

The Canadian Air and Precipitation Monitoring Network

Réseau canadien d'échantillonnage des précipitations et de l'air

Performance of the Canadian Air and Precipitation Monitoring Network (CAPMoN) Laboratory in the International Laboratory Intercomparison Study of the World Meteorological Organization

Shown is an ongoing assessment of the performance of the Canadian Air and Precipitation Monitoring Network's Laboratory (Environment and Climate Change Canada, Toronto, Canada) in the international Laboratory Intercomparison Study (LIS) of the World Meteorological Organization's Global Atmosphere Watch (WMO/GAW) Programme. The CAPMoN Laboratory is one of 60 – 90 international laboratories that participate in the studies, the results of which are reported on the World Meteorological Organization web site for the Quality Assurance Science Activity Centre-Americas (<http://www.qasac-americas.org/lis/summary/55>). The CAPMoN Laboratory participates in two WMO studies each year, with three samples analyzed in each study. The results from 2010 to 2016 are shown below, as extracted from the same web site (<http://www.qasac-americas.org/ringdiagram>). The results are illustrated as 'ring diagrams' that identify whether the laboratory's results are 'good', 'satisfactory' or 'unsatisfactory' based on WMO's international quality standards. A description of the ring diagrams, extracted from the web site <http://www.qasac-americas.org/ringdiagram>, is as follows:

**The Quality Assurance
Science Activity Centre – Americas**

Helping ensure the high quality of
precipitation chemistry measurements

HOME
PRECIP CHEM MANUAL
STUDY RESULTS
RING DIAGRAMS
LAB STUDY 56
SCIENCE ADVISORY GROUP

Ring Diagrams Overview

GOOD - Green Hexagon

Measurement is within the interquartile range (IQR), defined as the 25th to 75th percentile or middle half (50%) of the measurements. Examples: sulfate, ammonium, sodium, and potassium.

SATISFACTORY - Blue Trapezoid

Measurement is within the range defined by the median \pm IQR/1.349. The ratio, IQR/1.349, is the non-parametric estimate of the standard deviation, sometimes called the pseudo-standard deviation. Examples: nitrate, chloride, and calcium.

UNSATISFACTORY - Red Triangle

Measurement is outside the range defined by the median \pm IQR/1.349. Examples: pH, conductivity, and magnesium.

DETECTION LIMIT - Open Circle

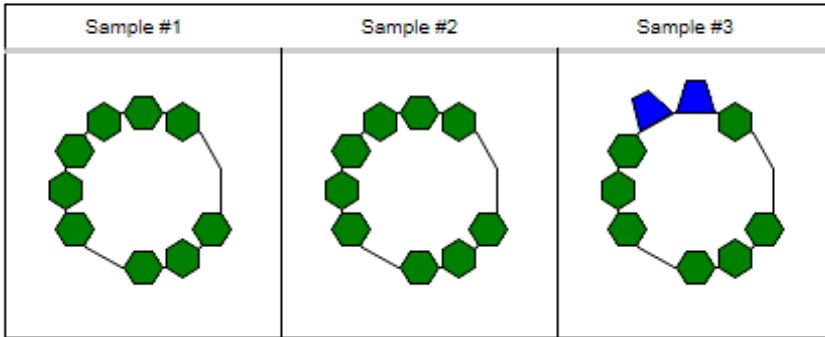
Measurement is below the detection limit of the laboratory's analytical method. Example: fluoride.

Notes:

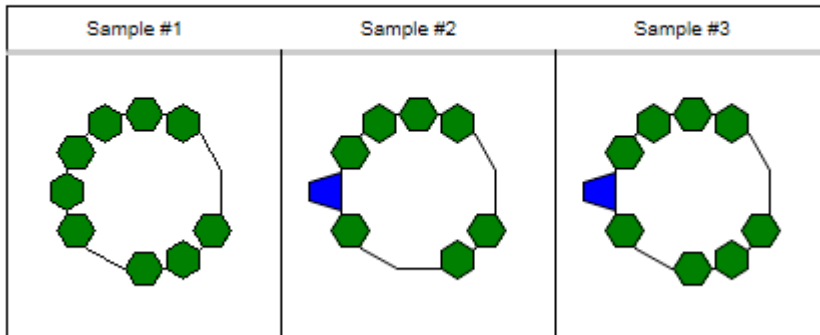
1. An outward pointing trapezoid or triangle indicates the measurement is high. An inward pointing trapezoid or triangle indicates the measurement is low.
2. A hexagon or trapezoid with cross-hatching (for example: potassium) indicates a measurement that meets the GOOD or SATISFACTORY definition but fails the measurement Data Quality Objective (DQO), defined in the *Manual for the GAW Precipitation Chemistry Programme* and listed in Table 1, below.
3. A straight line without a symbol indicates no measurement was reported. For example: acidity.

