



# OIL GATOR

## APPLICATION PROTOCOL (Full Version)

**OIL GATOR** is a chemically modified cellulosic fiber containing all the necessary ingredients (Nitrogen, Sulfur, and Phosphorous) to enhance biodegradation of hydrocarbons by indigenous bacteria. When activated by the addition of moisture, the indigenous bacteria have ideal conditions within which to reproduce and rapidly utilize the available hydrocarbon as a food source.

The strong wicking action of **OIL GATOR** acts as a physical emulsifier by actually extracting hydrocarbons from less absorptive material. It encapsulates the fine droplets making the hydrocarbons available to the bacteria as a food source.

Application of **OIL GATOR** is so simple it is difficult to understand how it works. **OIL GATOR** is simply applied by blending the dry absorbent with the contaminated soil as evenly as possible. Once the hydrocarbon comes in contact with **OIL GATOR** it is completely encapsulated (up to the saturation level) and cannot be extracted by naturally occurring contact with water. Even when wet, **OIL GATOR** will actually release water to absorb hydrocarbons. This extraordinary characteristic separates **OIL GATOR** from all other absorbents.

When furnished with ideal growth conditions, bacteria will multiply rapidly. Therefore, small quantities of bacteria will effectively perform the task of bioremediation if conditions are optimum. The most difficult job is to properly disperse the bacteria throughout the contaminated soil, and explain the elaborate procedure of washing and milling with most bacterial applications. Even after the hydrocarbon has been broken down into droplets, containment of the hydrocarbon is still a significant problem, often leading to leeching through the soil into ground water, contaminating fresh water supplies. This problem is non-existent with the application of **OIL GATOR**.

In remediation, no two situations are identical, which makes it difficult to formulate recipe type instructions for every application. However, a few standardized steps should be taken which will ensure better than average success. If you follow this procedure, you should achieve a minimum of 40% degradation every 30 days. Occasionally, in optimal conditions, we have achieved as much as an 80% reduction in 30 days.



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- (1) Ph of soil of liquid should be buffered to a ph level of not less than 4.5 and no higher than 9.5 for optimal conditions for bacterial growth.
- (2) Excessive levels of some heavy metals, PCP, fungicides, and pesticides will slow bacterial growth.
- (3) For liquid remediation, completely absorb with **OIL GATOR** until dry to touch.
- (4) Add water to completely saturate bed, almost to the point of flooding.
- (5) Frequent wetting is desirable so the bed does not stand saturated long.

For low soil contamination (below 40,000 ppm) we recommend effective tilling with a minimum of one bag (1.5 cubic ft.) of **OIL GATOR** per cubic yard of soil. Of course, you could use lesser amounts and still achieve satisfactory results but homogeneous blending to ensure maximum contact with the hydrocarbon, is more easily achieved with the use of ample amounts of **OIL GATOR**. You may want to dampen the soil during the tilling process to reduce dusting and to promote the migration of hydrocarbon particles into the absorbent.

Since liquids represent the highest level of hydrocarbons to be remediated, it may be necessary to add additional amounts of nutrients (Nitrogen and Phosphorous) if the rate of degradation levels out prior to completion. This is achieved by the addition of supplemental quantities of **OIL GATOR** to the bed followed by thorough tilling for oxygen replenishment and frequent watering.

After tilling is complete, thoroughly wet the area (to the point of flooding), especially if left uncovered. Retain a moisture level no less than 30%. No further aeration should be necessary for at least 60 days and only if degradation stalls.

Temperatures above 120°F for extended periods will slow the degradation process and temperatures below 40°F will slow bacterial growth. However, the absorbent will maintain its encapsulation characteristic, preventing hydrocarbon leaching until the bacteria are again active. **OIL GATOR** will not biodegrade itself until all absorbed hydrocarbons have been degraded.



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(7) For high levels of soil contamination (up to 450,000 ppm) we recommend an amount of **OIL GATOR** absorbent equal to one half the calculated amount of hydrocarbons to be remediated.

For example, an extreme case where the level of contamination is 450,000 ppm approximately 45% is hydrocarbon. To calculate the amount of absorbent needed (as a worst case scenario, where complete encapsulation is desired immediately) you would multiply  $0.45 \times 2700 \text{ lbs.} = 1215 \text{ lbs.}$  per cubic yard (the value of 2700 lbs. is an average estimate of the approximate weight of one cubic yard of soil). So, 1215 lbs. is approximately the amount of contamination per cubic yard of soil. Therefore, one-half of the total estimated weight of the contaminant is the amount of absorbent needed. In this case, 600 lbs. of **OIL GATOR** per cubic yard would provide the encapsulation necessary to contain the contaminant without leaching while providing enough nutrients to achieve maximum degradation with minimum aeration.

At 40,000 ppm the hydrocarbon content would be approximately 108lbs. per cubic yard and require approximately 50lbs. of absorbent for optimum performance.

We have found it very difficult in the field to judge hydrocarbon content without frequent testing and time-consuming procedures. With **OIL GATOR** this is not necessary, as visual observations are adequate in assuring proper application. Simply add absorbent to heavily concentrated areas until the soil is dry to the touch or takes on the appearance of normal soil in the area. If the soil still appears tacky after homogeneous blending, add more **OIL GATOR**.

After tilling is complete, wet the area completely and maintain at least a 30% moisture level throughout the remediation period. Frequent wetting is desirable as it helps migrate the hydrocarbons from the contaminated soil into the **OIL GATOR** where it is encapsulated and eventually degraded.

If degradation levels off (determined by TPH testing), simply till the soil thoroughly with more **OIL GATOR** and continue to keep damp with frequent watering.

