Ministry of Transport
TE MANATŪ WAKA

Maritime Transport Act 1994

MARINE PROTECTION RULES

Part 132 – Dispersants and Demulsifiers Amendment Rules 2009

Pursuant to sections 386, 387 and 388 of the Maritime Transport Act 1994
I, Steven Joyce, Minister of Transport, hereby make the following marine protection rules.

Signed at Wellington

this 27th day of June 2009

by STEVEN JOYCE

Minister of Transport

Contents

Part Objective

The objective of the *Part 132 – Dispersants and Demulsifiers Amendment Rules 2009* is to ensure that the nature of ecological toxicity testing undertaken and results submitted to Maritime NZ with requests for approval of new products are sensitive and representative of marine species in New Zealand. Additionally, the amendment aims to give clarity and direction to industry and organisations involved in ecological toxicity testing as to what the requirements are.

Extent of Consultation

On 08 March 2008, Maritime New Zealand published in each of the daily newspapers in the four main centres of New Zealand a notice inviting comments on the proposed marine protection rules. A notice was also published in the *Gazette* on 06 March 2008. The invitation to comment and draft rules were then made available to the public with electronic and hard copies being sent to 35 interested parties.

The parties consulted included representatives of the dispersant manufacturing industry, consultants potentially involved in dispersant testing and advice, international agencies with responsibility for approving dispersants and demulsifiers for use in their countries, NGOs, New Zealand government agencies and regional councils. Maritime New Zealand also made the draft available on its website. Comments on the draft rules were requested by 28 April 2008.

Two written submissions were received following the invitation to comment. All submissions were considered and the draft rules finalised.

1 Entry into force

These amendment rules come into force on the 30th of July 2009.

2 Rule 132.9 Dispersant specification

(1) Rule 132.9 is amended by substituting for sub-rule (1)(c) the following —

"(c) comply with the marine ecological toxicity testing standards using organisms relevant to the New Zealand environment, conducted in accordance with the specifications contained in the schedule of this Part by an accredited laboratory;

(2) Rule 132.9 is amended by substituting for sub-rule (2)(b) the following —

"(b) in the case of the marine ecological toxicity test:
(i) the tests used, including—
(aa) a full description of the test species and test methods; and
(bb) acclimation procedures; and
(cc) daily animal observations, feeding and medium changes; and
(dd) results and statistical analyses including control treatment survivorship; and
(ee) reference toxicant tests; and
(ii) details of the testing laboratory's accreditation."

3 Schedule: Minimum requirements for Ecological Toxicity Testing of Dispersants or Demulsifiers

Part 132 is amended by inserting the following schedule —

"Rule 132.9

Schedule Minimum requirements for Ecological Toxicity Testing of Dispersants or Demulsifiers

1. Test species

At least 2 different organism tests from the following list shall be tested:

Organism	Test type	Exposure	Common name	Scientific name	Organisms/ replicate
Amphipod	Survival	48-96h LC_{50}	Estuary amphipod	*Chaetocorophium lucasi*	10
Mysid shrimp	Survival	48-96h LC_{50}	Shrimp	*Tenagomysis novaezelandiae*	10
Mysid shrimp	Survival	48-96h LC_{50}	Brown Shrimp	*Crangon crangon*	10
Bivalve	D-hinge development	36-48h EC_{50}	Pacific oyster	*Crassostrea gigas*	1000
Bivalve	D-hinge	36-48h EC_{50}	Blue mussel	*Mytilus galloprovincialis*	1000

	development				
Echinoderm	Embryo development	36-48h LC_{50}	Sand dollar	*Fellaster zelandiae*	1000
Fish	Survival	48-96h LC_{50}	Sand flounder	*Rhombosolea plebeia*	10

NOTE: Consideration will be given to testing with other species on a case-by-case basis.

2. Testing protocols

(1) All testing to follow standard test protocols and include testing with a standard reference toxicant (e.g. zinc sulphate).

(2) All testing to include a minimum of:
   a. 4 dispersant concentrations and a clean seawater control
   b. 3 replicate tests for each test solution with test chambers and animals allocated randomly across treatments.

(3) Dispersant concentrations should be reported as nominal (added) values

(4) Measurements of DO, pH, temperature and salinity shall be taken at the test start, and then daily (24 hourly) or following renewal of test solutions or feeding of test organisms.

