



## BIOLOGICAL AMENDMENTS FOR SOIL & GROUNDWATER REMEDIATION

*Bioremediation is more than just bacteria. Our amendments include petroleum-degrading cultures, critical nutrients, biosurfactants, secondary electron acceptors, and substrates to support complete degradation of ...*

- **GASOLINE/BTEX**
- **MTBE**
- **DIESEL**
- **HEATING OIL**
- **NAPHTHALENES**
- **AVIATION FUEL**
- **JP-4, JP-5, JP-8**
  
- **PCE**
- **TCE**
- **DCE**
- **VC**
- **PCP**
- **HEAVY METALS**

*...and more!*

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ETEC produces specific biological amendments to stimulate and enhance degradation of petroleum hydrocarbons and chlorinated solvents. These amendments are summarized below. Product MSDS sheets are available at [www.etecllc.com](http://www.etecllc.com)



### AMENDMENTS FOR PETROLEUM HYDROCARBON DEGRADATION

#### **PETROBAC™ STIMULANT BUNDLE**

These liquid enhancements include A2™, our hydrocarbon-degrading bacterial consortia, and EA™, a dilute surface-active agent that encourages slow desorption of adsorbed soil contaminants into the aqueous phase, where they can be subsequently degraded. Especially effective, for gasoline, diesel, and light oil-range compounds.

#### **CUSTOM BLEND NUTRIENTS (CBN™)**

Our most important amendment, CBN™ is a balanced blend of macro-nutrients (nitrogen, phosphorus, and potassium), micro-nutrients, and secondary electron acceptors (nitrate and sulfate). These nutrients are essential building blocks that all bacteria need in order to produce new cell mass and perform various cellular functions. Bacteria utilize macro-nutrients in a Carbon:Nitrogen:Phosphorus ratio of 100:10:1. Therefore, in order to degrade 1,000 lbs. of TPH, a minimum of 100 lbs of Nitrogen and 10 lbs. of Phosphorus will be utilized by the microbial population. These masses of nutrients are not naturally available in most groundwater systems, and must be supplied externally during active bioremediation in order to ensure un-inhibited contaminant degradation. CBN is a dry powder that is fully water-soluble, and is sold in 50 lb. increments.

#### **PETROSOLV™ BIOSURFACTANT**

PetroSolv™ is a biodegradable, non-ionic surfactant specially-formulated for soil flushing and enhanced free product recovery of gasoline and diesel fuel.

### AMENDMENTS FOR REDUCTIVE DECHLORINATION

#### **CARBSTRATE™**

Carbstrate™ is a soluble, food-grade, nutrient-amended electron donor that is easily transported through groundwater formations to maximize plume-wide dechlorination at an ultra-competitive price. Carbstrate™ is a carbohydrate-based dry powder that is fully water-soluble, and is sold in 30 lb. increments.

#### **NUTRICHOR™**

NutriChlor™ is a blend of inorganic compounds and trace metals that are critical for growth of sensitive anaerobic microbial species, especially those that play important roles in the reductive dechlorination process. Intended for use with any electron donor substrate (i.e. lactate, edible oils, etc.).