 :2016/ISO 9308-1:2014	<ul style="list-style-type: none"> • General microbiological lab equipments (as listed above) • Sample quantity : 50 ml • Incubator, thermostatically controlled at (36 ± 2) °C. • Equipment, for membrane filtration • Membrane filters • Disinfected forceps, for handling of membrane filters. • @Incubator capable of maintaining 44°C • Microscope and Glass slides (<i>for Gramstaining</i>) 	<ul style="list-style-type: none"> • Distilled water • Chromogenic Coliform Agar (Enzymatic digest of casein 1.0g, Yeast Extract 2.0g, Sodium chloride 5.0g, • Sodium dihydrogen phosphate x 2H₂O 2.2g, • Disodium Hydrogen Phosphate 2.7g, • Sodium pyruvate 1.0g, • Sorbitol 1.0g, • Tryptophane 1.0g, Tergitol – 7 0.15g, 6-chloro 3 indoxyl Beta D Galactopyranoside 0.2g, 5-

					<p>Bromo 4-Chloro 3Indoxyl Beta D Glucuronic Acid 0.1g,</p> <ul style="list-style-type: none"> • Iso propyl Beta D thiogalactopyranoside (IPTG) 0.1g, • Bacteriological Agar 9-18g • Water 1000ml • pH 6.8±0.2 at 25°C. <p>• Oxidase reagent:</p> <ul style="list-style-type: none"> • N,N,N',N'- Tetramethyl p phenylenediamine dihydrochloride 0.1g, • Water 10ml <p>• Tryptone Soya Agar:</p> <ul style="list-style-type: none"> • Tryptone 15.0g, • Soya Peptone 5.0g, • Sodium Chloride 5.0g, • Agar 15-25g, • Water 1000ml • pH 7.2±0.2 at 25°C • @Medium for indole production • @Kovac's reagent (<i>for indole test</i>) • Gram stain – (Methyl violet or Crystal violet, Iodine, Potassium iodide; Neutral red, Acetic acid, Ethanol)
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Note 1 – General Microbiological Lab Equipments as listed are common for various microbiological tests. Other additional equipments required for specific test methods are indicated against each parameter.

Note 2 – For preparation of culture media and reagents ingredients of uniform quality and chemicals of analytical reagent grade should be used. Alternatively, commercially available media and reagents may be used provided their composition comply with those given in Indian Standards.

Note 3 – Disposable glassware may be accepted as an alternative to re-usable glassware.

Note 4 – All efforts have been made to compile the list as per the respective standards exhaustively covering all the required test equipments, apparatus and chemicals. However, in case any omission or incorrectness is noticed while referring, the same may be conveyed to CMD immediately for suitable actions.

@The marked equipments/ chemicals and media are required for confirmatory tests of respective microorganisms. The confirmatory test may be dispensed with/omitted, provided the licensee undertakes to start corrective actions based on presumptive presence of microorganisms.

ANNEX B

**INSPECTION AND TESTING PLAN FOR
CERTIFICATION OF DRINKING WATER AS PER IS 10500:2012 UNDER
SCHEME IV OF BIS (CONFORMITY ASSESSMENT), REGULATIONS 2018**

1.0 LABORATORY -A laboratory shall be maintained which shall be suitably equipped and staffed with competent testing person(s) to carry out the different tests in accordance with the methods given in the Indian standards. Testing person(s) shall be science/engineering graduate from disciplines such as chemistry/chemical engineering/ microbiology/ biotechnology/ biochemistry/ food technology/ botany and other biological/ life sciences. Engineering graduates from disciplines such as chemical engineering may also be engaged as testing persons.

2.0 TEST RECORDS - All records of analysis and tests shall be kept in suitable forms approved by the Bureau of Indian Standards (BIS) for a minimum period of 3 years. Copies of any records that may be required by BIS shall be made available at any time on request.

3.0 TEST CERTIFICATE - For each day's supply of drinking water conforming to this specification there shall be a test certificate which shall contain the batch number/date of supply and the corresponding test results. The means adopted for water treatment shall also be declared on the test certificate. Each day's test certificate shall be hosted prominently on the website of the water supply body along with the details of the areas/location to which the water was supplied.

3.1 Since for many parameters, tests may not be completed in a day, the test certificate may be updated as and when test results are available. For the parameters for which test results are not available at a point in time, "test result awaited" may be mentioned.

4.0 LEVELS OF CONTROL -The tests as indicated in Table 1 and at the levels of control specified therein, shall be carried out on the whole supply of the unit covered by this Scheme and appropriate records maintained in accordance with clause 2 of this Scheme.

5.0 CONTROL UNIT - For the purpose of this Scheme, the quantity of drinking water treated/processed from each processing line and supplied in one day shall constitute a Control Unit.

5.1 On the basis of tests and analysis results, the decision regarding conformity or otherwise of a Control Unit to the given requirements shall be made.

5.2 In respect of all other clauses of the Standard (other than those mentioned under Levels of Control– Table 1 of this Scheme) the water supply body shall maintain appropriate controls and checks to ensure that the water supplied conforms to the requirements of the standard.

