The Province of British Columbia’s Approach to CONTINUOUS WATER-QUALITY SAMPLING PROGRAMS

Part 2 – Quality Assessment

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Validation Steps

1. **Forms** – ensure they are complete
   1) Station Design
   2) Station Log & Maintenance
   3) Portable Sensors Specifications
   4) Field & Lab Data
Validation Steps

2. Determine the Data Grades

(based on:
Sensor Error = Fouling + Calibration Drift)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (≤ 100 µS/cm)</td>
<td>≤ ± 0.2 °C</td>
<td>&gt; ± 0.2 to 0.4 °C</td>
<td>&gt; ± 0.4 to 0.6 °C</td>
<td>&gt; ± 0.6 to 0.8 °C</td>
<td>&gt; ± 0.8 °C</td>
</tr>
<tr>
<td>Specific conductance (≤ 100 µS/cm)</td>
<td>≤ ± 3µS/cm</td>
<td>&gt; ± 3 to 6 µS/cm</td>
<td>&gt; ± 6 to 9 µS/cm</td>
<td>&gt; ± 9 to 12 µS/cm</td>
<td>&gt; ± 12 µS/cm</td>
</tr>
<tr>
<td>Specific conductance (&gt; 100 µS/cm)</td>
<td>≤ ± 3% of reading</td>
<td>&gt; ± 3 to 6% of reading</td>
<td>&gt; ± 6 to 9 % of reading</td>
<td>&gt; ± 9 to 12 % of reading</td>
<td>&gt; ± 12 % of reading</td>
</tr>
<tr>
<td>pH</td>
<td>≤ ± 0.2 pH units</td>
<td>&gt; ± 0.2 to 0.4 pH units</td>
<td>&gt; ± 0.4 to 0.6 pH units</td>
<td>&gt; ± 0.6 to 0.8 pH units</td>
<td>&gt; ± 0.8 pH units</td>
</tr>
<tr>
<td>Turbidity (≤ 40 NTU)</td>
<td>≤ ± 2 NTU</td>
<td>&gt; ± 2 to 4 NTU</td>
<td>&gt; ± 4 to 6 NTU</td>
<td>&gt; ± 6 to 8 NTU</td>
<td>&gt; ± 8 NTU</td>
</tr>
<tr>
<td>Turbidity (&gt; 40 NTU)</td>
<td>≤ ± 5 % of reading</td>
<td>&gt; ± 5 to 10% of reading</td>
<td>&gt; ± 10 to 15% of reading</td>
<td>&gt; ± 15 to 20% of reading</td>
<td>&gt; ± 20% of reading</td>
</tr>
<tr>
<td>Dissolved oxygen (≤ 4 mg/l)</td>
<td>≤ ± 0.2 mg/L</td>
<td>&gt; ± 0.2 to 0.4 mg/L</td>
<td>&gt; ± 0.4 to 0.6 mg/L</td>
<td>&gt; ± 0.6 to 0.8 mg/L</td>
<td>&gt; ± 0.8 mg/L</td>
</tr>
<tr>
<td>Dissolved oxygen (&gt; 4 mg/l)*</td>
<td>≤ ± 5 % of reading</td>
<td>&gt; ± 5 to 10% of reading</td>
<td>&gt; ± 10 to 15% of reading</td>
<td>&gt; ± 15 to 20% of reading</td>
<td>&gt; ± 20% of reading</td>
</tr>
</tbody>
</table>
Validation Steps

3. Compare Data
   In situ vs bucket
   Possible reasons for differences

4. Examine the sampling period data
Abrupt changes

Malfunction or out of Water

Abrupt change in turbidity
Prolonged gradual change

Prolonged constant change
Validation Steps

5. Flag unrealistic data

Determine % Flagged
Data Grades and Sensor Performance

1. Quality of the sampling period data
2. Accuracy of re-deployed sondes
3. Assess length of sampling period
DATA REPOSITORY

General Station Information (RISC Forms)
- Station Design,
- Portable Sonde Specifications
- Station Log & Maintenance Record

Sampling Period Data (Data Logger)

Field & Laboratory Data (RISC Forms)

Flag Unreasonable Data

Determine Data Grade (sensor error)

Data Stored & Released with Data Grade

Post-release Processing & Analyses