The CAPMoN Laboratory performance results for all studies from 2010 to 2016 appear in the ring diagrams that follow. The title above each diagram indicates the CAPMoN Laboratory number and country (700011 Canada) and the year and number of the Laboratory Intercomparison Study (e.g., LIS 2016 55).

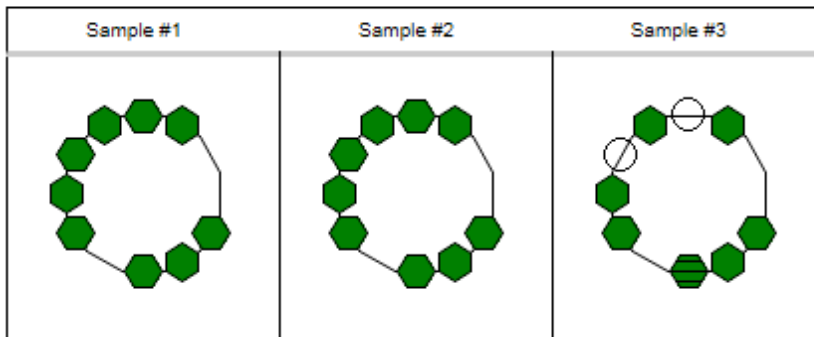
Lab 700011 Canada, LIS 2016 55 Ring Diagrams



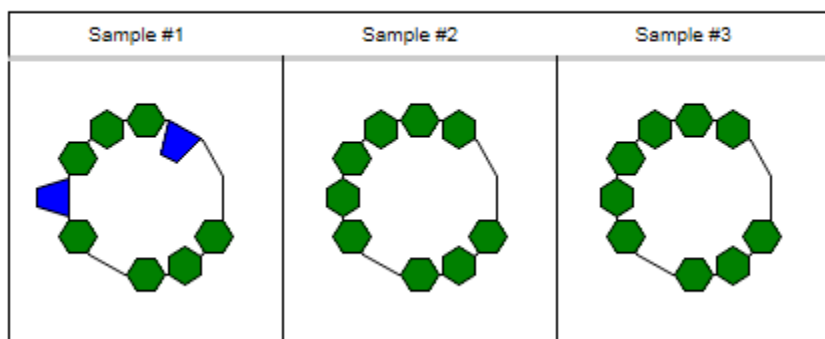
Lab 700011 Canada, LIS 2015 53 Ring Diagrams



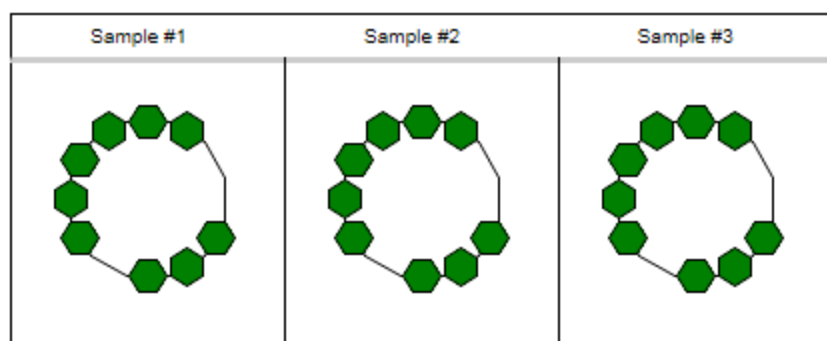
Lab 700011 Canada, LIS 2016 54 Ring Diagrams



