

BIOAMENDMENTS

SUBSURFACE INJECTIONS, LANDFARMS, SURFACE APPLICATIONS

Don't just add dissolved oxygen (DO) when you should add the complete package of bacteria, multiple electron acceptors, nutrients, and a surfactant for less cost!!! These in situ products provide fast, complete biodegradation of ...

- GASOLINE
- DIESEL
- BTEX
- NAPHTHALENES
- PAHS
- CIS-DCE AND VC
- ORANGIC SOLVENTS
- PFOS/PFOA
- PCP
- PESTICIDES

Obtain GCTLs/NADCs in a reasonable time frame!

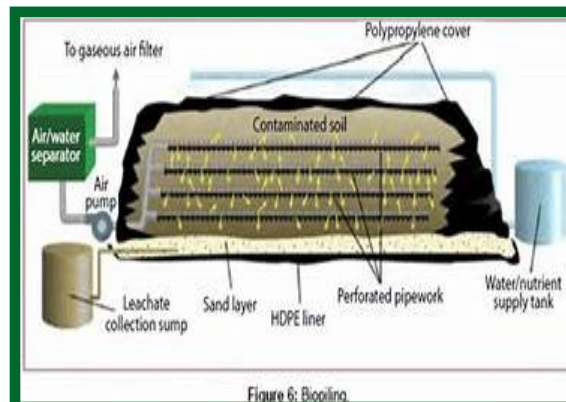
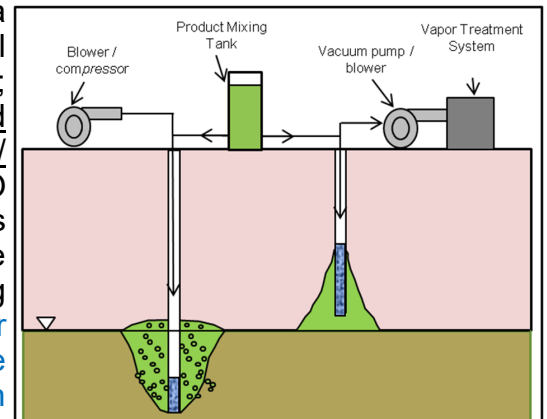


INNOVATIVE REMEDIAL SOLUTIONS, INC

Bioremediation is a highly flexible and robust technology that can be designed and implemented to fit a wide range of site-specific conditions. Environmental consultants are using bioremediation products (i.e. bioamendments) in a variety of methods, such as:

- In Situ Groundwater Recirculation
- In Situ Injections via Direct Push
- Open Excavation Applications
- In Situ Passive Biobarriers
- Biosparge Systems
- Enhanced DPE/MPE and P&T Systems
- Ex Situ Landfarming
- Ex Situ Biopiles
- Bioreactors
- Surface Applications and Vadose Flooding

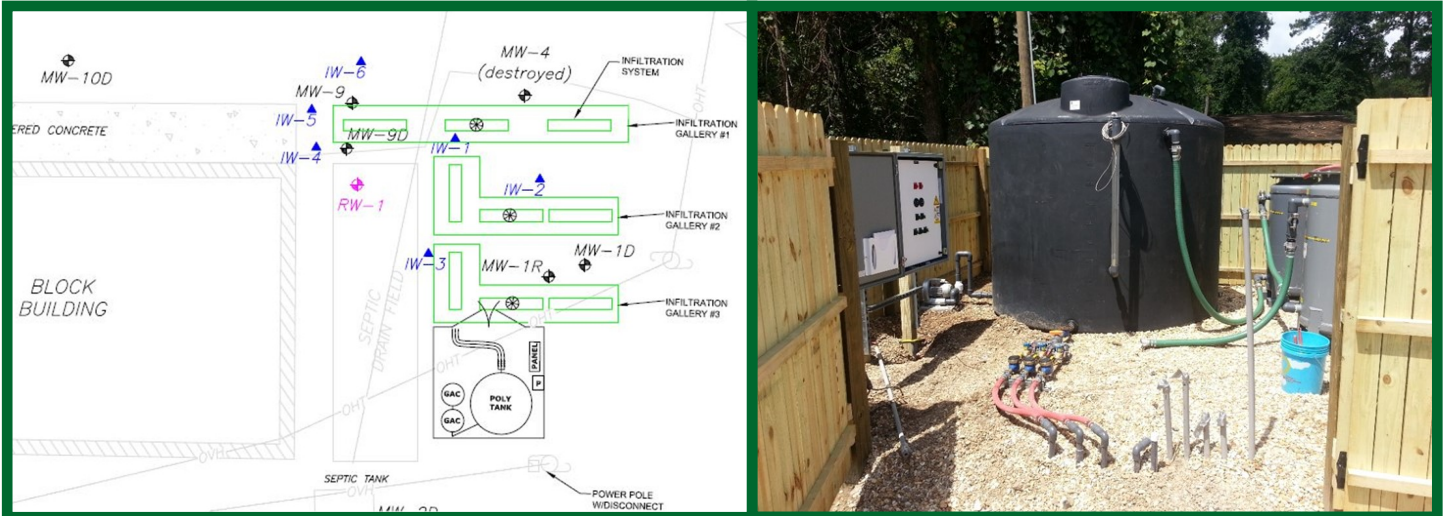
These remedial methods have a high rate of achieving low-level remedial goals for soil/groundwater; however, the bioamendments used must contain the proper chemicals/bacteria and be cost-effective. DO and other electron acceptors (nitrate and sulfate) are only one critical component for stimulating effective bioremediation. Other fundamental requirements include nutrients (N, P, K) a desorption agent (bioremediation only occurs in the dissolved phase!), and the addition of facultative hydrocarbon-degrading bacteria. Used in combination with the properly engineered delivery approach and infrastructure, all of these components will produce rapid, measurable biodegradation.



