TRANSCRIPT OF PROCEEDINGS

ENVIRONMENTAL PROTECTION AUTHORITY HEARING

APP203660 - METHYL BROMIDE
Hazardous Substances Reassessment

VIRTUAL HEARING
on 17 August 2020

DECISION-MAKING COMMITTEE:
Mr Tipene Wilson (Chair)
Dr Ngaire Phillips
Dr Derek Belton

Hearing Proceedings

Day 05 Monday 17 August 2020

Time	Name	Representing	Topic	Documents Submitted / Presented	Transcript Ref. Page no's
8.31 am	Chair		Introduction		386
8.43 am	Philip Taylor (via email)	Port Blakely Ltd	Representation	Submission	389
8.48 am	Gary Jones	New Zealand Apples and Pears	Representation	Submission	391
9.02 am	Danielle Adsett	New Zealand Apples and Pears	Representation	Submission	395
9.10 am	Dr Rachel Kilmister	New Zealand Apples and Pears	Representation	Submission	398
9.18 am	DMC		Questions		400
9.23 am	EPA		Questions		403
9.26 am	Submitters		Questions		403
9.35 am	Kevin Bartolo	EIM Research Pty Ltd	Representation	Submission	407
9.59 am	DMC		Questions		413
10.13 am	Submitters		Questions		417
10.23 am			Morning tea		419
10.41 am	Dr Jack Armstrong	STIMBR	Applicant's response to matters raised		420

10.48 am	Dr David Fletcher	STIMBR	Applicant's response to matters raised		422
10.52 am	DMC		Questions		423
10.53 am	David Sullivan	STIMBR	Applicant's response to matters raised		423
11.37 am	DMC		Questions		437
11.42 am	Morgan Slyfield	STIMBR	Applicant's response to matters raised		438
12.20 pm	DMC		Questions		449
12.31 pm	Julian Jackson	EPA	Closing Karakia		452
12.34 pm			Adjourn		453

[8.31 am]

INTRODUCTION

CHAIR: Kia ora tātou. Mōrena. Happy Monday to all. For those of you that haven't met us before, my name is Tipene Wilson. I am the Chair of the Decision-making Committee. To my right …

DR PHILLIPS: Ngaire Phillips, another member of the DMC.

CHAIR: And to my left …

DR BELTON: Derek Belton, the third member of the DMC.

CHAIR: So, on to the housekeeping matters for the day. We are here to hear the evidence for and decide on application APP203660 to reassess methyl bromide. We acknowledge that the hearing is being heard virtually. Unfortunately it was not possible, due to scheduling conflicts, for the DMC to convene the hearing in person until mid to late September, albeit that we are together in person today. Therefore, in the interests of time the hearing was convened with the DMC in attendance virtually. Submitters will or should have received links to participate via Zoom videoconferencing and others can observe the hearing by following the links in the hearing pages on the EPA website.

The hearing is specifically to address this application. The HSNO Act does not permit the Committee to make decisions about other substances that are currently approved or going through their own application process as part of this process, nor is it the Committee's role to assess methyl bromide recapture technologies. The Committee shall consider and decide any application other than an application which is the subject of a ministerial direction under section 68 of the HSNO Act and shall have in relation to any such consideration and decision on any matter the same immunities and privileges as are possessed by a District Court judge. The object of the hearing is for the Decision-making Committee to be as informed as possible on the matter on which we are charged with making a decision.

The way the proceedings have run is we have heard firstly from the applicant, who introduced the application, then from the EPA staff who presented the staff report and then from submitters who have indicated they wished to be heard. Today, after the submitters, the Committee will have final questions and then the applicant will have the right of reply, at which stage the hearing will be adjourned for deliberation by the Committee.

The DMC has read all the information provided from the applicant and submitters and because it is the last opportunity I'll have to say it, that

was 6,100 pages. Parties have been asked to pre-circulate any additional information they intend to produce at the hearing. It does not need to be read verbatim. Parties should highlight key matters of the information and we will be restraining excessive repetition or matters we consider irrelevant to the application we are hearing.

I note again that the role of the Committee is not to determine the actual or claimed efficacy of alternatives to methyl bromide or alternative methyl bromide recapture technologies. Because the Committee has read the comprehensive information provided, they may have few or no questions for submitters.

[8.35 am]

On to the matter of questions. At the end of each person's presentation, I will invite questions of the presenter from the DMC, EPA staff, the applicant, submitters and any witnesses. Questions will be of clarification or explanation only. I will decline to have questions put that stray too far into cross-examination, aren't relevant to the matter we are considering or if the questioner starts providing a statement or submission. As I flagged on Friday, following the right of reply from the applicant, it will only be the DMC who asks any questions of the right of reply. Please speak clearly when asking or answering questions for audio recording purposes. It would be helpful for the audio record and for the Committee if persons putting the question forward could identify themselves.

On to the housekeeping items. We have had a health and safety briefing for this venue and hopefully you are keeping yourselves safe wherever you may be.

In terms of media, the hearing is being made public via remote access technology except to the extent that we need to protect any sensitive information, and representatives of the media are, of course, free to attend and report the proceedings. Applications for recording can be made to the DMC in advance by writing to the EPA. However, please note that because the hearing will be conducted via Zoom, it will be available online to the public and recorded both audiovisually and transcribed. Those of you that have no life, like me, would have found the transcription very helpful reading over the weekend. So transcripts of the hearing will be available the next day and will be located in the hearing section of the methyl bromide consultation page. For completeness and context, please provide your presentation to Marree Quinn so that it can be uploaded in the same place.

The DMC are not available for media interviews. The EPA will be available to provide process information to the media. All media enquiries should be directed via media@epa.govt.nz.

We will now go to introductions. I've got a slightly different setup here in that I can't see anybody on the screen. So we'll go to EPA staff and then to the applicant and then free for all in terms of introducing yourself and where you're from. Kia ora.

MR BAILEY: Kia ora. I'm Lee Bailey e hoa. I'm a senior advisor in our reassessments team and I'm the application project lead for the EPA. In the room with me I have …

MR DEEBLE: Kia ora. I'm Ben Deeble. I'm a reassessments advisor at the EPA and I've also been in this project team.

MR BAILEY: Also with us in the room in Wellington is Milana Blakemore, who is the team leader for the reassessment. Elsewhere in the building here we have Matt Allen and Dan Phipps. Matt is a senior advisor and Dan is an advisor of the reassessment team and they'll be working with the Committee following their deliberations to write the decision document on their behalf. Elsewhere online we have Gayle Holmes, who is a general manager in the compliance monitoring and enforcement group at the EPA, Julian Jackson who is a senior advisor in our Kaupapa Kura Taiao team and also Philippa McKenzie who is a senior solicitor at the EPA.

CHAIR: Thank you. Mr Slyfield?

MR SLYFIELD: Kia ora. My name is Morgan Slyfield. I'm legal counsel for STIMBR and with me on the line at the moment are Ian Gear and Don Hammond, who've both given evidence to this hearing for STIMBR, and my co-counsel Duncan Bellinger and also Dr Armstrong. There may be others from STIMBR's team joining us throughout the course of the proceedings.

MR GLASSEY: Kia ora. It feels like it's a small family that we've had together for a week. Ken Glassey, senior advisor for the Ministry for Primary Industries and have been involved with running the MPI approved treatment programme for close to 20 years, a member of the methyl bromide technical options committee and also co-author of the IPPC reduce and replace methyl bromide.

[8.40 am]

MS DIJKSTRA: Mōrena koutou. Ko Stephanie Dijkstra (Māori content - will be inserted when script finalised) and I'm member of the Ngāi Tahu HSNO Komiti. Kia ora.

SPEAKER: (several inaudible words)

MS GIBSON: Kia ora tātou. It's Philippa Gibson from WorkSafe from the technical programmes and support and health and technical services team who are running the WorkSafe methyl bromide project.

CHAIR: Thank you, was there anyone else that wanted to introduce themselves?

MS SMITH: Good morning, my name is Nicole Smith, I am a member of the Tauranga Moana Fumigant Action Group.

CHAIR: Kia ora tātou. On to the business of the day. We have had the submitters that were on the sequence of submitters appearing today change at the request of one of the submitters who subsequently, due to the Covid-19 restrictions, had been unable to make the flight. So he has provided something via email which I will read. That is Mr Taylor from Port Blakely Limited. I will read that shortly.

Then we will go to NZ Apple and Pear, EIM Research, a brief morning tea and then on to right of reply from the applicant.

So reading from - and this will be posted, by the way, on the website - the email that Ms Quinn received this morning. In summary the key messages that Mr Taylor would like to leave with the Committee are as follows.

SUBMISSION 127576 - PORT BLAKELY LTD

PHILIP TAYLOR PRESENTING (VIA EMAIL)

"As a small forest owner operator our of secondary ports, Port Blakely are very reliant on fumigation using methyl bromide at the Ports of Tauranga and North Port. These two ports are a critically important part of our supply. Port Blakely operate out of the Port of Dunedin and Ports of Timaru and don't have the scale to be able to justify alternative treatments to methyl bromide, such as debarking, at these locations.

Notwithstanding the above, a suggestion that debarking replace fumigation, this is not an acceptable phytosanitary treatment for India. India is a very important market for New Zealand and we cannot simply ignore the risks of effectively closing down this market by limiting the option to use methyl bromide. The only acceptable phytosanitary treatment currently approved for importing logs into India.

India is and will become a more important market for New Zealand, especially as markets such as Korea and Japan, which have either alternative phytosanitary treatments to methyl bromide or in a country treatment reduced their log imports from New Zealand. This reduction has been a decade long trend and it is likely to continue.

Without the option to export logs to India, Korea and Japan, this volume will need to be redirected to China, resulting in oversupply and high risk market concentration. New Zealand is already overexposed to the China export log market. Domestic consumption for logs is a preferred option but the unfortunate reality is that there is unlikely to be a net increase in domestic demand of any scale for many years. As the Committee is aware, it is the importing countries that set phytosanitary requirements on logs exported from New Zealand.

[8.45 am]

The only replacement fumigant to methyl bromide that has been identified as EDN and this still under application for registration. Assuming EDN is registered, it will take some time to work through receiving country approvals and local resource consent requirements. Until this is done, we need to be able to continue using methyl bromide as part of our supply chain.

A number of submitters have suggested that in receiving country fumigation is an option, such as Canadian logs imported into China. Not only is this questionable from a moral perspective, it also leaves New Zealand exporters very vulnerable to changing attitude to in country fumigation.

Finally, the coalition government is on record saying publicly that it is the primary sector, including forestry that will be key to New Zealand's post-Covid recovery. At a time when New Zealand desperately needs to general overseas earnings, there is an opportunity to support this by facilitating the continuation with the appropriate controls use of methyl bromide. The alternative is to maintain the current ruling and effectively ban the use of methyl bromide with the resultant impacts on the ability of the forestry sector to support our economic recovery."

Once again he apologises for the late notice of non-attendance. He then notes if the Committee is of a mind to ask questions, he is more than happy to receive them either by email or by VC or phone contact. I think for expedience we will provide any questions to Mr Taylor by email. So they go on record now I will just turn to my colleagues for questions and then open up to submitters. But what I would suggest, rather than ask the questions online is if you then go into the chatroom and type the questions for all to see or directly to Marree Quinn so that they can put in an email to Mr Taylor. Dr Belton?

DR BELTON: Thanks, Chair. No questions from me.

CHAIR: Dr Phillips.

DR PHILLIPS: No questions from me either.

CHAIR: And no questions from me. If EPA staff, applicant and any other submitters, if you have any questions, could you please put them in the chatroom for Ms Quinn to pass on to Mr Taylor.

Thank you for that. We are now a little bit ahead of time. I wonder NZ Apple and Pears is ready to go? Kia ora.

SUBMISSION 127555 - NEW ZEALAND APPLE AND PEARS

GARY JONES PRESENTING

MS ADSETT: Kia ora. We will just share our screen if that is okay with you?