6.0 SOURCE WATER - The source water used in production of Drinking Water shall be initially tested for Organoleptic and physical parameters (Table 1), Chemical requirements (Table 2), and all microbiological requirements possible to be tested in house. Subsequently, its quality may be regularly assessed at least once in three months through in-house testing for Colour, Odour, Taste, Turbidity, pH, Total Dissolved Solids and Microbiological requirements. In addition, any other requirements as considered necessary for process control, are to be tested where the incidence of their presence in higher levels has been detected during the previous tests.

6.1 Whenever, the quality of treated water is found to be not in conformity with the requirements of IS 10500 for the tested parameters, the source water shall be checked again for such parameters to decide the necessary controls to be exercised for ensuring the conformity of processed water to IS 10500.

6.2 In case non-conformity is observed for radioactive substances, the source of water shall be abandoned and water shall be recalled immediately.

6.3 As and when there is change in source water or addition of new source of raw water, it shall be intimated to BIS. The raw water collected from the new source shall be tested in accordance with Clause 6 as above and the treated water produced from such source water shall be tested for conformity to IS 10500 before commissioning for regular production and marking, and records of the same be maintained.

6.4 In case the applicant is adopting more than one type of processes/sources of raw water, separate samples shall be drawn for each process/source.

7.0 HYGIENIC CONDITION - The source water shall be collected, processed, handled, and stored in accordance with the hygienic practices given under Annex B of IS 14543 : 2016. Other clauses shall also be complied with in day to day production and quality control activities. Schedule for each activity for this purpose shall be displayed prominently in the premises and records of compliance shall be maintained for scrutiny by the Bureau. The hygienic conditions shall also be maintained at the site of water source.

8.0 ROUTINE SURVEILLANCE - Routine surveillance of drinking water supplies should be carried out by the relevant authorities to understand the risk of specific pathogens and define proper control procedures. The WHO Guidelines for Drinking Water Quality, may be referred to for specific recommendations on using a water safety approach incorporating risk identification. Precautions/Care should be taken to prevent contamination of drinking water from chlorine resistant parasites such as cryptosporidium species and giardia.

9.0 REJECTION - Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016. A separate record providing the detailed information regarding the rejected control units and mode of their disposal shall be maintained. Such material shall in no case be stored together with that conforming to the specification.

DRINKING WATER

(IS 10500 : 2012)

TABLE 1 LEVELS OF CONTROL

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or)S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method Cl. Ref.	Test Method IS		No. of Sample	Frequency	Remarks
Table 1 Organoleptic and Physical Parameters							
i)	Colour		IS 3025 Part 4	R	One	Each Control Unit	
ii)	Odour		IS 3025 Part 5	R	One	Each Control Unit	
iii)	pH value		IS 3025 Part 11	R	One	Every four hours	
iv)	Taste		IS 3025 Part 7 and 8	R	One	Each Control Unit	
v)	Turbidity,		IS 3025 Part 10	R	One	Each Control Unit	
vi)	Total dissolved solids		IS 3025 Part 16	R	One	Each Control Unit	
Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts							
i)	Aluminium		IS 3025 (Part 55)	R	One	Once in a week	
ii)	Ammonia (as total ammonia-N)		IS 3025 (Part 34)	R	One	Once in a week	
iii)	Anionic detergents (as MBAS)	Annex K	IS 13428	S	One	Once in a month	
iv)	Barium	Annex F	IS 13428	S	One	Once in a month	
v)	Boron		IS 3025 (Part 57)	S	One	Once in a month	
vi)	Calcium		IS 3025 (Part 40)	R	One	Once in a week	
vii)	Chloramines		IS 3025 (Part 26)	R	One	Once in a week	
viii)	Chloride		IS 3025 (Part 32)	R	One	Each control unit	
ix)	Copper		IS 3025 (Part 42)	S	One	Once in a month	
x)	Fluoride		IS 3025 (Part 60)	S	One	Once in six months	
xi)	Free residual chlorine		IS 3025 (Part 26)	R	One	Each control unit	To be applicable only when water is chlorinated .Tested at consumer end.
xii)	Iron		IS 3025 (Part 53)	S	One	Once in a month	
xiii)	Magnesium		IS 3025 (Part 46)	R	One	Once in a week	
xiv)	Manganese		IS 3025 (Part 59)	S	One	Once in a month	

