The WATER FILTRATION Guys – Water Testing Guidelines

This is a comprehensive overview of **water quality testing**—what parameters are commonly measured, how they're tested, and what the results typically indicate:

1. Physical Tests

- **Temperature**: Affects dissolved gases and aquatic life. Ideal for drinking water: ~7–12 °C.
- **Turbidity**: Indicates cloudiness due to suspended solids; measured in NTU (Nephelometric Turbidity Unit – see below). Safe drinking water is usually <1 NTU.
- **Colour, Odor, Taste**: Subjective indicators; unpleasant values may signal organic matter or contamination.
- **Total Dissolved & Suspended Solids (TDS/TSS)**: TDS under 500 ppm (mg/L) is considered acceptable.

2. Chemical/Analytical Tests

- **pH**: Measures acidity/alkalinity (0–14); safe range is generally 6.5–8.5.
- **Conductivity**: Indicates ionic content; correlates with TDS.
- **Hardness**: Levels of Ca^{2+}/Mg^{2+}, manageable up to ~120 mg/L; impacts scaling and soap efficiency.
- **Alkalinity**: Buffering capacity, protects pH stability; typical desirable range is 20–200 mg/L as $CaCO_3$.
- **Dissolved Oxygen (DO)**, **BOD**, **COD***:
  - DO: ≥5 mg/L supports aquatic life.
  - BOD (<5 mg/L) and COD (<50 mg/L) show organic pollution levels .
- **Nutrients** (Nitrates, Nitrites, Phosphates):
  - Nitrates <50 mg/L and nitrites <3 mg/L are safe; higher values signal contamination.
  - Phosphates <0.1 mg/L to prevent eutrophication.
- **Heavy Metals** (Lead, Arsenic, Mercury, etc.): Even trace amounts are harmful—e.g., lead <0.01 mg/L.

* BOD – Biochemical Oxygen Demand, COD – Chemical Oxygen Demand (see below)

3. Biological Tests

- **Coliform/E. Coli**: Indicators of faecal contamination; drinking water must be 0 CFU/100 mL.
- **Heterotrophic Plate Count**, specific pathogen tests (Salmonella, etc.) are used if coliforms are detected .

4. Specialised Tests

- **Cyanotoxins**: Neurotoxins from algal blooms; require specific assays.
- **Radiological (e.g., Radon, Uranium)**: Important in groundwater areas.

5. Testing Methods & Tools

- **Field instruments**: pH meters, turbidity meters, DO probes, conductivity/TDS meters
- **Lab methods**:
    - Bacteriological via membrane filtration/culture
    - BOD via 5-day dilution (EPA method 5210B)
    - Metals via AAS/ICP-MS, nutrients via spectrophotometry/ion chromatography

6. What Results Typically Show

- **Home water report (well water example)**:

    Chloride 142 mg/L (OK), Hardness 253 mg/L (moderately hard), Nitrate 2.24 mg/L (safe), Sulphate 23 mg/L (safe), TDS elevated.

    - Action: Consider softening or RO for hard/ high-TDS water.
- **Municipal compliance**: Regular tests ensure pH, turbidity, chlorine residual, coliforms, and metals meet standards.

💬 **Contact us today for a free water consultation and quote.**

📞 Clean water starts with a conversation.

The WATER FILTRATION Guys

www.theXguys.co.za

SCAN ME

Summary Table

Parameter	Test Type	Safe Drinking Range	Significance
pH	pH meter	6.5–8.5	Affects taste, corrosion, disinfection
Turbidity	NTU meter	<1 NTU	Clarity; indicates particulate contamination
TDS	TDS probe	<500 ppm	Indicates dissolved solids
Hardness	Colorimeter	60–120 mg/L	Impacts scale buildup & soap efficiency
DO	DO probe	≥5 mg/L	Crucial for aquatic ecosystems
BOD/COD	Lab analysis	BOD <5 mg/L; COD <50 mg/L	Organic pollution indicators
Coliform/E. coli	Culture test	0 CFU/100 mL	Safety against faecal contamination
Nitrates	Spectrophot	<50 mg/L	Toxic at high levels, esp. for infants
Heavy Metals	AAS/ICP-MS	Lead <0.01 mg/L, etc.	Harmful contaminants at trace levels

Home vs. Lab Testing

- **Home kits/strips**: Quick, inexpensive for screening; less precise.
- **Digital meters**: Effective for TDS, pH, hardness.
- **Lab tests**: Recommended annually or where contamination is suspected—for pathogen, metal, and nutrient analysis.

Tips

- Well users should test annually; test after heavy rains, disasters, or system work .
- Track trends: rising TDS or turbidity can signal system deterioration.
- Use specialized tests (e.g. cyanotoxins, radionuclides) based on local risks.

SCAN ME

NTU stands for Nephelometric Turbidity Unit

It is a measurement of **turbidity**, which refers to how cloudy or hazy the water is due to suspended particles like silt, algae, microbes, or organic matter.

How It Works:

- A **nephelometer** (or turbidimeter) shines a light through the water and measures the amount of light **scattered at a 90-degree angle**.
- The more scattering, the higher the NTU—indicating more suspended particles.

What NTU Levels Mean:

NTU Level	Visual Quality	Typical Interpretation
0–1 NTU	Crystal clear	Ideal for drinking water (per WHO standards)
1–5 NTU	Slightly hazy	Still acceptable for most purposes
5–50 NTU	Noticeably cloudy	May indicate sediment or microbial presence
>50 NTU	Very murky	Not safe for drinking without filtration

Key Notes:

- NTU does **not** identify **what** is in the water—just **how much light is scattered**.
- It's often used as a **quick indicator** of water cleanliness and filtration effectiveness.

SCAN ME

BOD and **COD**: Key Indicators of Organic Pollution:

BOD – Biochemical Oxygen Demand

- **Definition**: The amount of **dissolved oxygen** needed by **aerobic bacteria** to break down organic matter in water over a specific time period (usually **5 days at 20°C**).
- **Units**: mg/L (milligrams per litre)
- **Significance**:
    - High BOD = more organic pollution → lower oxygen for aquatic life.
    - Common in wastewater, sewage, or runoff from agriculture.

COD – Chemical Oxygen Demand

- **Definition**: The total amount of oxygen required to chemically **oxidise** all organic and inorganic matter in water, using a **strong chemical oxidant** (e.g. potassium dichromate).
- **Units**: mg/L
- **Significance**:
    - COD is usually **higher than BOD**, as it includes substances not biodegradable.
    - Faster to test than BOD, and useful for monitoring pollution trends.

Typical Ranges

Water Type	BOD (mg/L)	COD (mg/L)
Drinking Water	<1	<10
Treated Wastewater	<20	<60
Untreated Sewage	200–600	400–1000+

Why They're Important in Water Filtration

- They indicate **how much organic load** is in the water.
- High BOD/COD means water needs **more treatment**, possibly including:
    - Aeration
    - Biological filtration (e.g. biofilters)
    - Activated carbon
    - Chemical oxidizers (for COD)

💬 **Contact us today for a free water consultation and quote.**

📞 Clean water starts with a conversation.

The WATER FILTRATION Guys

www.theXguys.co.za

SCAN ME