CHAIR: Yes, thank you.

MS ADSETT: Over to you, Mr Jones.

MR JONES: Good morning, thank you for allowing us the opportunity to present to you today. My name is Gary Jones, I'm the Trade Strategy and Policy Manager at New Zealand Apple and Pears and I'll just do a short introduction around what our industry is and how methyl bromide fits into its exports and philosophy. Then will be followed by Danielle Adsett, our Market Access Manager, and she will talk about the more technical side of where methyl bromide fits and then Dr Rachel Kilmister will finish off with some discussion around our R&D processes around alternatives, etc.

In the first instance, we support the use of methyl bromide with 80 per cent recapture to maintain critically a market access to one particular market, which is the market of Japan. It is a key strategic market for us and it is very important one for particular organism and it is required of us under Japanese law, which we would certainly like to get changed but of course these things are quite challenging and time-consuming.

[8.50 am]

The 80 per cent recapture we believe can maintain our market access and we are negotiating and working on alternatives. We will go into that in a little bit more detail later.

New Zealand Apple and Pears is the industry organisation that oversees market access for the entire apple industry and we have undertaken a large amount of R&D in market access, including alternatives to methyl bromide and a system to support our Japan trade strategy.

A very quick understanding of the industry. It is a modest size really, 2,000 hectares, 257 growers now only, just under 1,000 orchards and we are producing 600,000 tonnes of fruit, of which we export two-thirds, just over 400,000 this year. Now, to give you an understanding of the context of that in size, 600,000 tonnes of apples, if you place them side by side, would go around the equator of the earth 6.7 times. Globally it is a significant industry and certainly maintains a lot of employment in New Zealand.

I think it is important to understand the role of New Zealand Apple and Pears so I have one other point. Not only is our industry around producing apples, we also own arguably the world's best apple and pear breeding programme and we are charged with commercialising new varieties and new genetics globally with a number of partners. We have 257 growers, we have 1,500 growers globally growing our intellectual property. They produce an additional 200,000 tonnes of produce and our strategic goals as an industry are to grow that significantly over the next few years and certainly Japan is a key area where we are likely to employ that.

The slide you see at the moment, the data on the left is published each year by the World Apple Report, it is a Washington State University professor that does this. He retired in 2018 so for the four years 2015 to 2018 we have been rated the most competitive apple industry in the world and we have no doubt we would have continued on that trajectory had he continued to publish.

On the right-hand table you will see we are the most productive industry in the world at 61 metric tonnes. We are 50 per cent more productive than the next cluster around 40, and we always will be. There's competitive advantages. New Zealand is the goldilocks environment for producing apples and pears, it is not too hot and it's not too cold. We have an oceanic climate and our competitors generally grow in climates where it gets too cold in spring and too hot in summer. We are very competitive in terms of our ability to compete.

I would challenge -- I'm not sure if there's another industry in New Zealand that's growing at the same rate we are, not at 3.5 compound annual average growth in area since 2012. It relates to a 12.5 per cent growth in value over those eight years. We're on track to continue that trajectory. That's really a function of our breeding programme around the new varieties which are much more high value, a strong market access programme which allows us to out-compete our competitors in terms of accessing very difficult markets and I think accessing the right consumers in those markets as well.

A little bit more noisier slide. The key which I want to demonstrate here is our philosophy around how we produce fruit and that methyl

bromide is an anomaly in our production systems. On the left-hand side you'll see since 1995 this chart, a multi-coloured chart, describes toxicity indices for the products that we would apply to our apples and pears. We had a very significant change in approach back in the 1990s, really being pushed out of Europe and a requirement with de-registration of pesticides and a requirement from the consumer, filtered through the retailers, that we weren't able to continue on a trajectory of using some of these old chemistries.

[8.55 am]

Interestingly, at that time there was a coalition of 21 EGOs. They got together and petitioned retailers to not stock product which had high residues or residues that they deemed to be inappropriate. They shamed a whole lot of retailers at that point and there was a change in approach in which the European supermarkets and retailers drive a significant shift in the way produce can be produced for them. New Zealand led from that moment on really in terms of changing its systems and processes to much softer chemistries. That table shows the trajectory we have got to now, where we're using (inaudible) products and outturns and outcomes for Europe and those proprietary measures and requirements is probably the best outcomes we've seen in any produce industry the world is combining.

On the flipside of that, we're also able to meet the very, very tough market access requirements of Asia. There's a bit of a paradox there, where we're essentially treating up for British and Europe, which has had very low pesticide inputs and very low pesticide outcomes, or they're not detectable, where in Asia we're providing fruit into the toughest market access markets that have very tough requirements on quarantine pests and we're outperforming in those particular areas as well.

On the right-hand table is the pesticide residues on apple, a table which we dragged out of a Washington State Apple Industry publication. It's an EPA or USDA set of work that was done there and it was part of the dietary index, analysis of apples in the US done by Washington State University, looking at toxicity indices. To give you an understanding of the outcomes from our programme now, when that was done, comparing Chile and the US and New Zealand apples, we were found to be significantly better than our competitors there. The US had a toxicity index 19 times higher than New Zealand's and the Chileans was 28 times. The EP found the highest risk was on Chilean apples, while New Zealand apples had very few residues and posed only a slightly higher risk than organic apples. The risk for organic fruit is 50 to 200-fold lower than the risks associated with conventional fruit.

Again, I suppose the point I'd make here is EBR is an anomaly and we're only after what is very specific and it's very targeted and I'll go into why it is important to us. It's only used for one of key markets, which is Japan, as I've mentioned earlier, but Japan is an extremely strong growth market. Here you'll see it's right at the bottom on the table on the left. It's number 15 in volume at the moment, but it's around about number 9 or 10 at the moment in terms of value. What you're seeing at the moment if you look at the right-hand table, it's number 1 in terms of per unit value at almost twice what the next best is in China.

What we're doing in Japan is we're disrupting their apple market. Japan normally produces apples for gifts. They are packaged as individual fruit and they are used for gifts. They're peeled and segmented when you're visiting someone and they will be consumed at the end of the meal in a particular way. We have accessed a much younger group of consumers in Japan and they are eating apples for health and eating them daily. We certainly want to continue the opportunity to grow that market and we see it as probably our biggest opportunity.

I draw to the importance of the market and the importance of maintaining it. At the moment, we have got some projections. You can look at our projections there. I think in our submission we were looking at $100 million in 2023, up to $200 million by 2030. The changes in the market have surprised us in our ability to penetrate that market and disrupt it and we're seeing growth probably at a higher trajectory than we actually originally may have put into our submission.

[9.00 am]

I would see that we're sitting around about the $46 million now and there's real potential for us to significantly increase that. If we do, then there'll be pressure on increasing productivity here and also of course the jobs and prosperity for regions which comes from the increased growth within this industry. Of course it is important, we believe, at the moment we maintain as much growth in exporting as we can.

We have one other competitor in Japan at the moment and that's the US, who put up a very modest amount of fruit and really aren't performing particularly strongly against us. You can see there where our average kilo return at FOB is 6.34 and they're sitting just on $2. We have the right variety mix and the right product for Japan with the first move advantage now additionally, which has given us wind in our sails is the CPTPP trade agreement, of which the US isn't it. We are currently sitting in that little table at the bottom there, in 2020 we've been at 10.2 per cent, originally at 17 per cent before the signing of that agreement, moving to 8.9, as I said, next year. That's adding more and

more, I suppose, profit or return and value back to New Zealand and of course we can see that continue to erode away as we move through. So a market that has a huge amount of potential for us over the next few years.

So I'd just like to conclude at that point my introduction and I think we probably can just continue with our presentation to give you full context and I'll hand over to my colleague, Danielle Adsett.

MS ADSETT: My name is Danielle. I'm the Market Access Manager for New Zealand Apples and Pears. So for New Zealand to export apples to Japan, the fruit must undergo methyl bromide for the key quarantine pest, codling moth. Codling moth damage occurs when the larvae chew through into the fruit through to the seed, as shown on the right-hand side. When left unchecked, damage can be severe and destroy most of the crop, but because our codling moth is a quarantine pest of many of our major markets, such as China, Japan, Taiwan, a lot of research and development has gone into the control of the pest.

As a result we have a significant systems approach programme, which concentrates on selecting low-risk blocks, monitoring through the season, threshold sprays with soft targeted chemistry, strict assessments both on the orchard and through the packhouse. Because of this strict process there has been no interceptions of codling moth into Taiwan, which is one of our strictest markets, since 2013 and only three intercepts since 2008, so that's three finds and more than 50 million fruit assessments in Taiwan, so giving us a 99.99 per cent pass rate.

For access to Japan, blocks are registered with MPI and growers and packhouses and cool stores must adhere to the Japan Official Assurance Programme. This means that fruit is treated with a systems approach through the orchard and packing, similar to what happens in China and Taiwan. However, the key difference is that for access for Japan, methyl bromide is applied as an end point treatment. As Gary said, methyl bromide is a mandatory treatment for Japan, as per the Japanese Plant Protection Law in 1950, which mandates quarantine treatment and has zero tolerance for pests such as codling moth.

Japan has a significant apple industry, so it's compelled to protect its industry. This is in the same way that New Zealand wants to protect herself from incursions of fruit fly and brown marmorated stink bug. However, we are confident and we have the data to prove that the systems approach will provide the same level of control. The quarantine treatment that has been approved through our government to government assurance is 24 g per cubic metre of methyl bromide at 12˚C for two hours in a sealed chamber, followed by cold treatment at

2˚C for 25 days and then an additional 5 per cent inspection post-treatment.

Research has shown that recapture at 80 per cent in these purpose-built chambers is possible. However, recapture at 5 ppm would take days, not hours, and result in the fruit being fundamentally destroyed, or for lack of a better term, cooked. Recapture at 5 ppm therefore would not be an option for the apple industry.

[9.05 am]

Japan apples, once they undergo the methyl bromide treatment, are held segregated from the apples destined for other markets. They're packed into cartons with insect-proof packaging and then they are re-inspected on arrival into Japan. All treatment sites in the apple industry are purpose-built, fully enclosed rooms and are approved for use by Genera and the IVA and then the fumigations are operated by Genera.

Methyl bromide use on apples is at half the loading that is used in other industries and equates to less than a per cent of the total methyl bromide use in New Zealand. We treat approximately 4 per cent of our total crop annually. This is because we've got limited fumigation sites and there is generally a bottleneck as product needs to be stored for 25 days post-treatment. Therefore, volumes to Japan without methyl bromide treatment would be significantly increased.

We also have a Japan MAF auditor that comes out once a year to audit the treatment sites, and this is on top of our IVA audits, to ensure compliance to the programme.

Detection of codling moth on arrival in Japan would result in the entire shipment being destroyed, an investigation by MPI in New Zealand for the reasons codling moth is present, and export to Japan for the New Zealand industry stopped until the corrective actions are agreed between Japan MAF and New Zealand MPI. This is not something that we take lightly.

New Zealand apples have access to 65-plus countries and Japan is the only market that requires mandatory fumigation but, most importantly, New Zealand is the only country in the world with significant access to Japan for apples. We have managed to negotiate for all of our other markets that deem codling moth as a quarantine pest to accept the systems approach as an alternative. Fumigation is against our industry's fundamental philosophies regarding sustainable outcomes and environmental stewardship, and this has been our key driver in work that has gone into promoting the systems approach with the Japanese and the R&D into the alternative treatments.

We need to be able to implement an 80 per cent recapture of methyl bromide in order to bide our time until we have an alternative option approved by Japan MAF. Trials completed over the last two seasons show that it's possible to recapture 80 per cent of methyl bromide without damage to the quality of apples. This will be an imperative interim step in New Zealand retaining its access to Japan for apples. However, it's not the final step for us. We will continue to push for access using the systems approach.

