

# Update report 2: modified reassessment of methyl bromide

APP203660

MAY 2021



Environmental  
Protection Authority  
Te Mana Rauhi Taiao

New Zealand Government

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## Executive Summary

Stakeholders in Methyl Bromide Reduction Incorporated (“STIMBR”) applied for the reassessment of methyl bromide under section 63 of the Hazardous Substances and New Organisms Act (“the Act”, or “the HSNO Act”).

The hearing was held virtually between Tuesday 11 August 2020 and Monday 17 August 2020, where the Decision-making Committee (DMC) heard evidence from the applicant, the Environmental Protection Authority (EPA), submitters, and the various expert witnesses called by all parties.

Following the adjournment of the hearing, the DMC requested additional modelling to assist with their deliberations. The applicant, as part of their feedback to that modelling, provided further modelling as well. The applicant’s additional modelling (Golder, 2021) sought to refine several input parameters for selected scenarios so a 100 m buffer zone for log stacks could be achieved.

As part of a review of the Golder 2021 modelling, Todoroski Air Services (TAS) identified an error in the modelling information which resulted in an underestimation of the methyl bromide released. This error originated in TAS’s 2020 modelling report which the Golder 2021 modelling relies on, and effects scenarios where recapture occurs for less than 100% of log stacks which are fumigated. In noting this error, TAS and Atmospheric Science Global (ASG) identified that a correction factor of 2.43 could be applied to the Golder outputs to give an accurate output.

In the Direction and Minute WGT035, the DMC acknowledged the error and correction factor and requested that the EPA provide an update report which provided the figures in tables 3-6 of the Golder 2021 report, scaled down by the correction factor of 2.43.

This report provides the requested recalculations. No further analysis has been undertaken in the report by the EPA.

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## 1 Background

- 1.1 Methyl bromide is used as a fumigant to treat a number of products prior to their export to selected countries, and for quarantine applications in imported goods, collectively known as quarantine and pre-shipment (QPS) uses. It is also permitted to be used for the quarantine treatment of potato wart in New Zealand.
- 1.2 It was approved under the Act on 29 October 2004, via the Hazardous Substances (Fumigants) Transfer Notice 2004, and has the Hazardous Substances and New Organisms (“HSNO”) Approval Number HSR001635.
- 1.3 Methyl bromide was previously reassessed in 2010 following an application by the Chief Executive of the Environmental Risk Management Authority (“ERMA”, the EPA’s predecessor). The 2010 DMC decision included controls relating to buffer zones, and the need to recapture methyl bromide (down to 5 parts per million, ppm) by October 2020.
- 1.4 STIMBR applied for grounds to reassess methyl bromide in 2017 (APP203435). Evidence was provided of a 50% increase in the use of methyl bromide between 2010 and 2016, along with reviews of recapture progress. These grounds were granted by a DMC on 5 April 2018.
- 1.5 STIMBR subsequently applied for a reassessment of methyl bromide (that is, this application, APP203660), which was formally received on 9 April 2019. They requested that the approval be changed to “clarify the current controls, specifically those relating to the performance target of recapture technology and feasibility of the controls” relating to recapture to:
  - reduce the recapture target requirement to 80% of methyl bromide remaining at the end of fumigations
  - extend the deadline by ten years for achieving recapture from ship hold fumigations
  - make refinements to strengthen buffer zone requirements at the completion of the recapture.
- 1.6 The Chief Executive of the EPA considered the content of the application and decided to use the EPA’s discretionary power in section 63A(1) of the Act to proceed with the application as a modified reassessment.
- 1.7 The Chief Executive decided to not use the EPA’s discretionary power in section 63A(4) of the Act to process the application without public notification. The application was, therefore, publicly notified in accordance with section 53 of the Act.
- 1.8 A hearing into this reassessment commenced on Tuesday 11 August 2020. After hearing evidence from the applicant, the EPA, submitters, and the nominated expert witnesses of several parties, the Decision-making Committee (DMC) adjourned the hearing on Monday 17 August 2020.

