



Summary of environmental risk assessment

Discharges from exhaust gas cleaning systems on ships

This information sheet summarises the key findings of an environmental risk assessment of scrubber discharges in New Zealand waters. The study was conducted in two phases between 2020 and 2021 by the National Institute of Water and Atmospheric Research (NIWA) on behalf of the Ministry for the Environment.

Context

Some large international ships use exhaust gas cleaning systems (scrubbers) to reduce the emissions of contaminants, including sulphur oxides, to the air. Scrubbers can create a washwater, ('open loop' systems) or in some cases a concentrated 'bleed off', ('closed loop' systems) which is then discharged to the marine environment. Some hybrid systems are also in use and can produce either type of discharge.

In 2020, NIWA began work on an environmental risk assessment of the risks posed by these discharges. The study conducted modelling for 11 New Zealand locations including ports/harbours and shipping lanes, two marine reserves and the Hauraki Gulf marine park.

The findings are published in two reports – a scoping study and literature review (phase 1) and an environmental risk assessment (phase 2) – on the Ministry for the Environment Website:

- [Risks from discharges from exhaust gas cleaning - scoping for environmental risk assessment \(phase 1\)](#)
- [Environmental risks from discharges from exhaust gas cleaning systems on ships in Aotearoa New Zealand \(phase 2\)](#).

Key findings of the scoping study and literature review (phase 1)

Phase 1 includes a comprehensive literature review identifying known environmental impacts of scrubber use, current gaps in knowledge, and offers possible approaches to assess the environmental impacts of scrubbers in New Zealand. This report:

- sets out options for a risk assessment framework to help assess whether intervention is required to manage scrubber discharges
- identifies that to date, few overseas studies have included assessment of risks, with most considering potential hazards instead. Several of these studies also concluded that more information, and further modelling, was required to assess risks - particularly in locations such as ports and estuaries.

Key findings of the risk assessment (phase 2)

Phase 2 is the final risk assessment report. It presents the methodology, including estimates for rate of emissions of contaminants in scrubber discharges, and predicted environmental concentrations. The report presents the results and provides recommendations on further work and options for managing scrubber discharges in New Zealand.

Key findings include:

- some uncertainties exist over the exact numbers of ships and scrubbers in use in New Zealand, as well as the quality of scrubber discharges across different ship types
- concentrations of copper and chromium from open loop scrubbers could exceed Australian and New Zealand (ANZG) marine water quality guidelines in Lyttelton, Tauranga, and Auckland ports, and the Akaroa cruise ship area
- other contaminants in scrubber discharges such as copper, nickel, mercury, zinc and phenanthrene have potential to accumulate in marine sediments, and could reach sediment quality guidelines in two ports, without considering the contribution of natural concentrations and/or existing sources
- scrubber washwater discharges do not pose any potential risks to marine life in shipping lanes but that there is potential for adverse effects in some ports, particularly those with low flushing rates and/or a greater volume of discharges due to the number and type of vessels.

The report also looks at relevant te ao Māori concepts and values relating to the marine environment and pollution, through a number of publicly available Iwi Environmental Management Plans linked to the 11 targeted locations. In addition to the work undertaken by NIWA, MfE has also approached iwi and Māori groups in regions where large vessels visit in order to build further understanding of interests, issues and concerns.

The report recommends that management considerations for scrubbers in New Zealand should focus on their use in ports and other areas with high numbers of large ships at berth for long durations (ie, close to 24 hours).

Visit the Ministry for the Environment website for more information on the [use of scrubbers under MARPOL Annex VI](#), and to read the Ministry's current [guidance for operating scrubbers in New Zealand waters](#).



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