The proposal was presented to MAF by MPI in 2019 and MPI continues to use its forum to raise it with their counterparts on a regular basis. However, we know that the Japanese are a culture that are highly structured, traditional, patient and polite, so we are working with MPI/MFAT to build our New Zealand brand and trust in our product. There were plans in 2020 to take a delegation from New Zealand to Japan and that group would have included New Zealand Apples and Pears as the industry body, MPI, MFAT, Plant and Food Research, lecturers from Massey University and our exporters to continue to develop this relationship, and this is obviously a plan that we will implement in a post-Covid world.

In parallel, we are also investing in our R&D programme to demonstrate that systems approach equivalency to the end point methyl bromide treatment, which Rachel will discuss in more detail through her slides.

So, what will it mean if we cannot implement an 80 per cent recapture of methyl bromide treatment for apples to Japan? Effectively, it will be a loss of market access. It is imperative to understand that in this world of exporting apples a loss of supply to the market will have significant flow-on in the years to come. If we're not able to supply Japan with the fruit that they need in 2021, we would see a negative impact on those volumes, even if the systems approach was accepted the following year. This is because of the significant loss of relationship between the exporters and their customers, a loss of trust for supply, a loss of consumer awareness of branding around our IP such as Rocket or Envy, and a loss, even if temporary, of access to Japan will have long-lasting implications on the opportunities that this market provides. As an aside, we'd have to find a home for around 7,000 tonnes of fruit as well at half the value.

I probably should have put on the slide "when", not "if". When Japan accepts the systems approach, this will be the absolute best-case scenario for New Zealand apple growers. It will result in methyl bromide not being used for access. It will open up market access to more exporters and, therefore, increase returns back to many more growers. It will support additional growth and, therefore, regional

wellbeing in our communities, and we have no doubt the 200 million market potential may just be a drop in the water.

[9.10 am]

If given the choice, methyl bromide would not be used in our industry. However, to reiterate, we need to bide our time by utilising the 80 per cent recapture to retain market access and our relationships with the Japanese to reach our main goal of implementing a systems approach for market access to all of our markets.

I will now pass over to Dr Rachel Kilmister.

DR KILMISTER: Okay, thanks, Danielle. As Danielle said, my name is Rachel Kilmister and I look after the R&D portfolio for New Zealand Apples and Pears.

So, with New Zealand Apples and Pears, we have a pretty extensive R&D programme and it's primarily focused on supporting market access. This is primarily focused on finding sustainable solutions that meet strict residue requirements in Europe but while also meeting stringent phytosanitary requirements of Asian countries. These are generally countries that have a zero tolerance for the pest of concern. Just to make it clear that we're not actually growing the fruit low residue for one market or just for low pest tolerance in another market. Our fruit is made available for all markets, so we're meeting both of those requirements for all the fruit that we grow.

So, the New Zealand apple industry are world leaders in our approach to integrated fruit production and that's our focus on using soft chemistry, biological control, and searching for new tools that can be applied in a sustainable way. Earlier, you saw Gary describe our change from the use of toxic chemistry to soft chemistry and biological control, and this change has been underpinned by research and development to manage an integrated pest management programme and establish our systems approach that's resulted in low residue fruit.

Since then, our R&D programme has focused on expanding access into Asia. This has been underpinned by a seven-year R&D programme that's funded in partnership between New Zealand Apples and Pears and MBIE. Under this programme, we are developing new tools for improved phytosanitary access into Asia with a primary focus on our two pests of concern for Japan that are codling moth and apple leaf curling midge.

So, this programme has a strong focus on finding sustainable nil residue orchard and post-harvest controls. Some of these examples are the development of lure and kill, mating disruption and sterile insect

technology in the orchard, and then for the pack house looking at things like new generation apple washers and hot water treatment.

Since 2010, Apples and Pears have also been looking for solutions to replace methyl bromide as an end-point treatment. This has also been a component of the Apples Futures II partnership programme and on an annual basis since 2010 we've been spending approximately 12 per cent of our annual R&D budget on finding an alternate end-point treatment to replace methyl bromide.

So, our search for alternative end-point treatment for methyl bromide has been pretty exhaustive. We've tried all sorts of options that included controlled atmosphere and heat treatments, various chemical fumigants such as phosphine and ethyl formate, and most recently irradiation, which is currently not an option for us to use in New Zealand. For all of these treatments they've proven ineffective for achieving 99.99 per cent efficacy that's required for acceptance of an end-point treatment or, as you can see on the right there, the damage to the fruit has made it unsaleable. We're continuing to search for options but they're becoming really stretchy at this point. We're considering options like cold plasma treatment that really is still just in the developmental stage.

It's important to note that none of these solutions are going to provide a short-term solution. Even if we found something that was suitable, we'd be looking at a long time then negotiating access into Japan with that treatment.

So, our primary focus is on improving and demonstrating the efficacy of our systems approach, and this is by layering new orchard and post-harvest controls so we continually push our system to reduce the pest profile. We're also working to demonstrate how effective it is by developing an export risk assessment model, and with this model we're looking to see if we can use that data and information to further negotiate market access for codling moths.

Then, not to be forgotten, we've also been conducting trials to determine what level of methyl bromide we can recapture that is commercially feasible using a closed fumigation system that we use for our export of apples to Japan.

[9.15 am]

So, we've done recapture trials over the past two export seasons. Prior to 2019, the recapture capability wasn't available so we couldn't test it prior to then. That first year we did recapture was a trial on process-grade apples in bins using a Japan export fumigation protocol and, having no idea what to expect, we found that 80 per cent recapture

was likely feasible in a commercially appropriate timeframe. However, what we found is that reaching 5 ppm recapture is likely to take days, if possible at all. We were seeing a concentration of methyl bromide starting to plateau at around about 250 ppm.

In 2020, just the season probably May just gone, we repeated the trial but this time we did it on commercial cartons of apples that were destined for Japan. We found again that the apples were export suitable following 80 per cent recapture, and we reached 80 per cent recapture 75 minutes post-treatment. For 95 per cent recapture it took around about 150 minutes. So, for a normal venting time for this particular export system that we trialled the recapture on, it's around 60 minutes of venting. So the 95 per cent, extending that to 150 minutes, is extending the apple exposure to methyl bromide well beyond a normal timeframe and that can significantly increase the potential of fruit damage.

So, in this system that we recaptured it might be possible to achieve 95 per cent recapture with testing over a season or two, but it's not yet been tested on other varieties or fumigation set-ups that are used by other exporters. So we're currently not certain of whether the impact on quality or the engineering and time to recapture in other systems will be suitable. Therefore, we are requesting that 80 per cent recapture is implemented for a closed fumigation system.

So, just to summarise what our key points are to wrap up our presentation, New Zealand Apples and Pears is supporting 80 per cent recapture of methyl bromide for a closed system and this is to allow our industry to keep market access to Japan open, which is an extremely important market for growth and value. It is our intent that the use of methyl bromide will only be needed until we can remove it as a requirement by Japanese law. The acceptance of a systems approach by Japan will take time to negotiate but once it's successful it will allow our industry to lift its growth potential free of an end point treatment.

So that summarises and concludes our presentation. So I'll hand it back to the EPA panel there.

CHAIR: Thank you for your submission. Dr Phillips?

QUESTIONS

DR PHILLIPS: Thank you very much for your submission. I just wanted to clarify - it's just really for you, Dr Kilmister - the last section there. So, you mentioned about your concern about the 95 per cent that -- to get 95 per cent recapture you've got exposure of 150 minutes and then there is 60 minutes venting on top of that. Is that correct?

DR KILMISTER: Sorry, just to clarify. Normally after the venting process there is 60 minutes. The recapture would take 60 minutes but then it takes 150 minutes in total. It's taking longer but the fruit then has to sit in that chamber.

DR PHILLIPS: So it's 150 minutes for recapture and venting?

DR KILMISTER: Yes.

DR PHILLIPS: Okay, all right.

DR KILMISTER: Actually it's just being recaptured at that point.

DR PHILLIPS: Okay, all right. And the 250 ppm, was that regardless of -- is that at the 95 per cent recapture or is that at the 80 per cent recapture or both?

DR KILMISTER: That's at the 95 per cent recapture. So 80 per cent of the -- I'll just quickly look at my notes here. The 80 per cent recapture is probably around about 4 grams per cubic metre and then the 95 takes it down to about just over 1 gram per cubic metre.

[9.20 am]

DR PHILLIPS: Okay, just writing that down. So you said this was a set-up in Japan. Is that right?

DR KILMISTER: No, this in Hawke's Bay. So we have currently got three or four different fumigation facilities based in Hawke's Bay with different exporters.

DR PHILLIPS: Okay. And are you using a range of different technologies or do you just have one provider of the technology? Sorry, I'm focusing on the recapture here.

DR KILMISTER: Genera is the supplier of the recapture actually for all of our exporters.

DR PHILLIPS: Okay. And are you considering looking at other options for the recapture component?

DR KILMISTER: We're reliant on what is available in New Zealand. As far as I know, that's the only one that is available for us to use.

DR PHILLIPS: Okay. Thank you for that. Just getting back to -- actually I think this was perhaps Ms Adsett, the timing of the -- so you're obviously actively working with Japan to try and convince them - I don't know if that is the right word - to get them to adopt the systems approach. Do you

have any feel for what sort of timeframe you're looking at in getting them to adopt that approach?

MS ADSETT That's a really, really good question. I'd say it's short to medium term. I wouldn't want to put a timeframe around it but I know that is something that MPI are actively supporting with us in market over there.

DR PHILLIPS: Yes. I assume it has been part of your discussions. You talked about the research programme from 2014 to 2020. So you sort of started this whole process of looking for alternatives back in 2014, so it's a reasonable timeframe, isn't it?

MS ADSETT: It was 2010.

DR PHILLIPS: 2010, I beg your pardon. Okay. So when you say short to medium is that, what, five to ten years, two to four years, some ballpark?

MS ADSETT: I would be guessing.

MR JONES: I'll have a crack it. It's awkward with Covid and I think what we anticipated we were going to be having more face-to-face relationships. I introduced the idea of the breeding programme earlier on. We've planting our IP in Japan with Japanese apple growers with an aim of having a relationship there where you don't penalise your partners and also to demonstrate knowledge around how to grow product with minimum inputs and a systems-based approach. That has been slowed up somewhat but we would still be confident that a medium term horizon of five years was still achievable.

DR PHILLIPS: Thank you. Yes, I know these things are difficult and I appreciate that. Thank you, Chair. I have no further questions.

CHAIR: Thank you. Dr Belton?

DR BELTON: Thanks, Chair, and thanks to the team for your presentation. Just sort of one minor point really from where we've been discussing. It's interesting, our log exporters tell us the Japanese will do the fumigation of logs in Japan. That in a way doesn't achieve very much but when the problem is Japan's legislation, is there an opportunity for them to do the fumigation of our apples in Japan?

MS ADSETT: I think the issue would be - and correct me if I'm wrong - is that we treat our apples at half the loading to ensure we don't get the damage plus the 25 days in cool storage. So I'm just not sure that there would be the capacity to do that in Japan.

DR BELTON: Okay, all right. That's as far as we can take that anyway but certainly understand the systems approach is the preferred way to go. Thanks, everyone.

CHAIR: Thank you. No questions from me, so we'll go now to the EPA team.

MR BAILEY: Kia ora. My question deals a little bit on one that Dr Phillips asked about the timings. Do you have an idea of how long your apples could be in contact with methyl bromide during the recapture stage to avoid the methyl bromide burn and the impact on quality?

DR KILMISTER: That really will be dependent on three different variables. We know that with methyl bromide the damage will increase with three different factors. That's time, concentration and temperature. So at that concentration with recapture leaving it in that system, not really sure how long but it's also important to note that if we -- that's just one system that we tested it in and the capability to pull the methyl bromide out of that particular system. If we change to another exporter system, it may take longer depending on the engineering requirements of other systems.

[9.25 am]

MR BAILEY: Even just on the trial you had with that technology, were you looking at how long it would take before your apples would no longer be suitable for market?

