

METHOD STATEMENT

Determinand:

Manual determination of Electrical Conductivity.

Matrix:

Sample Types: Raw and Potable waters.

Principle of Method:

This method uses a Conductivity Jenway model 4510 meter and a suitable Electrode.

Electrical Conductivity is a measure of a solution's ability to conduct electricity. An AC bridge measures the resistance of the solution between two electrodes. The resistance is converted to Specific conductance by the use of a constant for the electrodes.

Electrical conductivity is dependent on temperature. For drinking water samples Electrical Conductivity will normally decrease with a decrease in temperature and increase with an increase in temperature as the higher the temperature, the less viscous the water. This allows ions to move around more freely at higher temperatures and thus less freely at lower temperatures. Although the meter used in this method features a temperature compensation facility it is important that samples are analysed at room temperature. Room temperature is normally considered to be 20°C.

Interferences:

If oil or grease is present in the sample the electrode may become coated, this could cause measurement errors.

Temperature significantly effects Conductivity measurement. Although the instrument compensates for temperature by automatic adjustment, all samples and standards should be analysed at room temperature.

Performance of the Method:

Range of Application:

LOD to 1276 µS/cm, this range may be extended by the use of appropriate check standards e.g. up to 4522 µS/cm if this check standard shows satisfactory performance.

Asset No. 0206 The reporting limit is 2.2 µS/cm.

Asset No. 1121 The reporting limit is 2.0 µS/cm.

Limit of Detection:

Asset No. 0206 2.15 µS/cm.

Asset No. 1121 1.91 µS/cm.

Recoveries of Compounds and Uncertainty of measurement:

Reporting limits and a summary of the performance testing details are documented in the tables below.

CONDUCTIVITY METER 1 (Asset 0206)

<u>Sample type</u>	<u>Mean sample result (µS/cm)</u>	<u>Mean sample spike result (µS/cm)</u>	<u>Conc. of spike (µS/cm)</u>	<u>Spike recovery (%)</u>	<u>% uncertainty</u>
Soft-Bridgend	129	261	133	99.15	±2.74
Medium-Coventry	332	966	654	96.93	± 4.34
Hard-Elvington	576	1201	654	95.51	±5.44
Cowick BH No1	544	1170	654	95.78	±6.11
Elvington WTW Raw.	429	1064	654	97.02	± 5.33



METHOD STATEMENT



CONDUCTIVITY METER 2 - Reporting Limit is 2.0 $\mu\text{S}/\text{cm}$.

<u>Sample type</u>	<u>Mean sample result ($\mu\text{S}/\text{cm}$)</u>	<u>Mean sample spike result ($\mu\text{S}/\text{cm}$)</u>	<u>Conc. of spike ($\mu\text{S}/\text{cm}$)</u>	<u>Spike recovery (%)</u>	<u>% uncertainty</u>
Soft-Bridgend	129	260	133	98.09	± 3.64
Medium-Coventry	329	965	654	97.24	± 4.48
Hard-Elvington	573	1196	654	95.20	± 6.62
Cowick BH No1	542	1167	654	95.47	± 5.97
Elvington WTW Raw.	428	1057	654	96.21	± 5.52

References:

The Measurement of Electrical Conductivity and the Laboratory Determination of the pH Value of Natural, Treated and Waste Waters 1978. Methods for the Examination of Waters and Associated materials. (HMSO). ISBN 0117514284