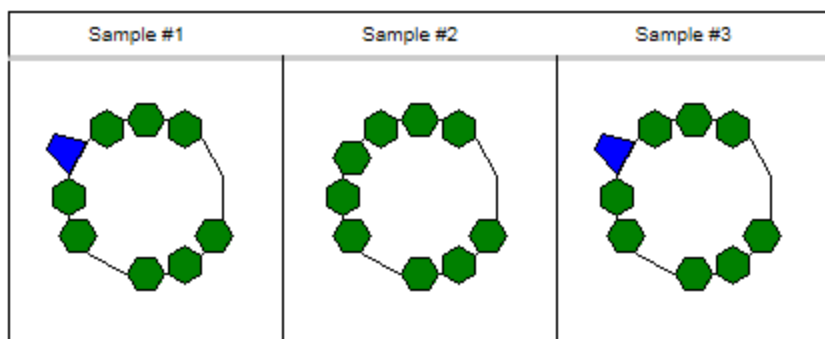
Lab 700011 Canada, LIS 2015 52 Ring Diagrams



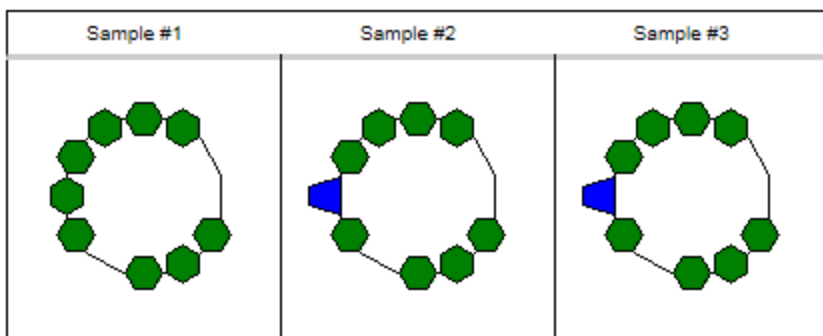
Lab 700011 Canada, LIS 2014 51 Ring Diagrams



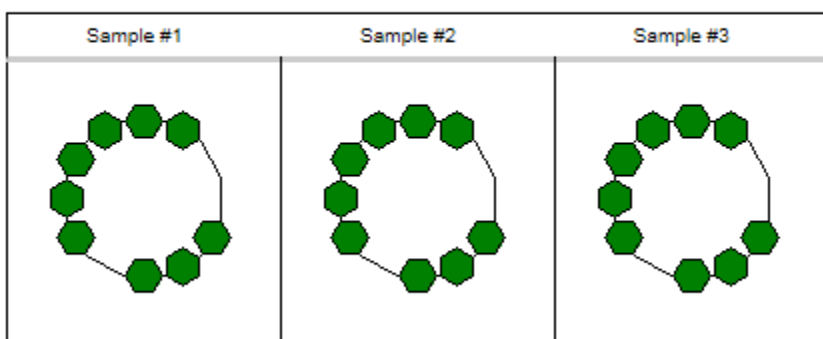
Lab 700011 Canada, LIS 2014 50 Ring Diagrams



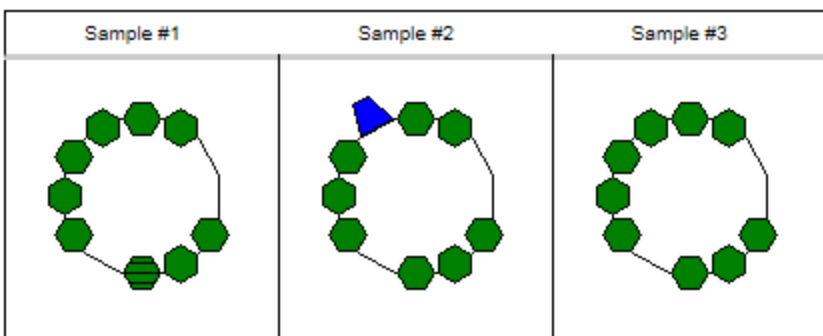
Lab 700011 Canada, LIS 2013 49 Ring Diagrams



