



## ESHHD – HYDROCARBON DEGRADER

**ESHHD** is a natural product formulated for use in hydrocarbon bioremediation of soil, sand, gravel, etc. It is environmentally safe and effective in cleaning up soils contaminated with petroleum hydrocarbons and other contaminants including gasoline, diesel, crude oil, benzene, toluene, ethyl benzene, and xylene, etc.

### **BENEFITS OF ESHHD:**

- Deep Cleans Soils
- Enhances Natural Processes
- Eliminates Unsightly Areas
- Reduces Pollution Liability
- Lowers Disposal Costs

### **TYPICAL REMEDIATION PROTOCOL:**

There is not a standard protocol for bio-remediating contaminated soils. There are however several guidelines which should be followed:

1. Till or rake the soil to optimize oxygen transfer
2. Apply **ESMS** Micronutrient Bio-Stimulant to oxidize the affected soil and stimulate indigenous microbes
3. Apply **ESHHD** Hydrocarbon Degradar and rake or till the soil at seven to ten day intervals or as required to ensure essential intimate contact between the microbial cultures and the contaminates
4. Application can be carried out with the aid any appropriate fertilizer or seed spreading equipment. Dry or wet application can be used.

\*\* The degradation process is directly affected by soil pH, nutrient levels, oxygen availability, soil type, environmental conditions (humidity, temperature, rainfall amounts), indigenous biomass, degree of contamination and the concentration of contaminates. Accordingly, application rates and intervals will vary from site to site. Repeated applications may be needed for heavily contaminated soil.

### **SEE PRODUCT LABEL FOR SPECIFIC APPLICATION PROTOCOLS**

### **TYPICAL APPLICATION RATES - INSITU BIOREMEDIATION:**

Spill Size	ESHHD-S Required	ESMS Required (diluted solution)
Small Spills	12 to 20 oz. (360 to 600 grams) / 100 sq.ft.	1 gallon (4 Litres) / 100 sq.ft.
Large Spills Up To 1 Foot Deep	100 to 125 lbs. (45 to 57 kgs.) / acre	400 galls. (1500 Litres) / acre
Large Spills Up To 1.5 Feet Deep	125 to 200 lbs. (57 to 90 kgs.) / acre	500 galls. (1900 Litres) / acre

\*\* In treatment environments with high biomass levels **ESHHD** application rates can be reduced.

**EXCAVATED SOIL:**

Typically the soil is placed in a lined containment cell in lifts of 8 to 12 inches deep. **ESHD-Hydrocarbon Degradar & ESMS-Micronutrient Bio Stimulant** application rates are the same as those for small spills.

**DIRECT INJECTION:**

This method is site specific and consultation with an Earth Smart technical representative or an experienced contractor is recommended.

**SPECIFICATIONS:**

**Form:** Free-flowing granular powder

**Color:** Beige

**Nutrient Content:** Biological nutrients & stimulants

**Plate Count:**  $5 \times 10^9$

**pH:** 6.5 – 7.5 (re-hydrated state)

**Bulk Density:** 0.6 - 0.8 gr. /cc

**Water Solubility:** Moderate - disperses in water

**Flash Point:** N/A

**Sensitive to static discharge:** Not sensitive

**Stability:** Max loss 1 log/yr

**SAFETY:**

**ESHD** is produced in accordance with NOSB (National Organic Standards Board) guidelines. The materials used in the production process are derived from naturally occurring and sustainable sources and are consistent with organic principals and the National List of Allowed Substances. **ESHD** does NOT contain synthetic chemicals, animal components, and animal by products, manure or manure by-products. **ESHD** is environmentally safe and is not harmful to animals, plants and humans.

**COMPLIANCE:**

Fully complies with EPA Toxic Substance Control Act (TSCA) and the rules, orders and regulations promulgated there under including:

- a) Sections 4, 5, 6 & 7; Title 40 Chapter 1, 707.20 thru 707.75;
- b) 40 CFR Sections 704.3, 710.2(e) and 720.3(c); and
- c) Sections 5 and 13, reference 42FR64583
- d) Does not contain marine pollutants as defined in 49 CFR 171.8.

**STORAGE & HANDLING:**

Store in a cool location away from direct sunlight - No special handling required

**PACKAGING:**

10 kg. (22 lb.) HDPE Pail - 250 gr. (8.8oz.) water soluble pouches

10 kg. (22 lb.) HDPE Pail - Bulk

110 lb. Fiber Drum - Bulk