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Lee Bailey
Senior Adviser, Hazardous Substances Reassessments
Environmental Protection Authority,
Te Mana Rauhi Taiao
Via email: [redacted]

RE: Review of Update Report 2 – Modified reassessment of methyl bromide APP203660

Dear Lee,
Thank you for your invitation to respond to Direction & Minute WGT035 of the Decision-making Committee (DMC) dated 17 May 2021.

The key aspect of the DMC direction that relates to Todoroski Air Sciences (TAS) is as follows:

11. *To understand the log stack sizes required to meet the 100 m buffer zone proposed in the Golder report, the DMC direct the EPA to provide an update report providing versions of Golder's Tables 3 to 6 divided by this factor of 2.43.*

12. *The DMC also direct that this updated report be independently reviewed by the same experts that reviewed the TAS 2020 and Golder 2021 modelling. The purpose of this review is to provide feedback on the revised calculations only, and is not an opportunity to provide further information.*

Review of Update Report 2, Modified reassessment of methyl bromide APP203660
The EPA has scaled down the values in tables 3, 4, 5 and 6 of the Golder report by a factor of 2.43 and has rounded down the volume results (Golder tables 3 and 4) to the nearest 100m^3. EPA table 1 corresponds with Golder table 3 etc.

TAS has checked the EPA's calculations by factoring up the EPA values by 2.43 for comparison with the original Golder report values, (and also, as outlined below, by factoring down the Golder report values by 2.43 for comparison with the EPA values).

The EPA values, if scaled back up by 2.43, result in values similar to but lower than those in the Golder report. Noting that the Golder report states that it already rounded the values down to the nearest 100m^3, it may be more exact to consider rounding, (and not rounding down) the scaled Golder results.

TAS thus also scaled down the Golder results by a factor of 2.43 and rounded them to the nearest 100m^3 for Tables 3 and 4) for comparison with the EPA values.

The following volumes, shown in **bold red** in the reproduced EPA tables 1 and 2, are up 98m^3 lower than the scaled down Golder report values in Golder tables 3 and 4. This is due to rounding down the scaled down Golder values.

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

Dose rate (g/m^3)	Maximum volume of log stacks (m^3) for 30% recapture rate			Maximum volume of log stacks (m^3) 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**

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

Dose rate (g/m^3)	Maximum volume of log stacks (m^3) for 30% recapture rate			Maximum volume of log stacks (m^3) 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**

The results in EPA tables 3 and 4 are very close to the Golder values in Golder tables 5 and 6, and any effects that may arise from rounding or rounding down are negligible.

Conclusion

Assuming that Golder has rounded down its values to the nearest 100m^3 it may be more exact to scale the Golder results down by 2.43 and then simply round the result, rather than round down the result to the nearest 100m^3.

In our opinion, the effect of rounding vs. rounding down the scaled down Golder result is small and would be within 10% for the smaller volumes and approximately 2.5% for the larger volumes.

Thus, the EPA tabled values can be accepted as reasonable and valid as they are. Alternatively, the values shown in red bold above could be increased by 100m^3.

The former is the more conservative, but still a reasonable action that one would expect a regulator to take. The latter may be more exact, but it assumes that Golder has rounded down its values, and it is not

straightforward to determine if this is the case in the available time, or necessarily important to do so. This is because either way, there is relatively little difference, and any variability is within the modelling accuracy.

Overall, we consider that the EPA calculated values are suitably reliable for regulation of methyl bromide emissions.

Please feel free to contact us if you would like to clarify any aspect of this review.

Yours faithfully,
Todoroski Air Sciences

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