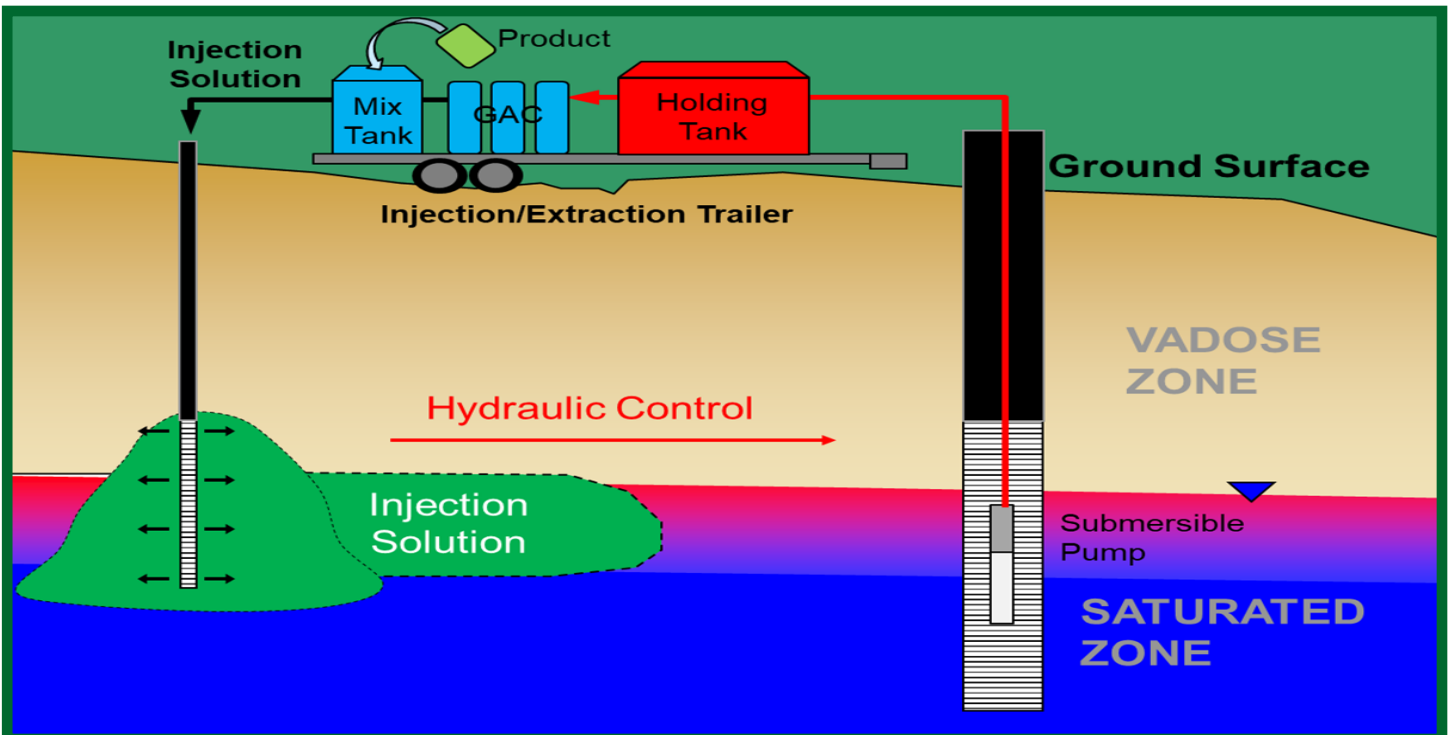
IRS's BIOAMENDMENTS

IRS's products provides all of the fundamental requirements for successful bioremediation of soil/groundwater, as follows:

- Critical macronutrients (N and P)
- Multiple electron acceptors (DO, nitrate, and sulfate) that are required for microbial activity
- Facultative (aerobic/anaerobic) petroleum-degrading consortium
- Biosurfactant blend to desorb soil contaminants, increasing bioavailability.



IRS's approach is to **obey the fundamental laws** of bioremediation by obtaining contact via a volumetric approach and adding the correct mass of soluble electron acceptors (DO, nitrate, and sulfate) based on the mass of contamination. These products are **all highly soluble** and can be applied rapidly in a variety of soil types and infrastructure (AS/SVE, MPE/DPE, trenches, direct push, etc.).



IRS can apply these products for you, or you can apply them yourself. Our engineers, field technicians and equipment are Florida-based and ready to assist you!