

# Next Generation Sequencing (NGS) technical highlights

## What is NGS and how can it help my process?

For almost 50 years, nucleotide sequencing of DNA and RNA has been used to understand the human genome and the genomes of certain pathogenic and non-pathogenic organisms for research and medical purposes. Due to the cost, effort and time required to perform sequencing, this method was prohibitive for mainstream use/industries. Fast forward to now: we see consumers using nucleotide sequencing kits to understand their health, traits and ancestry. Industry has jumped on the bandwagon too, using Next Generation Sequencing (NGS) as a novel way for users to gain insight into the health and performance of their processes. This deep insight helps companies understand cause and effect relationships certain microbes have on their processes – good or bad – as well as see trends and triggers for further investigation. With this data, companies can then apply a more targeted treatment, saving them money, time, and frustration.

## What makes LuminUltra's GeneCount NGS service unique?

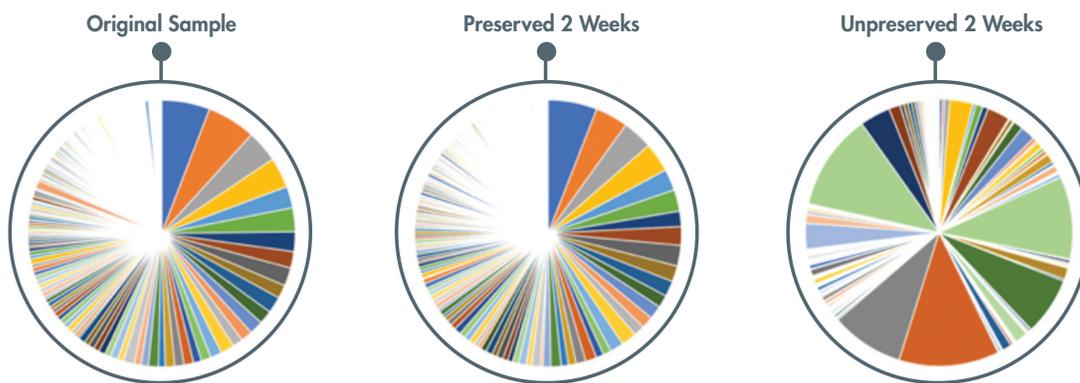
### Sample Preservation Technique is convenient and delivers accurate results:

LuminUltra's new simplified 5-minute sample preservation method has the following benefits:

- allows the microbiome to be preserved *as sampled* giving the most accurate results, regardless of location or time of sampling, thus maintaining integrity during transport.
- samples can be shipped at ambient temperatures via standard mail – no need for cold chain shipping which can be costly and not readily available.

Proper sample handling is key to ensure you're taking action on representative results!

Below is a microbiome breakdown based on NGS testing of an original sample, compared to the same preserved and unpreserved sample tested two weeks later.



### Two-week turn-around to NGS results:

Our turn around time of two weeks from receipt of sample, gives you a head start to making more timely decisions on the microbes impacting your system, and ultimately affecting your bottom line.

### Did you know?

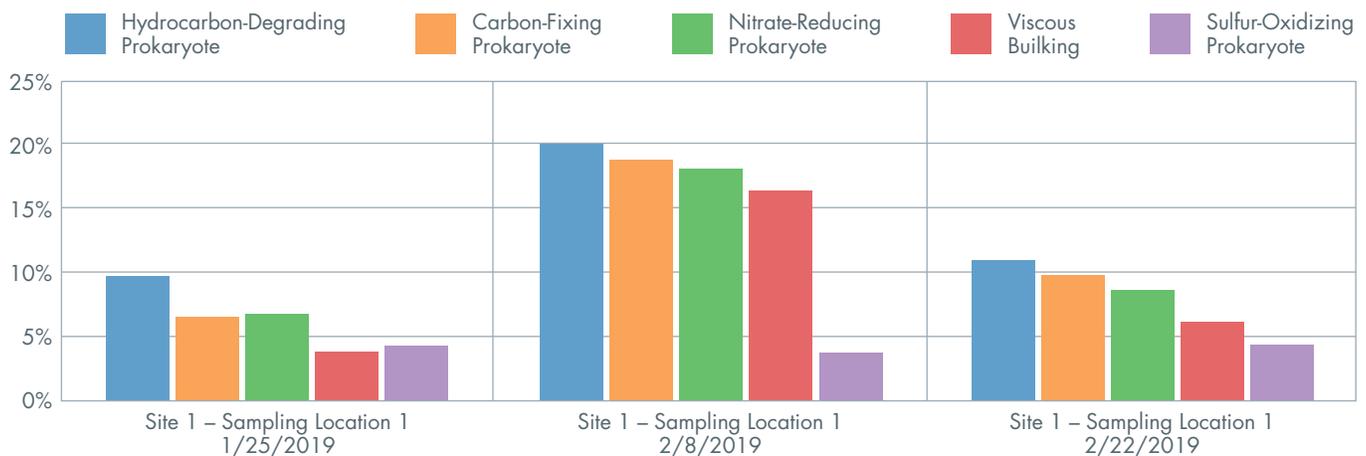
*Once a sample of microorganisms has been isolated from its environment, the quantity and abundance of microorganisms will start to change. Some samples are more prone to changes, especially if their source of nutrients has been removed or the amount of oxygen in their environment has changed drastically.*

## Cell Counts deliver valuable pieces of information:

We include a Total Prokaryote qPCR assay in our service so that the total concentration of combined bacterial and archaeal cells can be estimated. Combined with the relative abundance results from sequencing, this allows the calculation of estimated concentrations of each organism present in your sample in cells per mL, g or surface area. Having both the relative abundance and an estimate of the cell counts for each organism is valuable information to have in assessing your system.

## Data is consolidated in one location, and actionable:

In addition to the pdf and raw data files provided after testing and reporting, your data will also be available online through our NGS Dashboard in an interactive format. This allows you to review trends over time, compare results from different locations, and look further in depth into what organisms make up your population. You will also receive information on their metabolic activities, such as ammonia oxidation and sulfate-reduction, that are relevant to your system. The consolidation of all this powerful data in one location allows for informed decision-making.



## Best in class solutions from LuminUltra

For almost two decades LuminUltra has pioneered solutions to monitor for microbes in the municipal, industrial and oil & gas sectors, gaining unique insight into the microbiological challenges operators and managers face when trying to monitor and understand their systems/processes. As technology evolves, so does LuminUltra, as shown by our many patents for ATP and DNA-based offerings. Based on new R&D work, our DNA preservation, extraction and interpretation procedures will be upgraded to reflect this new research. Our bioinformatics database used to classify organisms is always being revised, based on the discovery of new organisms, or of newly uncovered metabolic functions. NGS combined with industry-specific insights from our DNA experts makes LuminUltra's solutions very powerful.

**Contact us at [sales@luminultra.com](mailto:sales@luminultra.com) to learn more about NGS and how it can help you keep your process running optimally.**