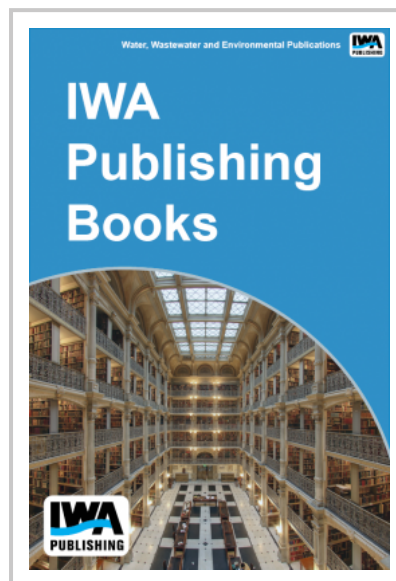


# Low Phosphorus Analytical Measurement Study

Phosphorus measurements at very low concentrations have been tested and proven to be unreliable. The establishment of stricter phosphorus discharge requirements has challenged the wastewater facilities to be capable of measuring low phosphorus concentrations (20 µg/L) in the effluent. The major challenge associated with low phosphorus measurements seems to be related to the sample matrix and the digestion methodologies. The results of total phosphorus measurements in wastewater effluent, high quality deionized water samples, and orthophosphate measurements in wastewater effluent samples show a broad variability. In contrast, the orthophosphate measurements in the deionized water matrix spiked to 3 µg/L and 6 µg/L show an insignificant variability. The Ascorbic Acid Method seems to be a reliable technique to measure orthophosphate at low levels. The findings of the current study have demonstrated that as the phosphorus concentration increases, the variability decreases. A good reliable analytical process is needed to provide information to regulators for setting sound permit limits and by utilities required to meet those limits. Current methods show significant variability at very low (<20 µg/L) concentrations when measuring total phosphorus and orthophosphate.

This study provides important information regarding the capability of wastewater and commercial laboratories to determine low phosphorus concentration (0-20 µg/L) accurately. The findings of this study raises some important questions regarding establishing permit limits and the ability of utilities to comply with the limits. Measurements to comply with very low limits (<20 µg/L TP) will inherently vary, making it impossible to determine both the environmental impact of the discharge stream and the performance of the utility.



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