## 2 Purpose of this report

- 2.1 During the course of the application, several air dispersion models have either been provided to or commissioned by the EPA and the DMC.
- 2.2 These models can be used to predict how far methyl bromide could travel if the assumptions in the models are correct, which can then be used to set protective buffer zones.
- 2.3 The EPA used several modelling reports and their specialist expert reviews to form the basis of our buffer zone recommendations presented at the hearing.
- 2.4 Following the adjournment of the hearing, the DMC directed that additional modelling be conducted to assist them with their deliberations – in Directions and Minute WGT023 and WGT024.
- 2.5 As part of their feedback on this additional modelling, the applicant provided two further air dispersion modelling reports. One of these reports (Golder 2021) seeks to make refinements on the TAS 2020 modelling in order to generate maximum parameters within which a buffer zone of 100m can be achieved.
- 2.6 It was noted in the review of this refinement modelling by TAS and by ASG that there was an error in the figures presented by Golder. This error, as acknowledged by TAS, stems from a previously undetected error in the modelling TAS undertook and which Golder's refinements were based. In their review TAS and ASG indicate that this can be corrected by scaling the modelling by a factor of 2.43.
- 2.7 Upon being made aware of the error and the correction factor, the DMC directed the EPA to present corrected figures for the relevant log stack and maximum doses presented by Golder, that is divide the values in Tables 3 to 6 of the Golder report by the 2.43 correction factor.
- 2.8 The purpose of this report is to present these corrected tables.
- 2.9 It is worth noting that although the models discussed are specific to the practices and environs at the Port of Tauranga, the modelling experts have previously agreed that they could be used qualitatively at the two other ports where methyl bromide fumigation of logs currently takes place. Should there be future fumigation activities at these ports, or any other location, then the requirements in the Health and Safety at Work (Hazardous Substances) Regulations would still apply. Regional Councils could also set larger buffer zones than any minimum buffer zone set in this application as part of their resource consenting process.

### 3 Revision of Golder's (2021) outputs

#### Stack size

- 3.1 As Golder (2021) proposed in their modelling report, one option to ensuring that a 100 m buffer zone can be met is to limit the size of the log stacks.
- 3.2 Golder presented their calculated maximum log stack sizes in their Tables 3 and 4. These sizes are updated in the tables below to correct the values by the correction factor of 2.43, as noted above.

**Table 1 Maximum volume of logs stacks fumigated (in m<sup>3</sup>) for ventilation between 7am - 9am and 3pm - 7pm (corrects Golder's Table 3)**

Dose rate (g/m <sup>3</sup> )	Maximum volume of log stacks (m <sup>3</sup> ) for 30% recapture rate			Maximum volume of log stacks (m <sup>3</sup> ) for 50% recapture		
	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured
40	2,700	3,100	3,400	3,200	3,900	4,700
72	1,500	1,700	1,800	1,700	2,200	2,600
120	900	1,000	1,100	1,000	1,300	1,500

Note: all volumes have been rounded down to nearest 100 m<sup>3</sup>

**Table 2 Maximum volume of logs stacks fumigated (m<sup>3</sup>) for ventilation between 9am - 3pm (corrects Golder's Table 4)**

Dose rate (g/m <sup>3</sup> )	Maximum volume of log stacks (m <sup>3</sup> ) for 30% recapture rate			Maximum volume of log stacks (m <sup>3</sup> ) for 50% recapture		
	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured
40	4,400	4,900	5,300	5,000	6,200	7,400
72	2,400	2,700	2,900	2,700	3,400	4,100
120	1,400	1,600	1,700	1,600	2,000	2,400

Note: all volumes have been rounded down to nearest 100 m<sup>3</sup>

- 3.3 As noted in the EPA's Update Report (EPA, 2021), the reporting requirement controls would need to include records of log stack dimensions and volume so that any such maximum stack size control can be monitored for compliance.

