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14 January 2021

Re. Direction & Minute WGT028 - following the release of the updated Todoroski Air Sciences (TAS) modelling report

The Bay of Plenty Regional Council (Council) submits further comments under the following headings for consideration:

1. TAS Report
2. Atmospheric Science Global (ASG) Review
3. STEL (Short term exposure limit)
4. Additional Recapture Trial Information – what recapture level is appropriate?
5. Definition of Recapture
6. Recapture Timeframe
7. Port Worker Exposure

1. TAS Report

The modelling scenarios are presented in table 3-2 of the TAS report with the associated required buffer distances to meet the 1 hour TEL (tolerable exposure limit) presented in table 4-1.

The following scenarios stand out:

Scenario 3	Ship, no recapture	buffer required 1020m
Scenario 13.a	1 log row, 30% recapture	buffer required 125m
Scenario 13.b	1 log row, no recapture	buffer required 175m
Scenario 15	6 log rows, no recapture	buffer required 700m

* treatment rates and fraction of log stacks that recapture is applied to vary

These buffer distances are significantly larger than what is currently required (notwithstanding the under prediction identified by ASG mentioned below). These also raise issues regarding exposure levels of Port workers who are often very much closer to fumigation than the general public and exposed for longer periods.

Given the difficulties associated with monitoring methyl bromide, and the fact that in New Zealand methyl bromide does not contain an odouring agent as is often the case elsewhere, the buffer distances are one of the main means by which excessive exposure is prevented so must be established on a precautionary basis.

Low wind speeds

TAS commented in the summary that “low wind speeds are more likely to result in the greatest impacts”. This reinforces the point we have made in our main submission that fumigation should not be permitted during low wind speeds.

Non simultaneous ventilation of logs and ships.

The TAS report states that “the operator advises that log and ship ventilation would not occur concurrently.” This may generally be the case however it has occurred in the past so if buffer distances are based on this assumption then regulations must be put in place prohibiting any overlap of ship and log ventilation.

Ship emissions

The TAS report states that “emissions of methyl bromide from ship holds were modelled over a 13-hour period and it was assumed that one hold is opened every two hours.”

Regional Council has previously documented (and provided information to the EPA) on a fumigation event of an entire ship of five tonnes of fumigant vented over two hours. Regulations must be introduced limiting the rate at which fumigant can be released to that which is deemed to be safe outside the buffer distance - if ship fumigation is to be permitted at all.

2. Atmospheric Science Global (ASG) review

ASG's peer review concludes that “the TAS model is under predicting the methyl bromide concentrations by at least 20-50% for each ship hold and for log piles, especially in the near field <300m which reduces to around 10% out to 2km”.

The buffer distances presented by TAS therefore need to be increased accordingly.

3. STEL (short term exposure limit)

A significant limitation of the TAS assessment is that it is entirely focussed on the buffer distance required to meet the TEL, a one hour average level of methyl bromide, yet health effects can result from exposure during much less than one hour.

As previously submitted a STEL is necessary to protect both the public and Port workers.

Jenny Barclay (ASG) in her review of 'Genera Air Assessment for Fumigant Release at the Port of Tauranga' dated December 2019 stated that “it is recommended that all the fumigants that Genera is applying for should be assessed using ... STELs ...”. This was not done.

4. Additional Recapture Trial Information – what recapture level is appropriate?

Direction and Minute WGT002, dated November 2019 reads in part as follows:

- c. Pursuant to s58 HSNO Act, the DMC requests Genera Ltd provides the following information to it, by 3 December 2019:
 - i. The Golder Report;
 - ii. Recapture technology report, and the follow up recapture trial report;

https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP203660/APP203660_Direction-and-minute-WGT002-20191128.pdf)

The follow-up recapture trial report entitled “Recapture Report July 2020” referred to in this Direction and Minute WGT002 was apparently not available at the time it was requested however it has since been provided to the Bay of Plenty Regional Council.

This Genera recapture report presents the results of a recapture trial carried out in operational conditions for five different log stacks. Three of the five stacks achieved recapture equal to or in excess of 80%. The other two stacks achieved 43.7% and 59.5% respectively. It is likely Genera would be willing to provide the report if it was requested again by the DMC.

Main factors influencing recapture rate

It is clear from the Genera trials that the recapture percentage achieved is largely determined by the following factors, all of which are under the control of either the fumigator or the Port:

- a) Size of the log stack
- b) Time for which recapture is carried out
- c) Freshness of recapture solution used

This shows that an 80% recapture figure is both realistic and achievable now.

It is important to note that even with an 80% recapture rate there is still between 3497 ppm and 6489 ppm methyl bromide released to atmosphere at the end of fumigation, based on the above Genera report. A 30% recapture figure, as is now proposed by industry obviously results in even greater concentrations of gas being released.

The above figures of 3497 ppm and 6489 ppm are obviously far in excess of the 5ppm, the current limit on the concentration of methyl bromide able to be released under the current EPA definition of recapture.

Based on trial results, and submissions made by Genera to the plan process, the Bay of Plenty Regional Natural Resources Plan has recently defined recapture using the equivalent of 80% reduction in methyl bromide.

Other sources of recapture information

Knowing the level of recapture that can be readily achieved is clearly vital when it comes to establishing an appropriate definition of recapture. To assist with this we informed EPA staff of a comprehensive MPI (Ministry for Primary Industries) trial into methyl bromide recapture carried out last year. It is important that this MPI trial information also form part of the DMC’s deliberations.

5. Definition of Recapture

As previously submitted, recapture must be defined as the remaining concentration (i.e. parts per million) in order for it to be readily measured. This way it is clear to both the operator and to the regulator if the required level of recapture is achieved. Without the definition expressed as a concentration recapture levels will not be able to be verified and so the risk to nearby workers and the public may be greater than expected. This is particularly the case if the buffer distances are reduced on the basis of a particular level of recapture being achieved.

6. Recapture Timeframe

At the last review of methyl bromide (2010 / 2011) a 10 year time horizon was applied for requiring recapture. Despite this the only meaningful recapture of any type that occurred during this 10 year period occurred in the Bay of Plenty where Council resource consent conditions required its incremental introduction.

It would be nice to avoid a repeat of that situation, and instead have the EPA establish an ambitious and meaningful timeframe for the introduction of recapture, with a requirement for continuous incremental improvement as technology develops.

Milestones need to be set requiring improvements in recapture efficiency and the percentage of fumigations to which recapture is applied.

Ships

It is difficult to see how the fumigation of ships can continue if the final buffer distances established by the EPA are in line with independent recommendations (i.e. in some cases more than 1000m) and the fact that there is no legal means to exclude the boating public from further than 50m from ships.

7. Port Worker Exposure

Staff working on a Port where fumigation occurs will generally have far greater exposure to fumigants than the general public. They are typically in closer proximity to fumigation and for much longer periods.

Despite this the only methyl bromide standard that applies to them allows for exposure up to five times the concentration of the general public. In addition, this Port worker standard is an average exposure over 8 hours so does little to protect against periods of high concentration of gas over a short period e.g. (<15 mins).

We therefore reiterate the point made in our main submission that additional protection from fumigation is required for Port workers.