

Contributing to the cleanup of the Nakhodka heavy-oil spill

Bioremediation proven in Japan's largest-scale marine oil contamination — 1997



BioRangers

- Overview

Case overview

In January 1997, during Japan's largest-scale marine contamination caused by heavy oil spilled from the Russian tanker Nakhodka, the remediation effectiveness of our bioremediation was demonstrated.

Occurred January 1997	Contaminant Class-C heavy oil (over approx. 6 million L)
Remediation method Bioaugmentation (Terrazyme)	Outcome Heavy oil almost completely gone in about 10 weeks

- Background

The accident and the adoption of bioremediation

The Nakhodka broke apart in the Sea of Japan, and its bow section drifted ashore at Mikuni-cho, Fukui Prefecture. More than approximately 6 million L of Class-C heavy oil spilled, and because rough weather rendered both the oil-recovery vessels and the oil-treatment agents ineffective, the contamination spread across one metropolitan prefecture and five prefectures, becoming an accident of the worst scale. Immediately after the accident, at the request of Shibayama Port in Hyogo Prefecture, we took on microbial remediation — a method then almost unknown in Japan.

- Collaboration

Launch of the study group and collaboration

Together with experts from fisheries cooperatives, universities, fisheries experiment stations, insurance companies, oil companies and others, we established the "Nakhodka Marine Oil Contamination Bioremediation Study Group." In addition to the fishermen's labor-intensive oil recovery, we spread our biological agent "Terrazyme" onto the oil remaining in rock crevices and shallows.



- Field trial

Field trial and remediation results

"Terrazyme" is a community of natural microorganisms collected from nature, confirmed by safety testing to have no impact on marine life. When a comparative trial was conducted at the water's edge on heavy oil adhering to rock, the stone surface began to show within 3 weeks, and after about 10 weeks the heavy oil had almost completely disappeared, revealing the natural rock face.



Day 0: black heavy oil over the entire rock



After 3 weeks: the surface begins to show



After 10 weeks: the original color is restored

- [Significance](#)

Significance of the demonstration

Oil drifting on the sea surface can be recovered, but oil that has worked its way into rocky shores and sandy beaches is difficult to remove. This trial demonstrated that bioremediation is also effective against such "oil that cannot be removed by hand." The results were presented at academic conferences in Japan and abroad and compiled into a report titled "Marine Contamination Countermeasures Through Bioremediation."

- [Related materials](#)

Related materials

Study group report: "Marine Contamination Countermeasures Through Bioremediation"

Featured article: Nikkei Biotech No. 372 (published March 24, 1997)