## Maximum dose

- 3.4 As noted by Golder (2021), an alternative to setting an emission rate limit or maximum log stack size would be to set a maximum dosing rate.
- 3.5 Golder (2021) provided the dosing rates required, in their Tables 5 and 6 such that their proposed 100m buffer zone would be met.
- 3.6 As with the Log Stack Volume results these are effected by the error carried forward from the TAS modelling. The same 2.43 correction factor is applied in the tables below.

**Table 3 Maximum MB dose for ventilation between 7am-9am and 3pm-7pm (corrects Golder’s Table 5)**

	30% Recapture rate			50% Recapture rate		
	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured
Maximum dose (kg)	113	126	137	128	160	190

**Table 4 Maximum MB dose for ventilation between 9am - 3pm (corrects Table 6)**

	30% Recapture rate			50% Recapture rate		
	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured	50% stacks recaptured	80% stacks recaptured	99% stacks recaptured
Maximum dose (kg)	177	198	214	201	251	299

- 3.7 As noted in the EPA’s Update Report (EPA, 2021), the reporting requirements would need to include records of the dosage rates so that any such control can be monitored for compliance.
- 3.8 However, compliance, monitoring, and enforcement (CME) agencies may find it difficult to measure this dosage rate independently of an operator. This might present difficulties for such agencies to monitor compliance with this control, and consequently to enforce it.

## Appendix A Acronyms

**Table 5 Acronyms**

Acronym	Meaning
ASG	Atmospheric Science Global
CME	Compliance, monitoring and enforcement
DMC	Decision-making Committee
EPA	Environmental Protection Authority
ERMA	Environmental Risk Management Authority
g/m <sup>3</sup>	Gram per cubic metre
HSNO	Hazardous Substances and New Organisms [Act 1996]
kg	Kilogram
m <sup>3</sup>	Cubic metre
QPS	Quarantine and pre-shipment
STIMBR	Stakeholders in Methyl Bromide Reduction Incorporated
TAS	Todoroski Air Sciences Proprietary Limited

## Appendix B Reports relied upon in this report

There are a number of standalone reports that have been used in preparing this report. Instead of including all of these as appendices to the report, please find a links to these reports in Table 6.

**Table 6 Reports relied upon**

Author (in alphabetical order)	Date	Title	Link
Atmospheric Science Global	2021	Review of Golder Associates NZ Ltd Fumigation Mitigation Options Investigation at the Port of Tauranga, Mount Maunganui Area (TMMA).	<a href="https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/ASG-Review-of-Golder-Fumigation-Mitigation-Options-Invetiatiion-6-May2021.pdf">https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/ASG-Review-of-Golder-Fumigation-Mitigation-Options-Invetiatiion-6-May2021.pdf</a>
Golder Associates (NZ)	2021	Fumigation Mitigation Options Investigation	<a href="https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/WGT029response09.2_25th-Memorandum-of-Counsel-for-the-Applicant-29.1.21-Attachment-2-Golder-Report.pdf">https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/WGT029response09.2_25th-Memorandum-of-Counsel-for-the-Applicant-29.1.21-Attachment-2-Golder-Report.pdf</a>
Todoroski Air Sciences	2020	Air dispersion modelling of methyl bromide for decision-making committee	<a href="https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/APP203660_TASs-2020-air-dispersion-modelling.pdf">https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/APP203660_TASs-2020-air-dispersion-modelling.pdf</a>
Todoroski Air Sciences	2021	Review Of Golder Air Dispersion Modelling Of Methyl Bromide For Decision Making Committee New Zealand Environmental Protection Authority on behalf of Decision-Making Committee	<a href="https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/Todoroski-Air-Sciences-2021-Review-of-Golder-2021-modelling.pdf">https://www.epa.govt.nz/assets/File/API/hsno-ar/APP203660/Todoroski-Air-Sciences-2021-Review-of-Golder-2021-modelling.pdf</a>

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