

## **TO-15 Results – Frequently Asked Questions (FAQ):**

**Q:** What does a “U” in the “Q” (qualifier) column next to a compound mean?

**A:** A “U” (undetected) qualifier means we did not detect that compound in the sample.

**Q:** Why are there values listed in the “Results ppbv” and “Results ug/m<sup>3</sup>” columns for that compound if it was undetected?

**A:** When a compound is undetected, the value for ppbv and ug/m<sup>3</sup> is the Reporting Limit (RL) for that compound, that is, it ***could*** be present at less than the values stated, but those values are as low as we are able to report under normal circumstances.

**Q:** Why do the listed ppbv and ug/m<sup>3</sup> values differ for undetected compounds?

**A:** Different compounds can have different detection limits. Most all compound RLs are reported at 0.5 ppbv, however some very common compounds are reported slightly higher. This is often a function of what other similar compounds are present, or how much of a particular compound is present. The ug/m<sup>3</sup> RLs vary due to the different molecular weights of each compound.

**Q:** Why are there different numbers in the “Results ppbv” and “Results ug/m<sup>3</sup>” columns?

**A:** They are two different ways of expressing an air concentration, ppbv is a volume / volume concentration, while ug/m<sup>3</sup> is a weight / volume concentration. If you know the concentration in one unit, and the molecular weight of the compound, you can easily convert it to the other, e.g.;

$$\mathbf{X \text{ ppbv} = (Y \text{ ug/m}^3) \times (24.45)/(\text{molecular weight})}$$

$$\mathbf{Y \text{ ug/m}^3 = (X \text{ ppbv}) \times (\text{molecular weight})/24.45}$$

**(24.45 is the gas molar value, a constant)**

**Q:** What is meant by the “Method Detection Limit”?

**A:** The Method Detection Limit (MDL) refers to the non-zero amount of the compound in question that we can identify in a scientifically-sound manner. Essentially we have to be able to see a peak on the chromatogram that is higher than three times the standard deviation of the same peak in the blank. If it does not meet this minimum, we cannot say we detected it. The values found on your Form 1s are “Reporting Limits” (RLs) which are higher than MDLs.

**Q:** Where can I find (gasoline, diesel, fuel oil, natural gas, propane, LPG) in my sample?

**A:** These materials are mixtures of several different compounds. Because the analysis identifies molecules, these mixtures are elucidated indirectly. Additionally, each of these mixtures contain one or more compounds that are characteristic of other mixtures, for example, gasoline contains

n-hexane, n-heptane, benzene, toluene, ethylbenzene, and xylenes, as does diesel fuel, though diesel fuel also contains other, heavier hydrocarbon molecules.

Similarly, LPG, also known as liquefied petroleum gas (often referred to interchangeably as “propane”) may contain propane, but also many other light hydrocarbon molecules, including some found in gasoline too. Identifying which mixture goes with which compounds is a bit of an art, and requires some background information to do accurately.

**Q:** What does “RT” mean on my Library Search results?

**A:** RT stands for Retention Time, referring to the length of time from the injection of the sample into the GC column to when a particular molecule exits the column and passes into the Mass Spectroscopy detector.

Retention time is a function of molecule size and mass, the functional groups attached, and the polarity of the molecule relative to the column packing, and is characteristic, meaning every organic molecule has an associated retention time that assists in identification. In general, smaller, lighter, less polar molecules elute first, and larger, heavier, more polar ones elute later.

**Q:** What is an “unknown” in the Library Search?

**A:** This means a compound eluted from the GC column and was detected, but that its ion fragmentation pattern was not close enough to any peak in the library to identify it.

**Q:** Why are all of my Library Search compounds qualified as “Estimated”?

**A:** Because the instrument is not calibrated for these compounds, we can only estimate and tentatively identify them. This is usually fine for indoor air quality testing.

Having said that, these tentative IDs are made versus a NIST library, the match quality is greater than 90%, and that there is a strong correlation to the likelihood that the compound is what the library match says it is. Also, the higher the concentration, the more likely it is to be accurate.

**Warranty:** EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

**Limits of Liability:** In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL’s services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder. **Indemnification:** Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney’s fees, incurred by reason of any third party claim in connection with EMSL’s services, the test result data or its use by client.