DR KILMISTER: We didn't do that specifically. We left it for as long as we felt was viable to have fruit that would still be saleable rather than having to destroy the chamber full of fruit.

MR BAILEY: Thank you.

MR JONES: Can I just clarify? I think that the treating of apples with methyl bromide damages their quality fundamentally. It's a matter of how much you let that occur to a point where you find the customer. So you're always losing value no matter what you're doing here. It's a slippery slope.

MR BAILEY: Thank you. That's all the questions from EPA.

CHAIR: Thank you. Mr Slyfield?

MR SLYFIELD: No questions for STIMBR, thank you, sir.

CHAIR: Thank you. I did have a Zoom call up but it conflicted with another one that has come on to my computer. So, are there any other questions that submitters would like to ask?

MS SMITH: Yes, it's Nicole Smith. I have a question but there was one from Dr Melanie Miller, I think it was, if she'd like to ask hers first.

DR PHILLIPS: I think the question from Dr Miller was: did the recapture trials use liquid scrubbing solution or carbon? Is that correct? Excuse me for a minute. There's some slight technical hitch. I'll read it out:

"Did New Zealand Apples and Pears in the recapture trials use liquid capture or activated carbon? Activated carbon provides much faster capture than liquid and may avoid fruit damage quality. Has this been investigated?"

DR KILMISTER: (several inaudible words)

DR PHILLIPS: Thank you.

MS SMITH: My name is Nicole Smith. I'm a member of the Tauranga Moana Fumigant Action Group. I just have some questions about the trials on recapture. When did Apple and Pear start its research on recapture technology?

DR KILMISTER: In terms of recapture technologies, we were quite reliant on what Genera were developing, so we kept in close contact with those to understand at what point we'd be able to trial something that they had made available.

MS SMITH: So, with the 2010 reassessment and the deadline for 100 per cent recapture, just clarifying, it was only -- you waited to see what Genera came up with?

DR KILMISTER: Our focus was on finding alternate solutions and obviously we've been looking at trying to get the systems approach into Japan for quite some time now and also looking at other end point treatments rather than methyl bromide and keeping abreast of what was happening in terms of the recapture technology in New Zealand. Once that became available then we did our trials with that.

MS SMITH: And those trials, I see you're saying 2019 was the first trial; is that right?

DR KILMISTER: The recapture trials.

MS SMITH: And how many container loads were tested?

DR KILMISTER: In 2019 we did --

MS SMITH: All of them. All of them.

DR KILMISTER: There's only two in total.

MS SMITH: Two containers?

DR KILMISTER: Two containers in total.

MS SMITH: Where was that done?

DR KILMISTER: That was done at one of our commercial exporter facilities in Hawkes Bay.

MS SMITH: And have the results of that been provided to the EPA?

DR KILMISTER: We haven't provided them directly to the EPA, no.

MS SMITH: And in summary, to get from 80 per cent recapture to 95 per cent, and this presumably is based on the information that you and Genera have from those tests, it is 75 minutes?

[9.30 am]

DR KILMISTER: In that recapture system, in that system, it was 75 minutes for 80 per cent recapture. Sorry, just to clarify that, in the first trial that we did we had to do some modifications of engineering so it took a bit longer but in the second trail we were able to make sure that we had those things in place so we had a more efficient recapture the second time around.

MS SMITH: Is there any reason why you would not be prepared to accept another recapture system if it worked?

DR KILMISTER: There's none available that we're aware of.

MS SMITH: So as far as that is concerned, is that based on the research that NZ Apple and Pear have done and have you provided that to the EPA, or is that what Genera have told you?

DR KILMISTER: That's what our commercial exporters have advised us.

MS SMITH: Sorry, what does that mean?

DR KILMISTER: So we have exporters that go to Japan, so they have been keeping abreast of technology is available that could be applied to their systems.

MS SMITH: Technology in Japan?

MR JONES: Really technology anywhere. It shows how extremely open we are to

any alternatives, including significant investment. If there is anything out there that you know about, we would be happy to investigate it.

MS SMITH: That is probably not for me say, I am just trying to work out how much New Zealand Apple and Pear -- I understand there has been a lot of focus on a lot of different ways of using less methyl bromide but I am focusing on what the legal requirement was in the 2010 reassessment, which was for recapture. What I was just trying to get was the timeline from 2010 until now and how much focus you have spent on the recapture and how much of your R&D budget has gone on the recapture. That's my question.

DR KILMISTER: Our focus was on finding a solution that didn't use methyl bromide and so we have invested 12 per cent of our annual budget trying to find an alternate treatment since 2010.

MS SMITH: But on recapture, so an alternate treatment, just to be clear, is not recapture?

DR KILMISTER: That was a last resort.

MS SMITH: Sorry, I don't understand that.

MR JONES: We are not focusing totally on recapture at this point. It has been an alternatives and a systems based approach in negotiation a requirement of Japan not having methyl bromide at all. That would be our -- that's our aim, no methyl bromide, of which recapture is an interim step.

MS SMITH: As at October 2020, if the shuttered had come down, you would just be left with whatever Genera told you?

MR JONES: Sorry, what's the shutter mean? Sorry, I am not quite following you.

MS SMITH: The legal requirement, the reassessment as it stands.

CHAIR: Can I just interject here? The questions respectfully, Ms Smith, are getting a little repetitive and slipping into cross-examination. If we could just rethink some of that, please.

MS SMITH: I don't think I need to, I was trying to clarify because the suggestion that I was hearing was that some of the budget, R&D budget, had focused on recapture. My understanding now is that it hasn't. If my understanding is wrong then it is over to NZ Apple and Pear to correct that understanding. That is what I take from the record.

DR KILMISTER: Budget has been available to do recapture if it proves an option for us to be -- if that was the last resort and we have spent budget on that in the last couple of years as that technology has been available.

MR JONES: The information we have showed you costs money to provide and, yes, we have been doing some R&D to provide you with that information.

MS SMITH: I don't have any further questions, thank you.

CHAIR: Thank you, Ms Smith. I managed to get myself sorted out with the technology and I can't see any further request for questions in the chat. Am I correct there? We will take silent as assent.

New Zealand Apple and Pear, thank you for your time, we appreciate it.

MS ADSETT: Thank you.

MR JONES: Thank you.

[9.35 am]

CHAIR: Moving now to our next submitter from EIM Research, and I apologise if I say your surname incorrectly, Mr Bartolo.

New Zealand Apples and Pears, if you could please get your presentation to Ms Quinn for posting on the website, that would be appreciated.

SUBMISSION 127552 - EIM RESEARCH PTY LIMITED

KEVIN BARTOLO PRESENTING

MR BARTOLO: Good morning, all.

CHAIR: Yes, we can hear you.

MR BARTOLO: Good, good.

CHAIR: Sorry, Mr Bartolo, you are up.

MR BARTOLO: Thank you very much. Good morning to everyone. My name is Kevin Bartolo and I'm a founder of the EIM, the GDU, gas destruction unit, its inventor and designer. I would like to thank you for the opportunity to speak today within which time I intend to state the EIM GDU performance and destruction capabilities, provide a basic summary of the fumigant risk profiles, review the options available for mitigation and provide EIM response to the three STIMBR MBIE review proposals. Hopefully that will get through within the 15 minutes so here we go.

Starting off the GDU. The GDU is a patented destruction system that uses a series of thermal oxidative processes followed by a liquid based scrubbing system. It's computer controlled, has full data logging, is completely failsafe in its operation. If any of the design parameters are exceeded in any way the machine will react accordingly and we will shut the machine down in a safe fashion and close off the gas source.

We have remote monitoring and control and full gas intake and emission sensing. The machine has a throughput capacity of 7,200 to, at this stage, 136,000 cubic metres per day. We can do larger. It is entirely scalable and currently in Australia we are looking at system capable of 250 to 450 cubic metres per minute.

The system is Montreal Protocol destruction technology approved, capable of delivering a 99.99 per cent destruction rate. The by-product, importantly, is harmless inorganic salts - in this case sodium bromide salt - sewage admissible and recyclable. The ultimate aim for EIM is to be able to recycle the salts back into the methyl bromide production process or the bromide production process moreover.

Now, as far as I can see the real issue what we are talking here is about the toxic gases themselves. It is about the release of these gases into the environment, whether that is atmospheric, terrestrial, aquatic and whether that's surface or ground water. It's also the harmful effects that these gases have on human health and the environment and/or other life threatening hazards that they may present, in the near term or in the long term.

Like it or not, it seems like we need fumigants to protect our biodiversity from exotic pests and disease incursions and our trading partners need it for the very same reason. That allows us the ability to participate in international trade. It is not as though we want to use these chemicals, they are dangerous chemicals, they are natural chemicals or at least two of the main chemicals are natural chemicals, they exist in nature. The manmade production of methyl bromide is probably around 13,000 tonnes per year. Natural contributions to the atmosphere from nature is in the vicinity of 170,000 to 200,000 tonnes per year.

There is a system out there that takes care of methyl bromide. It is getting better, we are looking after it better now and hopefully the GDU is one of the tools we will use to eliminate methyl bromide from -- at least manmade methyl bromide from the atmosphere.

[9.40 am]

I would talk here about the three main chemicals that we are talking about, that is methyl bromide, phosphide and EDN. What I would like

to do is just do a brief rundown of the time weighted average, that is the exposure level, maximum exposure level for an 8 hour day, the IDLH, which is immediately dangerous to life or health level of the gas exposure, a lethal exposure rate and the flash point, just to give us a snapshot of these chemicals and see how they compare with one another.

I will start with the TWA. For methyl bromide we have the exposure level of 5 ppm, for aluminium phosphide it is an exposure level of 0.3 ppm and for EDN it is an exposure level of 0.9 ppm, or least that's the level that WorkSafe Australia has allocated to that gas. For the IDLH, methyl bromide 250 ppm, for aluminium phosphide and EDN 50 ppm each. Now, if we look at the lethal exposure level - this is the level that will bring about death, certain death - for methyl bromide it's 7,900 ppm for 1.5 hours. For aluminium phosphide, it's 400 to 600 ppm for 30 minutes and for EDN it's 267 ppm is immediately fatal.

Then we move to the flashpoint, to how combustible these things are. Methyl bromide is 194°C. Methyl bromide is said to be flammable, but realistically that falls in the combustible class. Diesel fuel, for instance, is around 68°C and that is classed as a combustible, so I would well and truly think that methyl bromide is truly a combustible. Aluminium phosphide has an auto-ignition temperature of 38°C in air and in the atmosphere and a concentration of over 16,000 ppm will self-ignite. That has a very, very wide ignition level or explosion level. It starts off at 1.67 per cent and goes right through to 98 per cent, so virtually totally at any time it is able to be ignited.

For EDN, that flashpoint is -37°C. For hydrogen cyanide it's -18°C. Now, I say hydrogen cyanide and EDN, essentially really an EDN molecule is two carbon nitrogen bonds when combined with water, that gives you two HCN molecules or HCN and a hydrogen cyanide molecule. It is extremely flammable and explosive. Just to give you a little idea of the explosiveness of EDN, the detonation velocity, that's the velocity at which the shockwave travels through the actual explosive, the chemical itself - in this case, it would be EDN or hydrogen cyanide - is 2,500 m per second, so that's roughly 9,000 km an hour, so the shockwave travels through the gas at a pressure of 57 bar, so that's around 838 PSI.

Now, to give you an idea how that compares with other known explosives, the Beirut detonation or explosion that happened a week or so ago was of ammonium nitrate and ammonium nitrate has a 2,700 m per second velocity. Now, the velocity is indicative of how powerful an explosion will be.

