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United Kingdom Toxicity Test with OSE II Summary

The United Kingdom Marine Management Organization, who's Marine Pollution Response Team, established the requirements to gain approval in the UK. This group required an efficacy test similar to the US EPA's efficacy test requirements to gain approval to the US NCP List. This group in the UK also required an Agitation Test, a Sea Test, and a Rocky Shore Test. The Agitation and Sea Test were to determine if OSE II was non toxic enough to be used on off shore, OSE II was tested with the species the brown shrimp (*Crangon crangon*), where OSE II proved it was non-toxic, and OSE II was approved for open waters in the UK.

A second test was performed on rocky shores to see if OSE II was nontoxic/safe enough to be used on UK shorelines. OSE II was utilized with *Patella vulgata*, and was shown to be nontoxic and safe therefore OSE II can be used on shorelines in the UK as well.

"3.2 There are 2 toxicity tests. The first test, the sea test, is carried out using the brown shrimp (*Crangon crangon*). This test compares the relative toxicity of an oil-product mix to that of the oil alone.

The second test is called the rocky shore test and is carried out using the common limpet (*Patella vulgata*). This test compares the toxicity of the product alone to that of the standard test oil."

OSE II is approved for use in the UK for open water and shorelines, once again proving to how safe and non-toxic OSE II is to marine species.

Steven Pedigo

CEO OSEI Corporation



Marine
Management
Organisation

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Approval for the use of oil spill treatment products in the sea under the provisions of the Marine and Coastal Access Act 2009

Approval reference number

Name and address of approval holder

Postcode

The Secretary of State for Environment, Food and Rural Affairs (referred to as "the licensing authority") in exercise of the power conferred by Section 15 of the Marine Licensing (Exempted Activities) Order 2011 approves the use of Oil Spill Eater II as a bioremediation product within United Kingdom controlled waters (other than waters adjacent to Scotland and Northern Ireland).

This approval shall remain in force for a period of 5 years from the date given below subject to the following conditions.

1. The product shall not be used except as stated at the time of application for approval, or in accordance with any subsequent instructions issued by the manufacturer or approval holder and approved by the licensing authority.
2. Only the product label provided by the approval holder and accepted by the licensing authority shall be used on supplies of the product marketed in the United Kingdom.
3. The approval holder shall not change the composition of the product, or the source of its raw material from that given in the application for approval without the prior notification to and the agreement of the licensing authority. If any change in any respect is made without the agreement of the licensing authority the product must be withdrawn from use. In such cases the agreement of the licensing authority must be obtained before the product is put back into use.
4. Any changes to the name and address details must also be brought to the attention of the Marine Management Organisation.

Signature


Date

Katherine Morton

Marine Pollution Response Team
Marine Management Organisation
for and on behalf of the licensing authority

Reference: Fresh Kuwait Crude 04/08/11 : 5.4ml per tank

Tank no.	no. dead	no. alive	no. in tank	%Mortality
5	4	16	20	20.0
7	7	13	20	35.0
10	4	16	20	20.0
Total	15	45	60	25.00

Chi-squared 1.600
d.f. 2
p-value for chi-squared test 0.449

Testing at 5% significance level,
Reference tanks are HOMOGENEOUS

! 3 tanks used

Test Treatment: Oil Spill Eater (557) : 5.4ml per tank
Bioremediation , 50 parts water to 1 part OSE

Tank no.	no. dead	no. alive	no. in tank	%Mortality
1	3	17	20	15.0
4	2	18	20	10.0
8	6	14	20	30.0
9	5	15	20	25.0
Total	16	64	80	20.00

Chi-squared 3.125
d.f. 3
p-value for chi-squared test 0.373

Testing at 5% significance level,
Treatment tanks are HOMOGENEOUS

! 4 tanks used

COMPARISON OF MORTALITY RATES

Reference %mortality 25.00
Treatment %mortality 20.00

D, Treatment %mortality - Reference %mortality **-5.00**

Standard error of **D** 7.16

95% Confidence interval for **D** -19.0 to 9.0

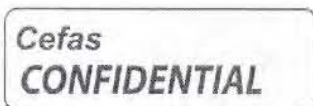
H0: treatment mort. = reference mort. , H1: treatment mort. > reference mort.

Test statistic -0.70 p-value = 0.758

Treatment mortality < reference mortality

Tanks where motors stopped have been removed from analysis

Notes: Tanks where motors stopped have been removed from analysis



Reference: Fresh Kuwait Crude : 18ml per 18L SW

Tank no.	no. dead	no. alive	no. in tank	%Mortality
2	2	18	20	10.0
5	6	14	20	30.0
7	5	15	20	25.0
9	0	20	20	0.0
13	5	15	20	25.0
Total	18	82	100	18.00

Chi-squared 8.537
d.f. 4
p-value for chi-squared test 0.074

Testing at 5% significance level,
Reference tanks are HOMOGENEOUS

Test Treatment: Oil Spill Eater (557) : 18ml per 18ml oil
Type 2 , 10% in sea water

Tank no.	no. dead	no. alive	no. in tank	%Mortality
4	4	16	20	20.0
6	1	19	20	5.0
10	0	20	20	0.0
12	2	18	20	10.0
14	0	20	20	0.0
Total	7	93	100	7.00

Chi-squared 8.602
d.f. 4
p-value for chi-squared test 0.072

Testing at 5% significance level,
Treatment tanks are HOMOGENEOUS

COMPARISON OF MORTALITY RATES

Reference %mortality 18.00
Treatment %mortality 7.00

D, Treatment %mortality - Reference %mortality -11.00

Standard error of **D** 4.61

95% Confidence interval for **D** -20.0 to -2.0

H0: treatment mort. = reference mort. , H1: treatment mort. > reference mort.

Test statistic -2.39 p-value = 0.991

Treatment mortality < reference mortality

Notes: Pass

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Reference: Fresh Kuwait Crude 04/08/11 : 16ml per plate

Tank no.	no. dead	no. alive	no. in tank	%Mortality
1	8	12	20	40.0
4	16	4	20	80.0
5	17	3	20	85.0
9	18	2	20	90.0
12	18	2	20	90.0
Total	77	23	100	77.00

Chi-squared 20.102
d.f. 4
p-value for chi-squared test 0.000

Testing at 5% significance level,
Reference tanks are NOT HOMOGENEOUS

Test Treatment: Oil spill eater (557) : 16ml per plate
Bioremediation , 10% in seawater

Tank no.	no. dead	no. alive	no. in tank	%Mortality
6	5	15	20	25.0
8	4	16	20	20.0
11	3	17	20	15.0
13	1	19	20	5.0
15	1	19	20	5.0
Total	14	86	100	14.00

Chi-squared 5.316
d.f. 4
p-value for chi-squared test 0.256

Testing at 5% significance level,
Treatment tanks are HOMOGENEOUS

COMPARISON OF MORTALITY RATES

Reference %mortality 77.00
Treatment %mortality 14.00

D, Treatment %mortality - Reference %mortality **-63.00**

Standard error of **D** 5.45

95% Confidence interval for **D** -73.7 to -52.3

H0: treatment mort. = reference mort. , H1: treatment mort. > reference mort.

Test statistic -11.55 p-value = 1.000

Treatment mortality < reference mortality

TEST INVALID: Reference tanks are not homogeneous

Notes: Reference tanks are not homogeneous, however the test treatment tanks are all lower mortality than the reference tanks. This will not be repeated, as it is a clear pass.

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