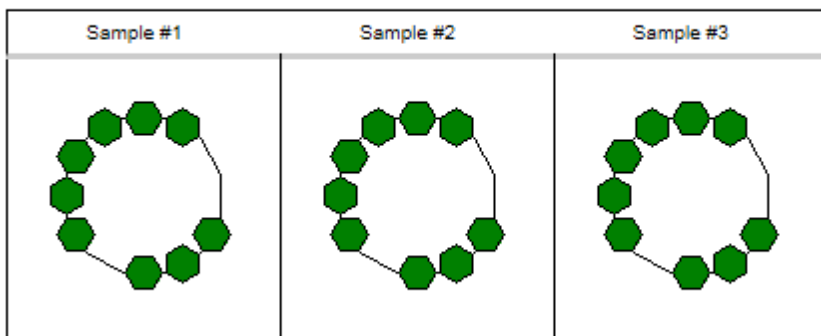
Lab 700011 Canada, LIS 2013 48 Ring Diagrams



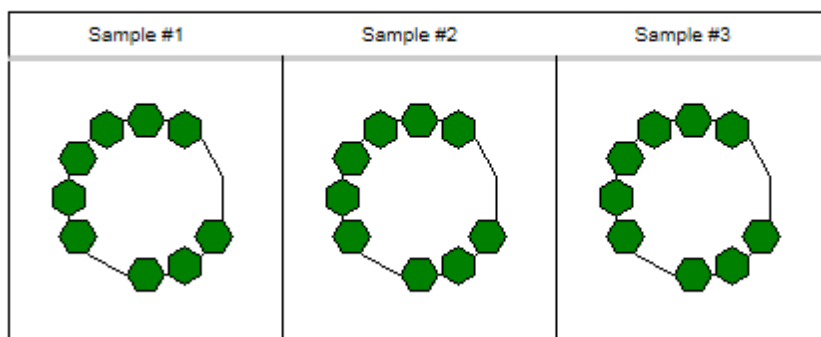
Lab 700011 Canada, LIS 2012 47 Ring Diagrams



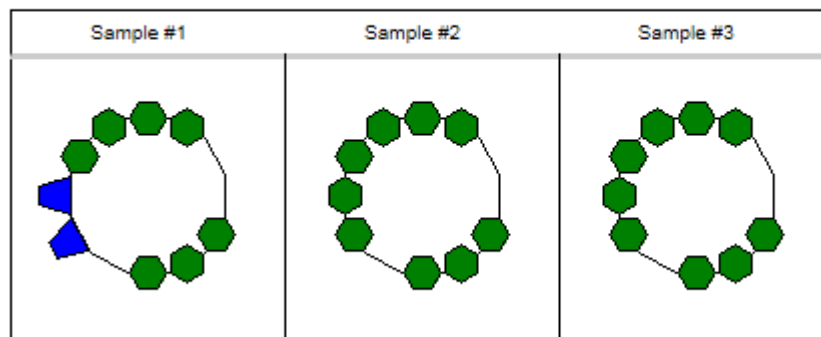
Lab 700011 Canada, LIS 2012 46 Ring Diagrams



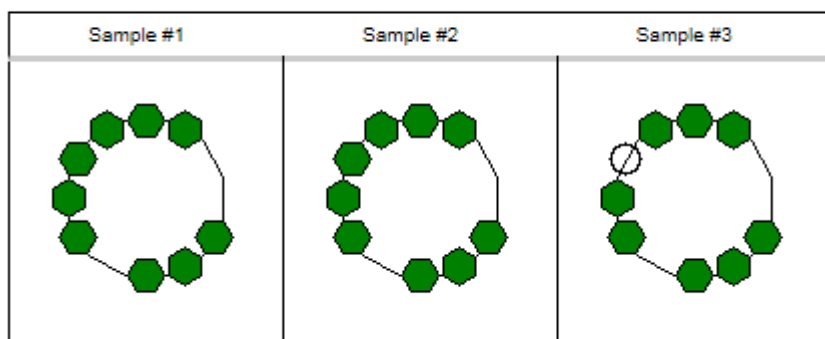
Lab 700011 Canada, LIS 2011 45 Ring Diagrams



Lab 700011 Canada, LIS 2011 44 Ring Diagrams



Lab 700011 Canada, LIS 2010 43 Ring Diagrams



Lab 700011 Canada, LIS 2010 42 Ring Diagrams