[9.45 am]

The faster the velocity, the more powerful the explosion. EDN cylinders are rated at 110 bar, that's 110 atmospheres, and 14.7 PSI as a standard atmosphere. The hydraulic burst pressure of a cylinder is 176 bar, which is 2,587 PSI. When an EDN gas stream is ignited, it will track back to the cylinder, the cylinder will rocket and it will explode, so that 2,587 PSI still vessel will get just absolutely obliterated, so that gives you some idea of the power of an explosion. In some ways, you can imagine that being a ship in say the Port of Tauranga or anywhere, nearby towns, waterside workers, structures etc, you could have anywhere between 50 to probably 80,000 cubic metres of this gas sitting within a ship. I'm afraid if we had an explosion there, it would be an absolute disaster. The vessel would virtually not exist anymore and the damage that would be caused would be over a widespread area. So it's something I think we need to really look at when we're looking at whatever gases are being used and we need to make sure that we have the precautions, take the precautions to protect ourselves from them.

There are two other differences that HCN, and EDN as its derivative, and ALP possess that MB does not, in that HCN exists as a highly toxic liquid at 25.5°C, which means that any logs, the underside of tarps, the bark on the ground, the ground itself, if it was wet during the time of the fumigation, they become a potential contact poison and a contamination source for liquid HCN for an extended and largely indeterminable period of time after the fumigation. So the EDN has moved into the logs --

CHAIR: Mr Bartolo, I don't want to interrupt your flow, but I just would ask you to reconsider the way you're presenting your submission. We are confined to considering the recapture control of methyl bromide. If you wouldn't mind just sort of reviewing what you're saying and confining yourself to that.

MR BARTOLO: Yes, sure. Sorry, that was okay. There was some mention that the recapture should be a blanket recapture and the reason for this is that it should be a blanket one sort of rule covers all. What I was trying to point out, with all respect, is that these chemicals are vastly different chemicals with vastly different risks associated with them. Those risks may be needed to be taken into account with whatever technology you want to recapture it with. That was the point of that. The explosion risk of course is the worst, but then there are other risks associated with the fact that people cannot smell these gases.

I shall move on then to emission mitigation. The first step, if you like, in the control of (inaudible) is elimination. In this instance here in New Zealand, we have heat treatment and debarking of logs that are two options that do not involve the use of a fumigant. The whole process there, heat treatment is probably not really practical on the scale for the

logs, but definitely smaller articles are. Debarking of logs is being undertaken, I understand, and is working quite well, but they do bring about increased processing costs and extra steps in the transport of the goods to the port. They do come with export trade risks in that, one, that it does add an extra cost and then the second one, that in some cases it does not completely rid the timber of the pests or insects that are quarantinable.

[9.50 am]

Neither treatment will completely eliminate the need for fumigation in relation to quarantine-based import or export treatments. Now, I'm going to include the GDU in this elimination category for mitigation purposes --

CHAIR: Mr Bartolo, just before you carry on, it's great, what you're talking about. However, also our job is not to look at recapture technology and compare relative methodologies. I just remind you that in terms of different ways of phytosanitary measures and so on, that's well covered in the evidence that's been provided to us to date. Thank you.

MR BARTOLO: Okay, cheers. Okay, we've looked at the underpinning knowledge. EIM, I'm not sure whether maybe the Committee can advise me. We've looked at the situation and obviously the methods of containment of the gases, probably the most efficient is a ship's hold. There's no superstructure costs; there's no infrastructure costs. It's probably as near a perfect containment as you can get to conduct a fumigation in terms of its gas tightness.

EIM have designed a system that is especially suited to in-hold gas fumigation destruction that's integrated with the existing ship's fixtures and equipment. It has an extremely low operational cost, near total as possible elimination of fumigant emissions through the entire fumigation application, treatment and degassing process and it allows the gas to be scrubbed during the entire in-transit period of time. Once the gas is applied to the ship, the ship could then technically leave under very minimal negative pressure within the hold and travel its voyage. The fumigation would be done presumably in 24 hours and then the ship can start or initiate scrubbing the timber for the entire voyage until such time as it arrives at the port, at which time the hold should be absolutely completely free of gas and none of it would have been released to the atmosphere.

Look, I did intend to compare the different types of recapture technologies, but if that's something that you don't wish me to do, well, that's fine.

I just think there's one thing I do want to say and I don't think I'm crossing any boundaries here, and that's that I think there's some basic assumptions with the technologies that are evolving, or some basic underestimations, and one is that with carbon-based systems I think there is an underestimation of the volume of carbon that will be required to capture gas in large volumes. Because it's not a one to one ratio where if I used one tonne of carbon to capture 150 kilograms of gas at most, then if I want to double that or triple it, it's just not a case of doubling or tripling the amount of carbon I have. It is actually an exponential relationship there and you will need to use much, much more carbon than what a one to one ratio would. So, that has implications for handling it, it has implications for recapture, it has implications for the disposal.

[9.55 am]

The other one is that with the reuse of methyl bromide I'm not sure exactly how that can occur because in Australia I know it's the case - and I'm pretty sure it's the same in New Zealand - that you can't register a product for use if that product is of unknown formulation, unknown strength, unknown impurities and, therefore, unknown risks and hazards. So, I'm a bit sort of confused as to why companies - and there have been several that have all failed over the course of recent history - would pursue that and if there was any reasoning behind it. It may be that this will be registered, I don't know, but it's just a bit confusing to me at this stage.

So, I'll wrap it up now. In relation to STIMBR proposal number 1, the requirement to recapture 80 per cent of the methyl bromide emissions remaining at the end of fumigation, EIM considers that the elimination of all emissions from toxic gases from the fumigation process should be undertaken in the safest, most efficient and most effective technology and method possible. Seventy to 80 per cent destruction simply does not meet the expectations of the community or society at large. We also consider that it is economically feasible to lower the log stack de-tarping concentration to less than 200 ppm and the EIM GDU emissions are less than 5 ppm and, therefore, meet WorkSafe/TWB daily exposure levels for methyl bromide.

As regards proposal 2, extend the deadline ten years for achieving recapture for ship hold fumigations, I believe that the whole system that we've designed is the most efficient and effective method of containment and destruction available. We believe that this will help streamline the entire transport shipping process and achieve even greater cost savings and boost export competitiveness. EIM considers that the co-ordinated regulatory approach to the task of achieving in-hold fumigation recapture will ultimately lead to shorter implementation times than those suggested or requested by STIMBR.

In regards to STIMBR proposal number 3 to make related refinements to strengthen buffer zones at completion of recapture, EIM considers that the buffer zones should be specific to the fumigant and they should be consistent throughout the entire fumigation period to take account of accidental or premature fumigant release and that whatever limits are set be based on the work that the EPA has done with their modelling and dispersion and the WorkSafe recommendations be based thereupon.

So, that's basically all I've got for you today, guys, so I apologise if I went in a little bit of a wrong direction but that was just something I thought that was necessary to be addressed so that recapture can occur safely.

CHAIR: Thank you and thanks for your submission. I'll now go to Dr Belton for any questions.

QUESTIONS

DR BELTON: Well, yes, thank you for that submission and thanks, Chair. I guess the problem we have is that our applicant and colleagues effectively don't believe that what you're proposing is going to work in the timeframe that we're talking about. How could you demonstrate to them otherwise, please?

[10.00 am]

MR BARTOLO: Well, Covid-19 has definitely thrown a spanner in the works there. We conducted a test in Newcastle on a grain silo, 500-tonne grain silo, the other day. We've done over 500 hours of testing. Our machine doesn't work like the liquid system and it doesn't work like the activated charcoal systems. It works like the engine of your car. It's a process. It's totally consistent. It works on stoichiometry, the burning of the gas. The stoichiometry for a given size engine, no matter how big, is the same. So, that means that we can destroy gases at scalable sizes, volumes, and we do it in a single pass. It's not recirculated, so it's very efficient.

I know that there's a lot of political influence going into this, but I can assure you that this system does well. We're in negotiations at the moment with an Australian grain company to look at two systems, one of 250 cubic metres per minute and the second system at 450 cubic metres per minute. So, we've got the destruction down. We have a destruction rate that is compliant with the Montreal Protocol and, quite frankly, I don't care what other people think. The information they have is three years out of date, so we can achieve a Montreal Protocol reduction, we can achieve scalability, and it is the most efficient way

to destroy methyl bromide that there can be because of the dynamics of combustion.

DR BELTON: Okay. I understand what you're saying there. Have you got data that you've provided to third parties to demonstrate the effectiveness of what you're proposing?

MR BARTOLO: Yes, we've had test results done, analysis done of the destruction of various gases, from fumigants to particulate matter to all sorts of gases, and that data is provided to them. We've done the tests. We've run through, you know, sucked through a grain silo with grain in it. We're all very happy. We want to get going and we go on to a live test with the methyl bromide for that and, unfortunately, Covid-19 has stepped in and stopped us from doing that. We've done over 500 hours of testing on containers and we can clean out a 20-foot container in just over an hour, down to just over 100 ppm.

DR BELTON: Okay. Just really only one more question here, I think. When would it be realistic for us to get data from you to substantiate your claims as an option for going forward?

MR BARTOLO: I'm actually designing an alternative technology which is, if you like, a supportive or a complementary technology to the GDU, which should further reduce the fumigation degassing time by around 50 per cent to 70 per cent. I expect that probably by mid-September I would be able to provide you with analysis of those tests and the report on those tests.

DR BELTON: Okay, thank you very much. Thanks, Chair.

DR PHILLIPS: Thank you very much for your submission. It's following on from Dr Belton's questions and talking specifically to your submission.

[10.05 am]

I notice you have provided us with some data, which is very useful. That's based on 20-foot containers, pine pellets, and which is obviously useful, but I am just wondering about you made a comment just in your presentation just then about how you felt the system was most suited to use in ship holds and obviously there is quite a big jump from a 20-foot container to a ship hold. So I'm just wondering how you would scale -- well, I don't want to know the mechanics of how you would scale up your system, but how can we have faith that the data that you have presented here is actually suitable for use and effective in a ship hold?

MR BARTOLO: It comes down to the reality that what we're doing is we're taking gas from a gas enclosure, air from a gas enclosure and we're combusting it. Now, the amount of air that you combust then gives you the throughput that you need. For instance, if we were to look at a 50 litre diesel, that

diesel will ingest and destroy 136,000 cubic metres of gas a day. Now, that's 2.4 times an average log vessel hold volume. So by the time you take the logs out of that, it's many more rotations, many more air exchanges than that. You can increase -- by increasing the engine size you actually increase the volume that you scrub. So, technically if I were to take -- let's for instance to say I used the ship's engine, the main engine, that would be able to -- for a 6 cylinder unit, 1,800 litres per cylinder, I'll be looking at 1.3 trillion cubic metres per day. So it's as scalable as you'd like it and the stoichiometry, which is it takes X amount of air to burn X amount of fuel, is exactly the same no matter whether I've got a 3.9 litre diesel or a 50 litre diesel or whatever. So that's how the scalability comes into it.

DR PHILLIPS: Yes, thank you. I guess the problem for us is the only data that we actually have is for a 20-foot container and ideally we would actually have some data on ship holds so that we -- because there are differences, obviously, in just the environments that these things operate in, but that's fine.

My next question is you made a comment just at the very end of your presentation that this technology meets the 5 ppm concentration and I notice you've also said that in your submission, but you also say in your submission that -- in fact I'll read it out:

"EIM research has proven that the proposed 5 ppm headspace gas concentration target is achievable, but definitely not in an economically viable timeframe."

I'm just wondering how we can then marry that with your statement just now that you've said that 5 ppm concentration is achievable.

MR BARTOLO: Yes. What I'm saying here, to achieve 5 ppm scrubbing from a log stack you can do but the trouble is as the concentration in the logs and the concentration in the air space gets closer together the time taken to scrub is just too long. There is not enough concentration gradient for it to flow quickly from the wood to the air. So naturally what happens is you get a massive rapid decline and then that tails off and drags on for ever. So it's not economically viable. What I have said in this presentation is that the outfall from the GDU is always less than 5 ppm. It's actually probably more like a half of the ppm but the reality is that you're not going to -- the GDU outfall, the gas that is processed is less than 5 ppm, but if you're asking me can I get a log stack down to 5 ppm in an economical time, and that's being, let's say -- you know, it might take four hours to get that 20-foot container down to 5 ppm and it depends purely on the absorptive qualities of the product that is being fumigated.