(5) Test conditions shall fall within the following parameters:
   a. all testing should be in full strength seawater (salinity ~34 ppt) unless otherwise specified by standard test protocols
   b. test temperatures should be within the range of 10-20 degrees centigrade.
   c. test organism biomass should not exceed 1 gram per litre in the test chamber.
   d. dissolved oxygen should not fall below 4 milligrams per litre in 24 hours.
   e. test chambers should be gently aerated to prevent stratification of test solutions.
   f. descriptions of the appearance of dispersant solutions recorded
   g. product identification should include formulation specification and lot/batch references

(6) The following test approaches are acceptable:

   a. Constant exposure testing where test organisms are placed in full strength test solutions for the entire test. The test solution may be renewed throughout the test (typically every 24 hours) and can be undertaken in a closed static chamber or a flow-through system where the test solution is circulated (but not diluted).

   b. Pulsed exposure testing where test organisms are placed in full strength test solutions in a closed static chamber for at least 2 hours, followed by transfer to clean seawater for the remainder of the test.

   c. Spiked exposure testing where test organisms are placed in full strength test solutions in flow-through chambers that are then slowly diluted with fresh seawater. The half-life of the test solution should be approximately 2 hours.

3. Approval criteria

(1) Survival in controls must be at least 90% or 80% for developmental bioassays (ie oyster, mussel, sand dollars).

(2) Test results will be measured against the Revised GESAMP rating scheme for acute aquatic toxicity (Table 1).

(3) To be approved for use in New Zealand dispersants and demulsifiers must be no more than slightly toxic.

Table1: Revised GESAMP Rating Scheme for Acute Aquatic Toxicity

Description	**LC_{50}, EC_{50} (mg/L)**
Non-toxic	> 1000
Practically non-toxic	>100 and ≤1000
Slightly toxic	>10 and ≤100
Moderately toxic	>1 and ≤10
Highly toxic	>0.1 and ≤1
Very highly toxic	>0.01 and ≤0.1
Extremely toxic	≤0.01

Abbreviations:
LC_{50} = Lethal Concentration causing a 50% response
EC_{50} = Effective Concentration causing a 50% response

Marine Protection Rules

PART 132 – DISPERSANTS AND DEMULSIFIERS AMENDMENT RULES 2009

Consultation Details

(This text does not form part of the rules contained in Part 132 – Dispersants and Demulsifiers Amendment Rules 2009*. It provides details of the consultation undertaken before making the rules.)*

Summary of Consultation

Prior to general circulation of the amendment detailed consultation on the development of the revised testing protocol was undertaken with two consultants in New Zealand with experience in ecotoxicological testing.

Copies of the proposed Part 132 Amendment were circulated to 35 organisations in March 2008 with an invitation to comment. The parties consulted included representatives of the dispersant manufacturing industry, consultants potentially involved in dispersant testing and advice, international agencies with responsibility for approving dispersants and demulsifiers for use in their countries, NGOs, New Zealand government agencies and regional councils.

One industry representative phoned for additional detail on how the proposed amendment would affect future approval of new and existing dispersant products but did not subsequently make a written submission. Two written submissions were received following the invitation to comment.

In his written submission Dr Mike Patrick of Resource and Environmental Management Limited noted his agreement with and support for the proposed amendments.

In their written submission, the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) noted that they have just completed a review of the dispersant testing procedures to be used in the United Kingdom. CEFAS also specifically noted:

- There are significant differences between the New Zealand and the UK approach, particularly with regards to the testing of dispersant alone by New Zealand, whereas the UK also test the toxicity of the dispersant against a standard oil type and in combination with oil.

- The UK approach only allows for two test species and they are concerned that the wider range of test species permitted by the New Zealand system will lead to applicants choosing a test species that provides the most favourable outcome for their product.

Maritime NZ Comment: The decision to test dispersant alone was deliberately taken after extensive consideration of the value of testing dispersant against and in combination with oil. The reasons for the dispersant only approach include:

a) *it is well documented that modern dispersant formulations are less toxic than oil to the majority of marine organisms. Our specific interest is therefore in the relative toxicity of the different dispersant products available;*

b) *oil types carried in New Zealand waters vary widely and the relative toxicity of a dispersant or dispersant/oil conjugate will depend almost entirely on the oil type used in the test; and*

c) *chemical dispersion of oil has the intentional effect of making the oil more bioavailable, thus accelerating the process of natural biodegradation. This effect also means that dispersed oil may well result in greater toxic impacts, particularly to water column species no matter what the dispersant type is. The potential for water column or benthic impacts is assumed in making decisions regarding dispersant application in a particular area depending on the priorities for protection. Testing the toxicity of oil/dispersant conjugates is therefore seen as being superfluous and would only impose additional and unnecessary costs on industry.*

The different sensitivities of the range of species we have identified as being acceptable for use in toxicity tests is taken account of in prescribing the test methodology and time of exposure for each species. Additionally, the test species and protocols selected are those recommended by NIWA as being sensitive and representative for New Zealand toxicity testing. In all cases the threshold toxicity values for approval of the dispersant or demulsifier products are considered very conservative, especially given the rapid dilution effects that will occur in the ocean following dispersant application. Any product that passes the set approval criteria for any of the species and tests prescribed will therefore be of very low toxicity.