xv)	Mineral oil	Clause 6	IS 3025 — (Part 39) Infrared Partition method	S	One	Once in a month	
xvi)	Nitrate (as NO ₃),		IS 3025 (Part 34)	R	One	Once in a week	
xvii)	Phenolic compounds (as C ₆ H ₅ OH),		IS 3025 (Part 43)	S	One	Once in a month	
xviii)	Selenium (as Se),		IS 3025 (Part 56) or IS 15303	S	One	Once in six months	
xix)	Silver	Annex J	IS 13428	S	One	Once in six months	
xx)	Sulphate		IS 3025 (Part 24)	R	One	Each control unit	
xxi)	Sulphide		IS 3025 (Part 29)	R	One	Once in a week	
xxii)	Total alkalinity as calcium carbonate		IS 3025 (Part 23)	R	One	Each control unit	
xxiii)	Total hardness (as CaCO ₃)		IS 3025 (Part 21)	R	One	Once in a week	
xxiv)	Zinc		IS 3025 (Part 49)	S	One	Once in a month	
Table 3 Parameters Concerning Toxic Substances							
i)	Cadmium		IS 3025 (Part 41)	S	one	Once in six months	
ii)	Cyanide		IS 3025 (Part 27)	S	one	Once in six months	
iii)	Lead		IS 3025 (Part 47)	S	one	Once in six months	
iv)	Mercury		IS 3025 (Part 48)/ Mercury analyser	S	one	Once in six months	
v)	Molybdenum		IS 3025 (Part 2)	S	one	Once in six months	
vi)	Nickel		IS 3025 (Part 54)	S	one	Once in six months	
vii)	Polychlorinated biphenyls		ASTM 5175	S	one	Once in six months	
viii)	Polynuclear aromatic hydrocarbons (as PAH)		APHA 6440	S	one	Once in six months	
ix)	Total arsenic		IS 3025 (Part 37)	S	one	Once in six months	
x)	Total chromium		IS 3025 (Part 52)	S	one	Once in six months	
xi)	Trihalomethanes						
a)	Bromoform		ASTM D 3973-85 or APHA 6232	S	one	Once in six months	
b)	Dibromochlorometh ane		ASTM D 3973- 85or APHA 6232	S	one	Once in six months	
c)	Bromodichlorometh ane		ASTM D 3973- 85or APHA 6232	S	one	Once in six months	
d)	Chloroform		ASTM D 3973- 85or APHA 6232	S	one	Once in six months	

Table 4 Parameters Concerning Radioactive Substances							
i)	Alpha emitters		IS 14194 Part 2	S	one	Once in five years	
ii)	Beta emitters		IS 14194 Part 1	S	one	Once in five years	
Table 5 Pesticide Residues							
i)	Alachlor		USEPA 525.2, 507	S	one	Once in six months	
ii)	Atrazine		USEPA 525.2, 8141 A	S	one	Once in six months	
iii)	Aldrin/ Dieldrin		USEPA 508	S	one	Once in six months	
iv)	Alpha HCH		USEPA 508	S	one	Once in six months	
v)	Beta HCH		USEPA 508	S	one	Once in six months	
vi)	Butachlor		USEPA 525.2, 8141 A	S	one	Once in six months	
vii)	Chlorpyrifos		USEPA 525.2, 8141 A	S	one	Once in six months	
viii)	Delta HCH		USEPA 508	S	one	Once in six months	
ix)	2,4-Dichlorophenoxyacetic acid		USEPA 515.1	S	one	Once in six months	
x)	DDT (<i>o, p</i> and <i>p, p</i> – isomers of DDT, DDE and DDD)		USEPA 508 OR AOAC 990.06	S	one	Once in six months	
xi)	Endosulfan (alpha, beta, and sulphate)		USEPA 508 OR AOAC 990.06	S	one	Once in six months	
xii)	Ethion		USEPA 1657 A	S	one	Once in six months	
xiii)	Gamma — HCH (Lindane)		USEPA 508 OR AOAC 990.06	S	one	Once in six months	
xiv)	Isoproturon		USEPA 532	S	one	Once in six months	
xv)	Malathion		USEPA 8141 A	S	one	Once in six months	
xvi)	Methyl parathion		USEPA 8141 A OR ISO 10695	S	one	Once in six months	
xvii)	Monocrotophos		USEPA 8141 A	S	one	Once in six months	
xviii)	Phorate		USEPA 8141 A	S	one	Once in six months	
Table 6 Bacteriological Quality of Drinking Water							
i)	<i>E. coli</i> or thermotolerant coliform bacteria		IS 15185	R	One	Each control unit	
ii)	Total coliform bacteria		IS 15185	R	One	Each control unit	

4.2	Virological Requirements						
i)	MS2 phage		USEPA method 1602	S	One	Once in a year	
ii)	Polymerase Chain Reaction (PCR) method	Annex B	IS 10500 or USEPA method in Manual of Method for Virology Chapter 16, June 2001	NA	NA	NA	To be conducted only if MS2 phage are detected in the drinking water
4.3	Biological Requirements						
i)	General biological examination	4.3.1 to 4.3.7	IS 10500	S	one	Once in a month	Draft amendment to IS 10500 is being considered wherein these parameters have been specified for guidance purpose only.
ii)	Cryptosporidium		USEPA method 1622 or USEPA method 1623* or ISO 15553 : 2006	S	one	Once in six months	
iii)	Giardia		USEPA method 1623* or ISO 15553 : 2006	S	one	Once in six months	
iv)	Freedom from microscopic organisms	4.3.10	IS 10500	S	one	Once in a month	Draft amendment to IS 10500 is being considered wherein these parameters have been specified for guidance purpose only.

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.