Explanation of DataMaster DMT "Datapoints", Subject Test Graph, and Final Alcohol Measurement

The DataMaster DMT is the evidential breath testing instrument currently in use in the State of Alaska. The purpose of the instrument is to determine the subject's breath alcohol concentration measured in the statutory units of g/210 L (grams of ethanol per 210 liters of breath). The information below is specific to the Alaska DataMaster DMT software and may not be applicable to any other application.

During a subject test sequence, the subject is allowed 2 minutes to provide a breath sample that meets the minimum sample acceptance requirements:

1. A minimum breath flow rate of 3 liters per minute (L/M)
2. A minimum breath volume of 1.5 liters (L) of air provided in a single **attempt**
3. A **plateau** in the breath alcohol concentration (g/210 L)

An **attempt** begins when a subject blows through the breath hose with a breath flow rate of at least 3 L/M and ends when the flow rate drops below 3 L/M. An attempt must consist of at least 3 consecutive flow measurements of 3 L/M or greater. All sample acceptance requirements must be met within a single attempt for the breath sample to be accepted. The breath volume of each attempt is independent; the volumes are not added together to meet the minimum of 1.5 L of breath. A maximum of 10 attempts is allowed within a single subject test sequence.

While a subject is blowing through the breath hose, the DataMaster DMT records flow and detector readings each ¼ second (4 times per second). Flow readings are recorded as-is in the .gph file, one of the files comprising the digital breath test record. Flow readings are used to plot the Flow Rate (dotted) line that appears on the Subject Test printout. To determine the breath volume (L) of a single attempt, each flow rate value for a single attempt is divided by 240 and the resulting values are added together. When an accepted breath sample is provided, the breath volume (L) of that attempt appears on the Subject Test printout in parentheses on the Subject Sample line.

For detector readings, two consecutive ¼ second readings are averaged. This average is stored in the .gph file in parts per million (PPM). PPM values are converted to g/210 L by dividing the PPM value by 2605. The g/210 L values are used to plot the Alcohol (solid) line that appears on the Subject Test printout. The difference between consecutive averages is referred to as the **slope**. A slope may be positive (greater than 0.001 g/210L), negative (less than -0.001 g/210 L), or flat (0.001 to -0.001 g/210L).

A **plateau** is defined as a **slope** between 0.001 and -0.001 g/210 L, inclusive. The detector averages used to determine the **plateau** are the last 2 during which the flow rate is at least 3 L/M.

When a subject sample has met the sample acceptance requirements, the sample chamber is sealed, and the final measurement occurs. The result of this measurement (in PPM) is stored in the .XML file as <finAlc>. This PPM measurement is converted to g/210 L by dividing by 2605. This is the value that appears in the Subject Sample for a completed test sequence.

Notes Regarding the Graph and .gph File:

- The .gph file is sometimes referred to as the "datapoints".
- Values are added to the .gph file only until the end of any **attempt** that meets the sample acceptance criteria OR the end of the Subject Sample allowed time (2 minutes). The final breath alcohol measurement occurs *after* the sample has been accepted. Therefore, the final measurement does not appear in the .gph file and is not plotted on the Alcohol graph.
- The *direction* of the **slope** (up or down) of the Alcohol line may be determined by looking at the graph. However, the *magnitude* of the **slope** cannot be determined visually due to scaling of the Alcohol line in response to the detector readings while a subject is blowing.
- "Datapoints" are not routinely examined when Crime Lab personnel prepare for testimony. They are used to construct the graph that already appears on the Subject Test printout. This information is considered Level 3, non-routine discovery (refer to Quality Assurance Manual, Policy 5 – Report and Discovery Dissemination).

Name: _____ Date: 11/18/2022

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