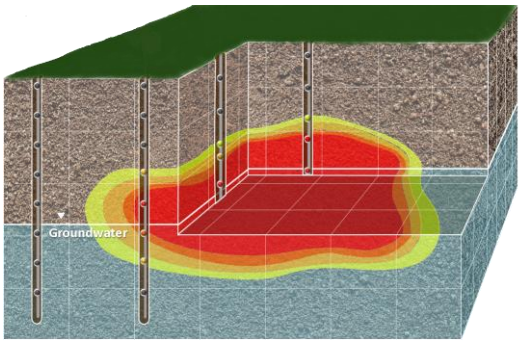
QuantArray-NSZD®



NSZD stands for "natural source zone depletion" and comprises naturally occurring processes of dissolving, volatilization and biodegradation of contaminant phases, especially petroleum-derived hydrocarbons (light non-aqueous phase liquid: LNAPL) in the subsurface.

Simultaneous quantification of both individual microorganism species and functional genes involved in the dissolution, volatilization and biodegradation of pollutant phases.

QuantArray-NSZD® is a molecular biological assay that simultaneously quantifies a wide spectrum of genes of the microorganisms involved in the mentioned above processes and their functional genes in one single analysis.
Methanogenesis is very important in this context. Biodegradation includes various microbial communities: methanogens, methanotrophs, sulfate reducers, iron reducers, denitrifiers, fermenting bacteria and acetogens, as well as biosurfactant producers and slime formers. 1., 2.
To determine these microbial communities and assess the potential for biodegradation of LNAPL in the source zone, we are now offering QuantArray®-NSZD assays as a collaborative partner of Microbial Insights Inc. which allows parallel quantification of numerous genes (see below) and, in conclusion, monitoring of the underlying processes.

Quantification of the following microorganisms, processes and genes

Total amount of microorganisms	Sulfate reduction	Iron reduction	Denitrification
Bacteria (EBAC) Archaea (ARC)	Sulfate reducing Bacteria (APS)	Iron-reducing Bacteria (IRB) Geobacter (IRG) Shewanella (IRS)	(nirK) (nirS)

Fermenting and acetogenic Bacteria	Methanogens/Methanotrophs	Biosurfactant producers	Slime formers
Fermenting Bacteria (FER) Acetogenic Bacteria (AGN)	Methanogens (MGN) Acetoclastic (AMGN) p. methane monooxygenase (PMMO) l. methane monooxygenase (SMMO)	Glycolipid (SurG) Liposaccharid (SurL) Lipopeptid (SurP) Trehalose (SurT)	Burkholderia cepacion exopolysaccahrid (BCE) Deinococcus spp. (DCS) Meiothermus spp. (MTS)

1. Johnson P, Lundegard P, Liu Z: Source zone natural attenuation at petroleum hydrocarbon spill sites—I: Site-specific assessment approach. Groundwater Monitoring & Remediation. 2006;26:82-92.

2. Pannekens M, Kroll L, Muller H, Mbow FT, Meckenstock RU: Oil reservoirs, an exceptional habitat for microorganisms. N Biotechnol. 2019;49:1-9

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