



ABOUT BIOREM

Biorem Solutions is an exclusive distributor to a number of green, environmentally friendly, uniquely Microbial and Bio-based Chemical technologies from the United States. The promoter Directors Mr. Shekar Iyer and Mr. Shyam Kumar, have over 3 decades of experience in Project Management and Operations in varied fields.

EnviroLogic Biobased Technologies Inc, USA, is a leading manufacturer of products in the field of Environmental Biotechnology, since 1993. They have researched the natural process and technology of bioremediation and manufacture synergistic systems of bio-remedial products, under the Spillaway Brand™.

Green World Innovations Corp., USA and its consortium, manufactures biodegradable and environmentally friendly, industrial grade of degraders under the De-Oil-It™ Brand, that allows nature to break down hydrocarbons and reintroduce them back into the environment.



Biorem Solutions addresses needs such as

- 1. Hydrocarbon clean-up and restoration**
- 2. Power & Desalination, Dairy processing plants**
- 3. Degreasing and Industrial cleaning**
- 4. Industrial sites clean-up**
- 5. Water bodies clean up / Restoration of Lakes**

WHAT IS BIO-REMEDIATION ?

- Uses naturally occurring, safe and non-genetically modified beneficial micro-organisms to degrade environmentally harmful contaminants and turns them into non-toxic compounds.
- Breaks down hydrocarbons and transforms them into CO₂ & H₂O.
- Use Nanotechnology chemistry to break HC, and achieve remediation through either bio-stimulation or bio-augmentation.

BIO-REMEDIATION DEGRADES FOLLOWING:

- Hydrocarbons with carbon chains covering from C-5 to C-90.
- Benzene, Xylene and Toluene.
- TCE, PAH, PCB and other chlorinated compounds, Glycols.

BIO-REMEDIATION BENEFITS:

- Thorough degradation in a relatively narrow time window.
- Toxin resistant and Reduced risk / higher degree of safety.
- Reduced labor and equipment costs.

BIO-SOLUBLIZER DEGRADER - use bio-based solvents to break down / detoxify contaminants to achieve remediation through either bio-stimulation or bio-augmentation.

BIO-AUGMENTER - microorganisms with sp. catabolic abilities to speed up degradation of TPH.

BIO-STIMULANT - naturally occurring material that provides ideal habitat enhancement for microbes, expediting bioremediation process.



WHY SPILLAWAY PRODUCTS...

- **About SpillAway:**
In operation since 1993.
- **Manufacturing Capacity**
40KL Liquid, 2MT Powder / day
- **Product range covers:**
Deep soil & water remediation. Off-shore bio-remedial cleaner. Special products for Oil Drilling. Absorbents for soil & water.
- Microbes used are in an active preparation, ready to be used.
- Requires no special mixing and no waiting period before application.
- Simple addition of water (salt or fresh) activates the products.
- Requires very little training of personnel.
- All these factors translate into cost savings for the user.

SPILLAWAY PRODUCTS

1. **HC Series** - bio-remediation of soil & ground water HC contamination.
2. **Remediact (Liq/Dry)** - A natural absorbent used for remediation of soils.
3. **OFM-500** - treat & clean crude oil and its by-products on hard surfaces.
4. **RigWash** - Off-Shore -Marine grade cleaner & degreaser for hard surface.
5. **Fleetklean** - driveway, concrete floors, metal grating, any solid surface.
6. **JackHammer** - softens, dissolves and removes Tar & Asphalt.
7. **PartsWasher** - aqueous product to clean & degrease parts.
8. **OWS-200** - Microbial-enzymatic agent for Oil Water Separator.
9. **SpillAway+** - commercial & industrial, food processing & packaging.
10. **Bio-W** - floating absorbent to control hydrocarbons floating on water.

TYCO CASE STUDY

- In June 2006, EarthTech (a member of Tyco) undertook bio-remedial clean-up of hydrocarbon contaminated site in Hungary.
- TPH levels were in excess of 300,000 mg/kg in parts.
- The project was completed in September 2006 as a complete success, in less than 120 days.
- On 28-Sep-06, TPH 4,045mg/kg, PAH 2.6 mg/kg.



Case Study
Tyco Earth Tech - Soil Bioremediation

Summary:
In June 2006, EarthTech (a member of the Tyco group of companies) undertook the bioremedial clean-up treatment of hydrocarbon contaminated muddy gravel at one of their sites in Hungary. The muddy gravel was contaminated with TPH levels in excess of 300,000 mg/kg in parts and was a stern test for the feasibility of bioremediation within the region.

The project was completed using SpillAway products and concluded in September 2006 as a complete success, in less than 120 days, including an initial 60 day test period during which some 50% of the total volume of contaminated soil was treated (the remaining volume being bioremediated within just 60 days).

Description of the treatment:
Task: Bioremediation of contaminated muddy gravel on site.
Contamination profile: Ex Situ contaminated muddy gravel test in a 4000 m² basin sealed with foil.
Volume to be treated: 4,000m³

Initial Soil Analysis (Day 1):

Sample No.	Sample Type	TPH (mg/kg)	PAHs (mg/kg)	Dry Matter %
6-1	Composite	310,000	1,106	44.8
6-2	Composite	291,000	708	47.8

Treatment procedure:
Step 1: Primary Test (60 days)
Initially, an area of 400m² was isolated within the project basin and contained by a gravel wall and 40m³ of contaminated muddy gravel was treated. This test area was filled up to a level of 20cm with water and a pre diluted mixture of Liquid Remedied™ and HC-300™ and increased oxygen circulation was achieved through aeration.

Monitoring began on day 30 after initial treatment and showed a great reduction in TPH levels.

Soil Analysis Day 36:

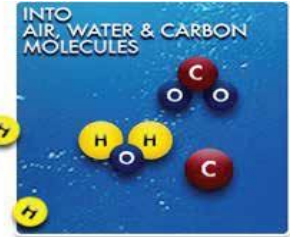
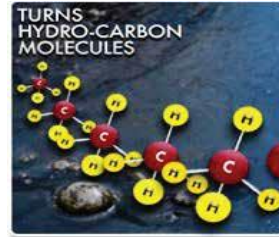
Sample No.	Sample Type	TPH (mg/kg)	PAHs (mg/kg)	Dry Matter %
6-3	Composite	4,045	6,800	86.250
6-4	Composite	13,300	14,200	86.8

DE-OIL-IT



THE WORDS'S SURVIVAL DEPENDS ON THE NATURAL CYCLE OF DECOMPOSITION

- Oil will not decompose naturally.
- HC molecules kill natural bacteria on contact, preventing the breakdown process needed for decomposition to occur.
- DE-OIL-IT has the unique ability to disarm these toxic molecules rendering them to be bio-available, Earth's natural bacteria then digests them safely.
- If indigenous microbial populations are not enough to degrade the contaminants, then we bio-augment by application of beneficial microbes.



Multiple use of DE-OIL-IT at various concentrations

- Rig wash – 4%.
- Well bore cleaner – 12%.
- Slick water surfactant – 12%.
- Water flood surfactant – 4%.
- Universal Cleaner/Degreaser – 1%.
- Coil tubing cleaner – 4%.
- Engine cleaner – 6%.
- Oil spill & driveway cleaner – 4%.
- Parts cleaner & shop cleaner – 1%.
- Flame out Fire Suppressor

