



# Polyaromatic Hydrocarbon Treatment

newterra treatment solutions for contaminated groundwater and wastewater

## About Polyaromatic Hydrocarbons (PAHs)

Polyaromatic hydrocarbons (PAHs) are a set of compounds that can be found on many remediation projects. Due to their low solubility and high melting temperature, they are commonly found in soil and sediment samples on petroleum based contaminated sites and are common when processing water with high TSS and free product.

The PAH compounds that are most strictly regulated are the compounds with low soluble in water and include: acenaphthene, acenaphthylene, anthracene, benz[a]anthracene, benzo[a]pyrene, benzo[e]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[j]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, fluoranthene, flourene, indeno[1,2,3-c,d]pyrene, phenanthrene, and pyrene. As regulations become more stringent, effluent limits for these compounds are often set down the parts per trillion range making it challenging for water treatment designers to meet treatment objectives.

The smaller PAH compounds like Napthalene, 1-Methylnapthalene and 2-Methylnapthalene are more soluble and typically found in higher concentrations in the contaminated water streams. These compounds are not usually regulated down to the part per trillion range but can often be the compounds first to break through when treating a PAH impacted wastewater stream.

## newterra would typically deploy the following technologies when treating PAH compounds in a remediation project.

### Oil Water Separators

PAH compounds tend to be mobilized in free product and found on sites with high levels of free product. **newterra** Oil Water Separators provide an economical method of removing free product with specific gravities less than 0.9 and greater than 1.1. In applications where free product is mixed with solids separators will be designed to operate without packing media to prevent O&M challenges.

### Coagulation, Flocculation, Clarification

Due to the low solubility and high melting temperatures of PAH compounds, these compounds are often bound to silt particles and can found in sedimentation layers at the bottom of contaminated lakes, ponds and harbours. When treating PAH compounds in these scenarios where there is not free product present, **newterra** will remove the silt and TSS as the first step utilizing conventional coagulation flocculation and clarification. Our **Longbox Clarifier**<sup>®</sup> has been developed as a modular prebuilt clarifier to allow for quick installation and setup on sites and integrates well in to our modular plants.

### Dissolved Air Floatation

When PAH compounds are found on sites with high suspended solids and free product or high iron content and free product, **newterra** will design and implement chemical assisted Dissolved Air Floatation (DAF) systems to remove floating, sinking and emulsified free phase liquids along with settleable solids and precipitating metals. These compounds, when combined together, are not easily removed with conventional oil water separators and clarifiers and can pose operational issues if not effectively removed prior to downstream media vessels.

### Multimedia Filtration

Multimedia Filtration is typically implemented down stream of clarifiers and DAFs as a cushion and polishing step for TSS and silt bound PAH compounds. Multimedia Filtration systems are sized and designed specifically to target the smaller particles that can break through the upstream treatment and achieve optimal removal efficiency for those particulate like compounds.

### Organo Clay Media

**newterra** applies sacrificial Organo Clay media for removing the larger molecular weight, low solubility PAH compounds. This media is more suitable for removal of these larger molecules and provides an additional mechanism for removal of silt bound hydrocarbons in advance of Activated Carbon.

### Granular Activated Carbon Media

The last step in treatment of PAH compounds is Granular Activated Carbon (GAC). **newterra** will select specific media that works best with target PAH compounds and size the GAC vessels specifically to optimize performance of the media and achieve the low part per trillion limits often enforced by regulators.

### Cartridge Filtration Polishing

Cartridge filters on the GAC effluent add a last line of defence for silt bound PAH compounds. Cartridge filters also double as a safety net for capture of solids and particulate contamination in the event of a system upset.

Meeting part per trillion limit on heavily contaminated sites can be challenging and requires multiple layers of conservative treatment to consistently meet the effluent limits. With many years of experience treating PAH compounds, **newterra** can help with your current project requirements. Please contact to discuss the application.

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