Bioremediation of oil contaminated soil

Background

Singapore has a significant oil and petrochemical industry with very large volumes of oil and petroleum derivatives being transported, handled and processed. It is inevitable that some of these materials are lost to the environment and are often stockpiled above ground. Whether on beaches or in storage areas, this can lead to soil contamination.

While bioremediation has been defined by the United States Environmental Protection Agency, USEPA includes bio-stimulation where naturally occurring microorganisms are fed supplements to enhance biodegradation rates, this Patent uses bioaugmentation instead.

Abstract

Bioaugmentation with microorganisms shortens the period required for biodegradation to achieve yields that are superior in terms of the types of target compounds being broken down as well as the time duration taken. Our product goes one step further in that we have data that compares the yields from different consortiums, as well as the actual classes of Total Petroleum Hydrocarbon that were being degraded.

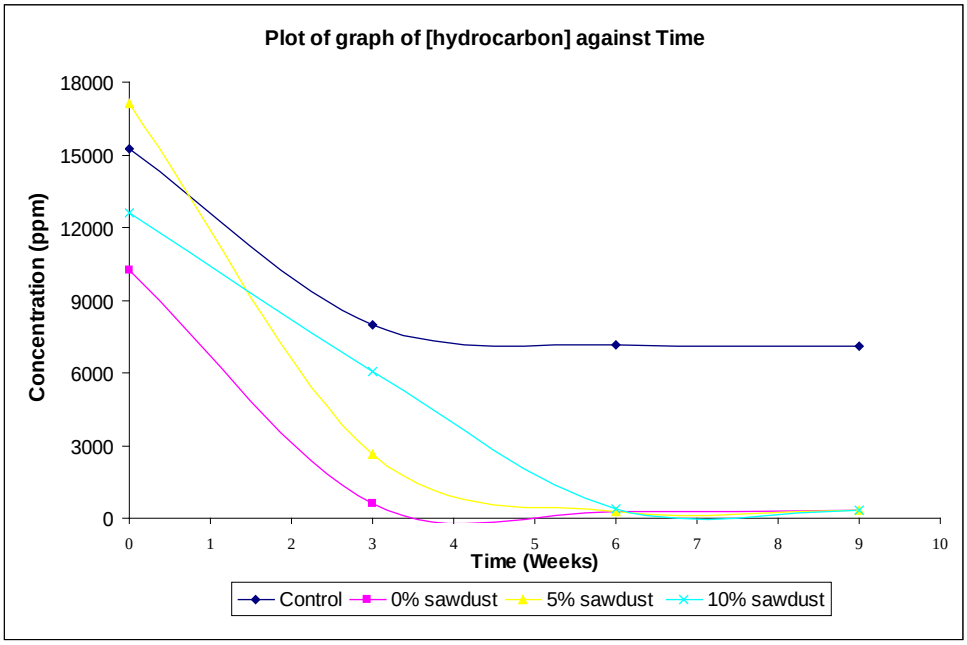

Fig 1: Biodegradation profiles of oil contaminated soil sourced from industry before, during and after biotreatment with our microbial consortiums.

Key Feature

- Targets recalcitrant aromatics and napthalenes component

Potential Application

- Bioremediation of oil contaminated soil

Patent

- 1 patent has been granted with patent no: 200702387 2 in Singapore

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Competitive Advantage

- Results were based on USEPA standard methods for TPH analysis on controlled experiments performed in the laboratory using samples obtained from the petrochemical industry at more than 15,000ppm.
- We have data that compares the yields from different consortiums, as well as the actual classes of Total Petroleum Hydrocarbon that were being degraded.
- Reliable and relatively rapid biodegradation of TPH can be obtained
- Translation and scale-up is practical and do-able
- We have also performed large scale (metric tons) field trials where samples with TPH that averaged more than 30,000ppm were bioremediated to less than 1000ppm with 9 weeks.
- The biotreatment process also regenerates the soil and fertilizes it naturally without the need for additional nitrates or phosphates.

Fig 2:
Photo of pilot trials for field work performed in Singapore

Commercialisation Opportunities

- Technology is ready to be commercialized in the market.
- Technology is available for licensing from Singapore Polytechnic.
- Interested companies are invited to submit their plans to Singapore Polytechnic Technology Transfer and Enterprise Centre (TTEC) for exploitation of the technology locally.

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