[10.10 am]

DR PHILLIPS: Yes, okay. Thank you. No further questions.

CHAIR: Thanks again for your submission. You'll be aware, of course, that our role is not to compare different recapture technologies and the thrust of our questioning is that if we were of a mind our role is to review and reset recapture standards. So I'm curious as to whether your technology is in use in New Zealand or internationally and if such use demonstrates recapture to 200 parts per million. I don't want to put you on the spot but just in the context of us reviewing recapture standards at the scale that we're talking about within the log industry, whether there is any demonstration of that. Thank you.

MR BARTOLO: You're seeking a response from me on that, are you, just clarifying?

CHAIR: Yes. I'm curious as to at what stage you're at in terms of actually testing your technology on the scale of log stacks either within New Zealand or internationally and whether that has also demonstrated 200 parts per million.

MR BARTOLO: No, we haven't done that. We've been prevented by Covid-19. Our testing was going to occur, scheduled to occur with Genera down in Victoria in Portland and, unfortunately, with the outbreak there that has just basically locked us all up. But in line with the September supply of data that I've mentioned to you guys, I'm sure we'll be -- as soon as Victoria opens up again we'll be able to do that. In the meantime, we will be looking hopefully at taking the machine up to Brisbane for degassing trials on a silo up there and I can keep the Committee advised as to how those progress.

CHAIR: Sure. I just want to clarify too the questions earlier about providing data and evidence, that's not a formal request from the Committee to provide that information.

MR BARTOLO: I can make it available to the EPA.

CHAIR: Yes. Well, that's on your prerogative but it won't be as part of this process. So, thank you very much. If we decide we want additional information we will issue a direction accordingly. So, thank you, that's all the questions from me. I'll now go to the EPA team.

MR BAILEY: Hello. Lee Bailey from the EPA. The question I had in mind the Committee has already asked, so thank you, Committee. No further questions at this time.

CHAIR: Thank you. Mr Slyfield?

MR SLYFIELD: No questions from STIMBR. Thank you, sir.

CHAIR: Thank you. I've had one question appear on the chat from Mr Falco. Just noting, Mr Falco, you've heard me at it. You guys are in similar industries so I'm sure you'll moderate your questioning accordingly. Kia ora.

MR FALCO: Kia ora. Hello, Kevin.

MR BARTOLO: Hello, Joe. How are you going?

MR FALCO: I'm good thanks, Kevin. We've discussed your potential technology at several occasions in the past dating back a couple of years now. I can't remember, when did you first let the industry know of your combustion technology to deal with methyl bromide?

MR BARTOLO: Look, to run a timeline on it, Joe, when I first let the industry know it might have been 2018, I reckon.

MR FALCO: I remember speaking with you at a conference, the methyl bromide conference, MBAO, in the US and you discussed with several people there that you were looking at putting a prototype system in the US for trial at around that time. Did that ever occur, because I haven't heard much about that?

[10.15 am]

MR BARTOLO: No, I'm still in contact with the USDA on that. Quite literally, the funding is not there to provide them with a machine at this point in time. We're still in contact with them and as soon as it becomes economic or we're able to provide them with one trial, there will be one going to the United States.

MR FALCO: Okay.

MR BARTOLO: There was one scheduled to leave ex New Zealand but the whole process took that long I had to upgrade the machine. So rather than -- it was just sitting on a wharf for nearly six months in New Zealand. I had to bring it back here to Australia so I could get doing the upgrade that I wanted to do rather than send it to them.

MR FALCO: Kevin, we can relate to that. My last question, Nordiko, we have looked at combustion technology as a chemical engineer. Burning of unwanted emissions, chemicals is not uncommon in the chemical industry. In the petroleum industry you'll see flares in oil refineries and what not and that's what they're doing. One of the, I guess, by-products of burning a particular molecule or chemical when you incinerate it is a formation of other airborne pollutants as I'm sure the EPA would know. We've looked at your process. You've got patents in place in

Australia and we've had a look at how you do it, but at the time how do you deal with the toxin dioxin by-products that are formed through the combustion process?

MR BARTOLO: We've had tests done on that, Joe, in New Zealand actually it was done, conducted, and dioxins -- indeed dioxins are formed in the log stack, furans, dioxins, alkyl furans, by the hydrolysis process. We had tests done and analysis done on dioxins and furans of all types and basically we destroyed -- with the process we have we've destroyed virtually every one. I think there was one that we significantly reduced the emission. We are talking about well, well below, many times magnitudes less than the global standard but there was one that we reduced down to, I think, 700 ppb and another one that actually had a small increase.

Every dioxin and furan we did, with the exception of about two, were not detectable at the parts per billion level, the other two, one was only 700 ppb and the other one was something like 100 and something parts per billion but we increased it from maybe 70 to 100 or something like that. There was a minor increase on what was detected at the inlet from the log stack to what came out the back of our machine.

MR FALCO: Thanks, this is important to the industry and the process because I was referring to methyl bromide -- bromine like atoms bromide, now you can't destroy atoms or create them, you turn them into something else.

MR BARTOLO: Correct.

MR FALCO: What actually happens in the end to the bromide atoms?

MR BARTOLO: It gets turned into sodium bromide salt.

MR FALCO: To salt? Okay. No more questions, thanks, Chair.

CHAIR: Thank you, Mr Falco. That's all that I have up. Are there any other submitters who have questions for Mr Bartolo?

MR GLASSEY: Chair, it's Ken Glassey here, I have one.

CHAIR: Away you go.

MR GLASSEY: Is Mr Bartolo aware that international maritime law prevents sailing of a ship with methyl bromide in the holds?

[10.20 am]

MR BARTOLO: Yes, Ken, I am aware of that. What I indicated was we would need some degree of international co-operation or co-operation is I believe

that if we embark on a process of negation with the IMO, we could actually demonstrate that this technology, which is not only good for just methyl bromide but for other gases as well, could be used to make maritime safety a much safer event. Indeed, it's like 57 sailors last year in various accidents just in Russia alone died from being fumigated or exposed to fumigation in ships holds or in ships. It was more a case of, yes, I'm aware of that and I'm trying to get the most effective way to capture all the methyl bromide so we can capture it right down to the less than 5 ppm that we're seeking but not have any exposure to it.

That would take agreement with the IMO to have a look at the system and endorse it and my belief is that if they can sail currently with a gas that is 16.5 or 16.66 recurring, that is only in phosphide, if they can sail with that in ships there's no reason why they shouldn't be able to do it with methyl bromide either, providing the safety of the system was such that there's no way the gas could escape the hold because it would be kept under negative pressure.

CHAIR: Thank you, Mr Glassey stayed on mute so we'll assume that that is all the questions from him. Nobody else has got their hand up, I don't think. Mr Bartolo, thanks again for your submission.

We have reached a significant milestone in that we have heard from all the submitters that wished to be heard, other than the flight disruption this morning, and we have also benefited as a DMC -- I think I speak on behalf of my colleagues that we have benefitted from your submissions during the course of this hearing. They have been rich, detailed and passionate. Technically detailed as well. They have certainly clarified and explained a lot of the things that we are tasked with deciding. That has been very helpful. I do want to thank you all for that.

We will now go to morning tea and then we will hear closing submissions from the applicant. I will just do a final reminder that at that time the only questions that will be asked will come from the DMC. Please enjoy your break. According to my watch, it is 10.23, let's make it 10.25, and 15 minutes so at 10.40, Mr Slyfield, you're up.

ADJOURNED [10.23 am]

RESUMED [10.41 am]

CHAIR: Kia ora. Welcome back. We now turn to Mr Slyfield and whoever you are wanting to call from the applicant during this process. Kia ora.

APPLICANT'S RESPONSE TO MATTERS RAISED

MR SLYFIELD: Thank you, Mr Chair and Committee. Can I give you this roadmap for the reply. We are going to call Dr Armstrong very briefly, Dr Fletcher and Mr Sullivan. Those are three witnesses that you are going to hear from in that order and Mr Sullivan will be the longest of those three by some margin. Then at the conclusion of their presentations you will hear again from me with a legal wrap-up on all the relevant issues, including the important matters that have been raised concerning the scope of the application. With that outline in mind I am going to hand you over to Dr Armstrong who has prepared a brief presentation

DR JACK ARMSTRONG PRESENTING

DR ARMSTRONG: Kia ora, can you hear me?

CHAIR: Yes, thank you.

DR ARMSTRONG: I have been asked to respond briefly on four matters raised in the hearing for the purpose of clarification. I acknowledge that the DM has made it very clear that it is not its role to evaluate recapture systems and I have tailored my responses with that in mind.

Mr Falco presented you with information about recapture of methyl bromide from a 25,000 cubic metre silo in Newcastle, Australia. Earlier Mr Bartolo also referred to grain silo studies. They seem to be implying that this demonstrated the feasibility of recapture from ship holds. If so, I do not agree. A silo fumigation where there is a bung at the bottom of the silo for removal of methyl bromide cannot be physically compared with a ship hold where exhaust systems are required to remove the methyl bromide from the top, which has proven to be exceedingly difficult for Genera to accomplish.

Additionally, recapturing methyl bromide from silos containing commodities with low moisture content, usually in the range of 12 to 14 per cent enhance a dry atmosphere, cannot be compared to recapturing methyl bromide from ship holds or log stacks for that matter where the high moisture content of logs is greater than 80 per cent creating a water charged atmosphere that will result in water being preferentially absorbed by the carbon and thereby reduce the recapture efficiency.

(2) Mr Falco also made claims about the relative efficiency of activated carbon based recapture systems compared with liquid scrubbing systems. A major problem with activated carbon based systems is the massive volumes of toxic waste that they generate. Using information provided to me by Genera and their knowledge and use of activated

carbon based systems, including the Nordiko system, I made the following calculation.

Assuming a 50 per cent absorption rate by the logs during the fumigation and a recapture rate of 80 per cent of the methyl bromide remaining in the air space at the end of fumigations, the volume of methyl bromide saturated carbon being sent to landfill each year would be about 3,000 cubic metres. To put this in perspective, that is the equivalent to the volume of 1.2 Olympic swimming pools. This toxic waste issue is but one of several reasons that activated carbon-based systems are not currently considered a viable methyl bromide recapture technology for log stack and ship hold fumigations.

[10.45 am]

(3) One of the challenges for extraction of methyl bromide from ship holds is the difficulty in getting the air to circulate throughout the hold. The EPA staff have queried whether this means ship hold fumigations may not comply with the ICCBA methodology. I cannot directly comment on the contents of the ICCBA methodology, but I observe that the difficulty of getting air to circulate so that it can be extracted through the hatch at the top of the hold does not indicate that there is any similar difficulty in getting methyl bromide to distribute throughout a hold during the fumigation cycle. The heaviness of methyl bromide relative to air assists in distributing it around the logs, but that same heaviness makes it difficult to extract.

(4) Dr Miller presented you with information that India approves, along with methyl bromide fumigation, the use of heat treatments. The use of heat treatments is specific to lumber, or in New Zealand timber, and wood packing materials in small containerised treating systems. The use of heat for logs, as pointed out in the Armstrong et al 2014 Comprehensive Review of Disinfestation Methods for Potential Use as Quarantine Treatments for Export Logs, cannot be carried out either technically or economically. Dual heating being developed in New Zealand and funded by STIMBR is the only technology that was found to be capable of heating a log within a relatively short time to a temperature able to kill target insects. The concept has been proven and work is under way prior to a pilot being conducted for further testing. Only when that is successful will the feasibility studies for a commercial-scale plant be considered.

Finally, I want to state for the record that I read again submissions made by Naudiko and EIM and I've considered their verbal statements to the DMC. Nothing that I heard or read would cause me to change the information given in my 2019 review of methyl bromide recapture and/or destruction systems or technologies. Moreover, until purveyors of recapture and/or destruction equipment can provide adequate data

and commercial efficacy demonstrations to support their claims, I would caution potential users to beware of buying into technologies unproven for log stacks and ship holds.

