

## NewFields Note

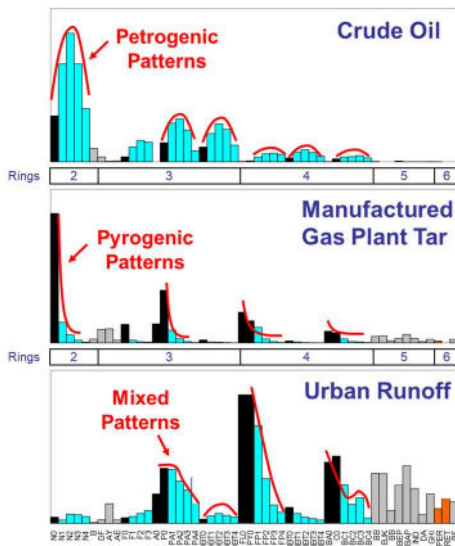
# Polycyclic Aromatic Hydrocarbons (PAHs)

**NewFields Note:** Technical information in a condensed, easily digestible format that is intended to promote environmental science education, knowledge transfer, and empowerment ... *one note at a time.*

**Polycyclic Aromatic Hydrocarbons (PAHs)** are ubiquitous in the environment. Some PAHs are acutely toxic and have carcinogenic properties and, as a result, they are heavily regulated. Establishing the source(s) of PAHs in the environment should be central to many site investigations.

Some PAHs form naturally from the degradation of plant debris in soil (**biogenic PAHs**) or during the formation of crude oil (**petrogenic PAHs**) over geologic time. The latter can enter the environment both naturally (crude oil seeps) or due to anthropogenic spillage/leakage of crude oils and refined petroleum products. Most PAHs, however, are formed by the incomplete combustion of organic matter (**pyrogenic PAHs**), such as wood, petroleum, coal or even garbage. Pyrogenic emissions and residues are often spread through the environment via runoff or atmosphere transport and occur as natural and/or anthropogenic background.

Distinguishing between the different sources of PAHs – and between contamination and background – can be achieved through chemical fingerprinting of source-specific alkylated PAHs and related aromatic compounds in addition to the few regulated (Priority Pollutant) PAHs.



Fresh **crude oil** is composed of a broad range of 2- to 4-ring *petrogenic* PAHs dominated by alkylated PAHs (bright blue) and contains only traces of higher molecular weight 5- and 6-ring PAH (grey).

Fresh **MGP tar** is comprised of a broad range of 2- through 6-ring *pyrogenic* PAHs, enriched in 2- and 3-ring PAHs, wherein each group of PAH is dominated by the parent (non-alkylated) PAHs (black and grey), i.e., most regulated Priority Pollutant PAHs.

**Urban runoff** contains 3- to 6-ring pyrogenic PAHs, enriched in 4- to 6-ring PAHs, again dominated by the parent PAHs (non-alkylated) PAHs (black and grey).

For additional information, please contact your NewFields Technical Lead. Or send us an email at [Science\\_Info@newfields.com](mailto:Science_Info@newfields.com)!

