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OIL SPILL EATER II EPA TEST – MARCH 1993 OIL SPILL EATER II – RESPIROCITY TEST - SUMMARY

This Respirocity Test was developed by NETAC and the Environmental Protection Agency to verify if a product could actually mitigate hydrocarbons to an end point of CO2 and water. The test was designed to measure the amount of oxygen-enhanced bacteria used. This would confirm the bacteria are in fact breaking the hydrocarbons down to CO2 and water.

At 100 parts Alaskan Gulf Seawater to 1 part OIL SPILL EATER II – applied at a 1 to 1 ratio to 1,000 parts per million Alaskan Prudhoe Bay Crude, the oxygen uptake is dramatic. This dramatic oxygen uptake proves a large amount of bacterial growth and decomposition of Prudhoe Bay Crude. The Chart on Page 2 shows an 86% decrease in heavy-end hydrocarbons and a 50% decrease in the aromatics. The test was stopped at 30 days; the test time prescribed by the EPA.

Our Standard Application Instructions for crude oil are 50 parts water to 1 part OIL SPILL EATER II applied at a 1 to 1 ratio to crude oil. The test results may be extrapolated to determine that with a 50 to 1 dilution, a 98% decrease in heavy-ends would occur in 24 days while an 85% decrease in aromatics would occur in 30 days. OIL SPILL EATER II can very effectively mitigate an oil spill.

After reviewing copies of the EPA Test on 10 other products, a comparison was initiated on the 2 products EPA claimed out-performed the other 9 products they tested. One product reduced the TPH approximately 158 parts per million and the other product reduced to 157 ppm of TPH. OIL SPILL EATER II reduced the TPH to 870 PPM. We feel this is a significant difference in efficacy.

March 1993 Respirocity Test

The Prudhoe Crude was supplied by the EPA, and was supposed to be the same crude used on the other two products. The crude sent to us for testing had a higher TPH (1,000 PPM) compared to the bacteria products tested by the EPA which only had a TPH of 168 ppm. Additionally, this crude did not have aromatics which the crude oil OSE II was tested on, did. The aromatics were reduced 50%.

It is our opinion that if you apply bacteria directly to a hydrocarbon with aromatics, that the toxicity of the aromatics will kill the bacteria. OIL SPILL EATER II first breaks the hydrocarbon walls, then grows bacteria so the toxicity is reduced first.

The accumulate oxygen uptake was also tested which shows bacterial activity. One of the products the EPA tested, they claim, performed well, had an uptake of 280 mg/L in 10 days and 460 mg/L in 30 days. The other product the EPA tested had 40 mg/L at 10 days and 440 mg/L at 30 days. OIL SPILL EATER II had an uptake of 520 mg/L at 10 days and 810 mg/L at 30 days. OSE II had more oxygen uptake at 10 days than the best bacterial products had at 30 days; on the 30 day comparison, OSE II had almost double the oxygen uptake any other product.

The EPA screened 31 products and tested 10. This test shows OIL SPILL EATER II reduced dramatically more TPH than these other products. OSE II produces more microbial activity than products with bacteria, and additionally, OSE II reduces aromatics. This test should help prove why we feel OSE II is the better product.

<u>NOTE:</u> In the summer of 2000 - Dr. Al Venosa (one of the EPA's top scientists at the time, on oil spills) reviewed this test. Dr. Venosa concluded that OSE II did, in fact biodegrade alkanes and aromatics. Dr. Venosa went on to explain that OSE II may be effective in degrading oil.

By: Steven R. Pedigo

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Chairman OSEI, Corp.

SRP/AJL

Chemical ***** Polymer ***** Design

Research and Development Consultation Legal and Expert Witness

July 3, 1990

Failure Analysis Formula Analysis Engineering Design

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Subject: Oil Spill Eater Respirocity Evaluation

CAI Lab. No. 3265

Dear Mr. Pedigo:

Chemical Analysis, Inc. being an independent third party laboratory was employed to evaluate an oil spill additive for respirocity efficacy. The oil spill additive submitted to the laboratory was a product identified as Oil Spill Eater batch No. 124-E. The additive was evaluated at two different concentrations which included 1/100 and 1/500, additive parts to solution parts, respectively.

The concentration of the oil was 1000 parts per million (ppm). The oil and seawater was submitted to the laboratory to be similar to field material.

The results of our evaluation are attached to the report. Observing the results, it can be seen that the additive has a meaningful and significant effect on decreasing the oil concentration and increasing the oxygen take up.

The effect on decreasing the aliphatic content of the oil was in the range of 80 percent and the decrease of the aromatic content was in the range of 40 percent. An additive concentration of 1/500 appears to be effective. The concentration of the additive may have an adequate effect at even a lower concentration than 1/500.

The inherent effect of oxygen takeup was observed to be 178 mg/L for the additive (1/500), 12 for the seawater, and 8 for the oil. The net effect of the additive was 512 mg/L.

If there are any questions or if we may be of further assistance, please advise.

Sincerely yours, CHEMICAL ANALYSIS, INC.

Galen Bartman Laboratory Director GWH:es

Oil Spill Eater (OSE) Respirocity Results

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	+	+	+	+	+	+	+	+	+	+	Seawater			Accumulate
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