MR SLYFIELD: Thank you, Dr Armstrong. Mr Chair, members of the Committee, I'm in your hands as to whether you might wish to ask questions as we move through the three witnesses that I've signalled will be recalled or whether you would prefer to save those for the end or some other?

CHAIR: Thank you. We've got no questions for Dr Armstrong.

MR SLYFIELD: Thank you, Committee. Then the next witness that STIMBR is recalling is Dr Fletcher, who also has a brief presentation.

DR DAVID FLETCHER PRESENTING

DR FLETCHER: Yes, mōrena. I would just like to reiterate my concern with using very high upper percentiles in this kind of work. As a statistician, it's well known that trying to estimate the true upper percentiles that might occur in practice is very difficult, and I mentioned that in my evidence statement last week. I just want to share a document I've created just to illustrate this perhaps more clearly than I did last week, hopefully.

This graph here, if we look at the red dot on the left-hand side, the 95th percentile, that's the true percentile under a hypothetical scenario, so not to do with David's modelling but related to it from a statistician's perspective. So I've said, right, the true 95th percentile that will occur in practice is somewhere just above zero there. As we go up to the 98th it increases, obviously, 99, so those red dots are the targets.

[10.50 am]

The aim of any modelling work is to estimate those red dots as well as possible and you can see from this simulation I've created mimicking roughly what would happen with a 24-year simulation in the current context you'd get -- estimates are the black dots from 10 repetitions of a simulation over 24 years. The typical thing that a statistician would do is say, "Well, we've done this simulation modelling once, what about doing it again?", get some replication, and you find that at the 95th percentile on the left there that all the ten dots, the black estimates, are all pretty much on target, everything's on target. Go up to the 98th percentile, you can hardly see any variation. There are actually ten black dots there but they're all again very close to target. Same for the 99th, a little bit more variation.

I've mentioned in the document that once we get to the 99.9th, which I note is the recommended percentile in some settings, you're seeing quite a bit more variation but really the extreme end of this, the 99.99th

shows there things can really not reach their target. So, in any one simulation exercise you might get a 99.99th percentile up here or down here. On average it might reach its target but in one simulation modelling exercise it could be way off. This is essential, I guess, why people qualify -- prefer not to use the 100th percentile because in some of the documentation it's been recognised that the 100th percentile is prone to this problem. I'm just illustrating the fact that it can happen earlier than the 100th percentile, particularly in this example at the 99.99th.

So, to emphasise, this is something very well known to the statisticians and this kind of variation you'll see arising in David Sullivan's talk as well. That's all.

MR SLYFIELD: Thank you, Dr Fletcher. Unless there are any questions from the DMC I'll move on to the next person.

QUESTIONS

DR PHILLIPS: Yes, it's Dr Phillips here. I just had one question. So, on the face of that graph, it could be argued that the 99.9 percentile, from a modeller's perspective they might be pretty happy with that range.

DR FLETCHER: Yes, agree. I think David Sullivan will show variations similar to that. In this particular example I've tailored the example to closely match the kind of thing that's coming out of David's repetitions of his modelling. So, yes, I agree with that.

DR PHILLIPS: Okay, thank you. I just wanted to clarify that, so thanks.

DR FLETCHER: Yes. There might be situations where that wasn't the case, say with a completely different context, but in this setting it looks to be a reasonably moderate amount of variation there.

CHAIR: Thank you. That's the questions from the Committee. Back to you, Mr Slyfield.

MR SLYFIELD: Thank you, Committee. The next witness is Dr Sullivan, who hopefully is on the line with us. Dr Fletcher, you might just have to unshare your screen.

DR FLETCHER: Yes, if I can find that, yes.

DAVID SULLIVAN PRESENTING

MR SULLIVAN: Okay, can you see my screen? Is it being shared?

MR SLYFIELD: It hasn't come up yet. We'll give it a moment. No.

MR SULLIVAN: All right, let me try again here. Can you see the screen at this point?

MR SLYFIELD: Yes, now we can see it, thank you.

[10.55 am]

MR SULLIVAN: Thank you, Mr Slyfield and Chair. I'd like to start by first acknowledging the folks that did the hard work on this, and that would be Dennis Hlinka and Mark Holdsworth. They did much of the heavy lifting and worked long hours getting this analysis done, so I did want to give them an acknowledgement for the hard work they had accomplished and good work they've done.

In terms of this rebuttal testimony or reply testimony, I'm going to briefly address some issues that have come up during the hearing whereby there has been some misunderstanding in some cases of what we've done, others where I've heard the comments and I agree. I think the objective that I can see, maybe the best results for the DMC, would be if the modellers can harmonise their approach and have a consensus approach going forward to the DMC. I'm an optimist but I do believe that can happen. I don't think we really are that far apart and as I go through this presentation I think you'll agree. So, that's kind of where I'm trying to head with this.

Lastly, at the end of my reply, I'd like to get into the issue of measured data. I think it is important that that be upgraded so that the buffer zones that are set could be confirmed over time, and I think there are perhaps more cost-effective ways to get that done and I wanted to share those thoughts for consideration.

I have a lot of topics here. It's probably going to take 35 to 45 minutes to go through these. Some I'll spend very little time on but I'll present them for the record. Others I'll spend more time because I believe they're more important and critical for understanding exactly what we've done.

I want to start with a topic that's come up a few times and that's the issue about percentiles, which can be a confusing topic. The issue is what is the best international practice regarding percentile use in air quality management? We've gone through and my staff has pulled some examples that they could find online of what different countries are doing in that regard. It think it might be helpful in terms of perspective to see that. I am going to start with an example of the World Health Organization. You can see they're relying upon these particulate matter standards, the 99 percentile. Their PM unit, it varies, 99 percentile, 99.2, up to 99.8 percentile. They are allowing exceedances, as you can see here. That's common practice.

United States: we had old standards going many years ago that were the second high used, but all standards since then are in the 98 to 99 percentile range. Ozone is a special case at 99.9. But the main point is they allow exceedances, and for good reason, because not only do measurements have variability, so does modelling. If you try to manage air quality at 100 percentile, it would be unstable. One year you'd be passing, the next year you'd be not passing, you'd be all over the map. That's probably a primary reason why they stay below, usually in the 98th to 99.9 percentile range, depending upon the country and the circumstance.

I have a few more examples. Canada goes with 98 percentile except for ozone. Brazil is stricter, they allow only one exceedance per year. India relies on a 98 percentile and the United Kingdom ranges from the 98 percentile to 99.9. So the perspective I'm trying to share here is it really is problematic trying to regulate the 100th percentile. You regulate typically at the 98th and 99th percentile with the understanding that the benchmark that's set is set with a regional margin of safety, that 1 or 2 per cent is built into the standard. They expect that. That's typically what's expected when your standards are set. So that's kind of some background on that issue.

I want to show a little bit of background on the margin of exposure. By that I mean the times when you're in that 1 to 2 per cent range. What does that really mean? Does that mean there's a health effect or does it mean you're entering the margin of exposure? This is just an example I showed earlier of the blue, showing the TVOC data, the total volatile organic carbon data, and the methyl bromide paired data when they had that at the port. The highest value is a circle and the 99.9th to the 99.99th of our modelling is shown. It's reasonably in the range, it's approximately bracketing the range. Let's look at a broader perspective. This is the same information shown with a larger scale. The value is set for one, the one-hour TEL. This one, you can't see it here, but it's one.

[11.00 am]

The safety margin is 60. That means the safety margin would take you up to 60 ppm based on the old standard. The reassessment done by Dr Pemberton is just to assess what the latest literature is showing, because the earlier standards base was worked on back in 1942. He is saying the standard should have been 15. We haven't talked about uncertainty factors, but the point I'm making here is that there is room for movement within this particular range, the margin range, and entering 1 or 2 per cent of the year would not be expected to cause a health impact. I will defer to experts such as Dr Pemberton for details, but that's how standards are set internationally for air quality.

As another point of perspective, the work done by Mr Todoroski, which I think is useful in terms of it shows upper bound analysis, which is another perspective for the DMC. This is taking the ship-only analysis at 200 m and taking away the control. In this particular table or figure, it was including 80 per cent control. I take that away and even with the upper bound at 35 ppm, we're still in this margin area here. So I'm not suggesting that you should willy-nilly go above this value of the TEL, but I'm saying if you have limited entry, the controlled entry, that that's standard practice and should not be a major cause of concern.

We need to spend some time on what we're referring to as the fundamental error. I do want to acknowledge the fact that I appreciate that Mr Todoroski identified that issue. That was not easy to do. It's certainly much appreciated and we have corrected that. I just want to show you the significance of that, which isn't a lot, but it would have been impossible for Mr Todoroski without having all the codes and the data files we have to probably have realised that the significance actually was very, very small and I will explain why.

I just want to give you a general concept of what a receptor means in a model. This is showing, for example, our 3 km grid model receptor network, 50 m, go further away, 25 m closer in, per the expert statement's recommendations. Every intersection point is a receptor. That's where the model computes an estimate. We have a few receptors among the thousands that have been affected by this issue. I say a few, sometimes it is up to 68, sometimes it is a couple. I will share the perspective on what happened.

There were three examples that Mr Todoroski provided and I will give some indication of that in my slides that follow. The first one, which was referred as Run 2I, he did find an example there where the maximum at the 100th percentile was missed and that was an exception. That was not found in any other files that we ran. I do want to point out - and again, Mr Todoroski would have no way of knowing this - we didn't use Run 2I in this modelling report. It was a test run that we had done.

The other two examples that I'll show, you'll see that the shift that occurred because of this sorting error basically shifted things along the boundary. It didn't affect the results much at all. Some numbers changed on two pages of the report, which I'll show and have shown earlier. The conclusion was incorrect that the error caused fundamental errors. It caused errors, but they were not fundamental, they were minor and I will explain in figure form why that's the case.

First, once we got Mr Todoroski's comment, we did go back and identify the cause in the code, one letter in one division statement

needed to be corrected, which we did. We prepared before and after columns in Excel files that compared hundreds and thousands of receptors to see where the differences were and I'll show you some examples of that that follow. The first example, like the Run 2I that Mr Todoroski appropriately pointed out, for that particular run, two of the receptors out of more than 1,500 were mischaracterised.

The other files had a minor shift among the boundary receptors that basically took the receptor maximum and moved it 20 m away, so it shifted everything down the line and that's why that did not cause noticeable impacts in many locations in the report at all. We were fortunate that that particular error really did not affect much in the report.

So this is the first example, the Run 2I example. It's an eight-hour run. Mr Todoroski pointed out receptor 4, which was off, no question. There was a 65 per cent difference to that one receptor.

[11.05 am]

There was another receptor that was about 5 per cent off. The remaining receptors - there were 2,090 remaining receptors - had no change. This is perhaps more typical of what we saw in our runs. The early receptors in the set, which were boundary receptors, shifted 20 m, so that it didn't really change our boundary assessments significantly in almost any case, especially for the higher percentiles. There were a few others that changed that were not associated with that, some minor changes of a couple of receptors. One was the 8.44 receptor, which is one that Mr Todoroski appropriately noted, but the rest of them had no change at all is what occurred.

This slide is just for the model. It's showing the ship, so this is the original and this is a particular receptor and it basically just shifted into the receptor in the line along the boundary, so it shifted. It didn't really get the wrong value. It got the correct value, but it shifted it 20 m down the line. So I showed earlier what that did to the analysis. I won't dwell on it, but this is the far field modelling. It changed four numbers in this one table and again the change would be in the second highest 24 value to be in the highest 24 value over 24 years. It made that particular shift. It doesn't really change the conclusions in any way, but it did affect those numbers. Similarly for the near field analysis, it didn't affect any of the 99.9 or 100 percentile values, the way it turned out. It had some shifts, about six values or so, for the 98th and 99th percentile, but this page and the previous were the only changes you would notice in the report at all. The figures were not affected.

