**Total Organic Carbon (TOC), Total Nitrogen (TN) and Non-Purgeable Organic Carbon (NPOC)**

1. **Principle of Method:** This method measures the quantity of total organic carbon (TOC) as non-purgeable organic carbon (NPOC) and/or total nitrogen (TN) in water and soil extracts. NPOC is measured by acidifying an aliquot of water or soil extract and then sparging the sample to strip off any purgeable organic and inorganic carbon. The sample is then injected into a combustion tube that contains a catalyst material. A redox reaction occurs that evolves carbon dioxide gas (CO2) which is then detected by a non-dispersive infrared (NDIR) detector for carbon. For nitrogen analysis, the sample is combusted to NO and NO2, then reacted with ozone to form NO2 in an excited state. The resultant photon emission is measured by a Chemiluminescence detector. Quantitation is achieved by calibrating the TOC-V instrument with known standard materials. Shimadzu TOC-V Total Organic Carbon Analyzer
2. **Instrumentation Used:**

Shimadzu TOC-V CHS/CSN Model Total Organic Carbon Analyzer, manufactured by the Shimadzu Corporation, Analytical &Measuring Instrument Division, 1, Nishinokyo-Kuwabara-cho, Nakagyo-ku, Kyoto 604-8511, Japan.

**3. References**:

**3.1** Total Organic Carbon Analyzer TOC-V User Manual, Shimadzu Corporation, Analytical & Measuring Instruments Division, Kyoto, Japan, 2001.

**3.2** Non-Purgeable Organic Carbon (NPOC): Shimadzu TOC-5050A Total Organic Carbon Analyzer,Dr. Mark W. Williams, Institute of Arctic and Alpine Research, University of Colorado, 2000.

**4. Standards Used:**

**4.1 QC Check Standard:** Total Carbon KHP QC Standard (Certified Reference Standard).

**4.2 TN Calibration Standard:** Potassium Nitrate, ACS grade.

**4.3 TOC Calibration Standard:** Potassium Hydrogen Phthalate, ACS grade.