Remediation of Oil-Contaminated Soil in Greenland

This paper presents the recent research conducted at the Arctic Technology Centre, where different solutions for remediation of excavated oil-contaminated soil in Greenlandic towns were tested.

In the first work, soil polluted by light oil was treated with two different nutrient sources (substrate and N:P:K), stabilizer (crab shells) and heating (20°C). In this work a clear reduction in hydrocarbon content was observed during the treatment period of 730 days. No significant difference in degradation was observed between the two different nutrient sources, and no effect of crab shells was observed. The degradation proceeded further at the elevated temperature and even more when heat and nutrients were combined.

In the second work, a nutrient rich soil highly polluted by weathered heavy oil was aerated by insertion of air-channels, and heated to 20°C. Between 19% and 34% of the oil pollution was removed during the 81 days of the experiment. Analysis by Gas Chromatography-Flame Ionization Detector showed that the lighter fractions were removed, while the heavy oils remained. In the third experiment the oil contaminated soil is subjected to sequential treatment including adding of surplus heat from the local waste incineration plant. The results showed the highest reduction of the oil-contamination for the set-up with a combination of heat and sphagnum.

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