So the summary of the error, yes, it was an error. We acknowledge it. We are grateful that Mr Todoroski pointed it out. Those two tables are

now corrected, for the record. They're in the files now in this particular presentation. The significance was minor. In addition, none of the other analyses could have been affected, the deterministic modelling and the large full-scale three-year grid modelling could not be affected. That programme wasn't used for those at all, so it had no effect on the conclusions.

Our request - this is just a request - but we would appreciate the record being corrected that, yes, there was an error that had a minor effect on the report. It wasn't a fundamental error that affected all the modelling, because that is what is stated now on the record. That is not actually correct and we'd appreciate a clarification. So that's enough about that particular error.

Let's talk about the issue about Monte-Carlo simulations. I accept the recommendation from Mr Todoroski and I think from Ms Barclay as well that they would prefer to see more simulations, that we captured those higher values from the ships and so forth, and I agree. I'm going to show you the assessment of what we've done. I don't think it's going to make a large difference, but I think it's a good idea. Let's just focus on the one-hour averaging times. The rest are very similar. I modelled the 24 years to get the 100th percentile, 99.9th and so forth, showing right here, then I repeated it three more times. I did 24 more years here, 24 more years, did it four times to come up with a composite 96-year dataset.

You see the 100 percentile, it jumps all over the place, as Dr Fletcher appropriately pointed out. As we go down further, like the 99.9th, this gets much more stabilised. By the 98th, the 99th, it's very stabilised, about the same number with a round-up. But I think we can do this, we can do more simulations and by focusing on the core and realistic scenarios. We have tried to run all the scenarios that the expert panel identified. It was really not feasible timewise but I think that we can focus and give more priority to some of the comments raised by focusing on the important scenarios, such as what if 100 per cent can be captured at 30 per cent recovery or 70 per cent at 30 per cent recovery. If we focus on what is achievable and realistic we can refine the modelling as the other experts have questioned and basically accept almost all their comments. I'd like to see harmonisation. I respect the other members of the expert panel. They have excellent skills. I think working together we can come to, I think, consensus on these points and give the DMC analysis that is much more consensus than we're at right now, ideally full consensus.

But here's the problem with the distribution going to 100 per cent. Again, you have an unstable basis for recording anything.

[11.10 am]

If we run analysis four different times, four different datasets and it's jumping, and basically if I did it in the year I'm pointing at now I get a 9.5, I run it in another year I get a 15.5. That's really not acceptable in terms of management of air quality. As you go down to more realistic percentiles, such as 99.9, now we get stability and we have much more confidence that these results could be stable, won't change much.

Now, ship impacts have come up a number of times and I think there is some need for clarification on this. At the expert panel we talked about every two hours a ship hold opening for the scenarios and, for the validation scenario, assuming one hold per hour. It appears that in practice the holds are open much faster than that and so at the moment we've done every hour for the validation runs, base runs. Every two hours is what the expert panel and I believe should be happening but in some cases does not. So the modelling we've done for the ships net context is going to be more along the lines of what we feel as a panel should be done not necessarily what has occurred consistently in the past.

Now, in some respects the issue with ship impacts are going to be reduced especially by the scenario I'm describing where you're opening holds one hold per hour or every two hours. First of all, in a lot of cases the distance from the ship to the boundary is much larger than some of the areas from the log stack fumigation so you have the benefit of dilution. Secondly, the ships have a larger cross wind initial dispersion, initial mixing and dilution. That's not a huge factor but that's going to help relative to log stacks and also reduce the impacts. But the big one is if you open those holds once every hour or once every two hours, we divide the maximum one hour emissions by a factor of fivefold. Once you do that, the ship impacts, which only happen perhaps six or seven times a year at Tauranga, that gets more like a large log stack, which happens much more often. It brings it down from being a big outlier to being much more in line with other things.

So what we'd like to propose is that in the final analysis that we do model the ship, as Mr Todoroski has appropriately pointed out, using a 96-year analysis focusing our impacts on the hours we have non-zero emissions from those ships and show the analysis that way to cover the point that he has appropriately raised. I think that is one example of how we can achieve hopefully consensus on methodology in moving forward to the final set of analysis that could guide a DMC in buffers on sediment.

Now, I'm right now focusing on some of the examples. This is in 2018 on TVOC data when they had a ship death occurring. In 2018 you can see good examples where at the boundary we have a 3.3 ppm and a 4.29 ppm. That is obviously over the 1 ppm standard if we assume all

of this material is methyl bromide, which is a conservative assumption. You'd note that if you were to divide those by five and only allow one hatch per hour or more that those numbers would all be below 1 ppm. Similarly for 2019 we have some examples as well from that year. We have one exceedance of 1.3 and again if those are divided by 5 we're down to a very natural number. The rest are not enormously high compared to log stack data.

This is analysis from one of Ms Barclay's reports. This shows another example of ship fumigation and shows the variability as she has described in her presentation, which I agree there is a fair amount of variability occurring. We are going to look at the worst case hour and this again is above the 1, not by a lot. We estimate maybe about a 1.2, 1.25 or so, but again slower opening of the holds would be a rather simple step. I can't say in terms of logistics it's an easy step but in terms of managing the ship's emissions and making them much more compatible with the TEL, this would be one to achieve that I believe would be quite successful.

[11.15 am]

Another point that was brought up by Mr Todoroski that I agree is a useful assessment, he was asking why don't we do an assessment that measures data with -- specific methyl bromide data with the modelling for CALPUFF. We're using assumptions that we have with the expert panel. We did not have time to do that in our assessment but I was quite impressed, frankly, by the analysis that was done by Chris Bender in WorkSafe where they have done that analysis using CALPUFF, same model we are. I thought got quite satisfactory results and I'll show you why, not on a one-by-one basis but on a distributional basis, which is the most fair to assess this. The modelling was, I thought, quite good. They did have one example of a ship impact where they had measured data they collected. It was quite far away, 760 metres away. The wind was strong, which would promote dilution, but the maximum there was PDP 0.5 ppm and the methyl bromide was 0.8. That's the data that we have really to judge but I think again there are ways to reduce these impacts. In summary, really the main point is if they can go down to one hold per hour or one hold every two hours this would be in a much better place, in my judgement.

Ms Barclay, and I think Mr Todoroski, also raised the point that if we had subdivided the volumes first that's how we're treating the log stacks in a ship is volume sources -- that if we subdivided them more we could have got more accurate answers. I don't disagree, that is true. It's well known, if you subdivide a volume source you can reduce the uncertainty a little bit. What I'm going to show you here is a test that we've done that has taken a 25 by 25 metre volume source and then subdivided -- then also subdivided into 25 smaller sources and so the

large -- what we have done is shown in blue and the refined is shown in I think it's orange or brown, whatever this colour is. This is showing it 10 metres away, 20 metres, 30, 70 and 90. You see it's converging almost in the same number.

It's not that different over here either in terms of the relative concentrations we're showing, but the problem that we have in subdividing, the reason we did it, if we were to subdivide this example from one to be in 25 sources we would increase our run time. It's not exactly linear but you could say 20 and 25 fold longer run times and it would be really a long time because the runs take about two days as it is because we have a pretty dense receptor grid. So my point is that the volume source treatment -- I don't disagree with your point but in terms of this assessment I think that the way we've done is suitable and makes a reasonable comparison between run time and accuracy, but I'm open for further discussion with them on further ways we could do it.

This is getting in the PDP WorkSafe data, which I alluded to a few minutes ago. I'll go to the data where it's near the boundary, so 100 metres or more examples where things have settled down at more boundary level analysis. Again, I thought the one hour data had good performance when viewed on a distributional basis. We saw that a one-minute basis was very challenging, not so good, the depth not unexpected. So this is showing the results for different trials that we've done and showing the CALPUFF one-hour model results in grey and in orange or brown it's showing the actual measured values. You don't see fantastic one-to-one correspondence.

Sometimes the capture is too high, sometimes the model is too high, but the fairest way to assess it in the distributional sense across all those periods: is the model doing a good job of describing distribution or not? And I want to argue it is. If you look at, you know, from the smallest to the largest, it's tracking reasonably well. The model is a little bit low in the region of, I'm not sure, maybe a 90th percentile or so. When it gets to the top it gets to be more conservative, which is not really necessarily a problem in my view. So I found this analysis quite helpful. I think it goes a long way in meeting the quest that Mr Todoroski has, and we can talk about that, but I think this is a very good start in getting that done.

I do want to clarify distributions. All distributions are not the same. It depends what the basis is for the distribution and so this point I think it is important that the DMC be informed on so that you can make a judgement fully understanding what we've done.

[11.20 am]

The modelling guidelines do reference a 99.9 percentile but in the fine print of that it says that is based upon a full year of meteorology, 8,760 hours of analysis. That's every hour of the year. We didn't do that. In other words, what we did to be more conservative, we based the distributions only on the hours where there were non zero impacts. That makes our analysis -- so out 99th percentile I'll show you in a minute, is equivalent to one hour, the 99.9 percentile, and that point, I think has -- we didn't explain it well enough in our report but I do want to make sure it comes across now. In the final assessment we can show it both ways and I think we should, to match up with recommendation 53. That fact is quite important when you are interpreting the data that we have done.

This gives you perspective. This is looking at all the receptors along the boundary. So every 20 metres along the eastern boundary we have a receptor and over the course of a three year, which we use as our assessment here, there are 26,280 hours of data. The average that we pulled was only a tenth of that approximately, 3,338 hours. It ranged from 2,208 to 4,338 along the boundary. So, again, the 98 percentile we would be showing is equivalent to 99.75th percentile in New Zealand guidance.

The 99 percentile is equivalent to 99.9 percentile, the 99.9 is approximately the 99.99. This is very important. I think I should have done a better job explaining it earlier.

Other points that came up during the review, reports by the other modellers, is we didn't model all the deterministic scenarios. And it is true we did not. We did not have time to do all those. That just means that the modelling where we assumed the worst case emission happens the entire work day at the port we will get worst case impacts.

I want to show you why we did not. This is just an example looking at eight hour modelling for a particular source, a 1,250 cubic metre source that Ms Barclay indicated. It was in the signed statement, we hadn't modelled, we did now. I agree it is helpful to look at.

You can see this is the base case assuming 30 per cent control but 70 per cent of the stacks. This is the best case assuming 80 per cent control of 70 per cent of the stacks. There is no difference in the first high. If you look at the second high, we have a 12.7 versus 11.9, it's essentially the same answer. Why is that? Well, if you are only controlling it 70 per cent of the time the maximum that would occur is 30 per cent you are not controlling. So if we had done all the rest we would have seen some variation within this range here, the second high. The first high would probably have all been the same. We do not disagree it would have been perhaps useful, there just wasn't time, it wasn't feasible to do that in the allocated schedule.

I do want to clarify just two points in the staff report that EPA produced. These are minor points of clarification but it may be helpful.

The analysis here is showing the 99.99th percentile. This particular percentile is based up straight CALPUFF results, it is all ours. So our three kilometre grid for the modellers is all ours. When we do our Monte Carlo that is a smaller assessment, a smaller grid. But what we have done in this is we completed the graph. They did not have coverage -- they had coverage over the water but not within the land area. We've shown that in here so they do have that full coverage. What this is showing - and I do want to point this out - that at this level it is approaching the one isoline does cross the boundary somewhere in the southern area down here where the boundary is quite short.

Now, this particular example here is a new assessment we've done in response to Mr Todoroski's appropriate point that we are not showing the ships alone. This is one example we have and we do plan on doing more. But this is showing the 100th percentile actually.

[11.25 am]

Monte Carlo based 100th percentile, just running three years. This is not a full 24 year long run. But this is showing the 100th percentile over the water, over land, it's not based on a lot of hits, as he appropriately pointed out. You will only have statistically six ships per year so this is 18 ships. You don't have a lot of overlapping worst case meteorology and worst case emissions. If we run 96 years you will, but this just shows an example of that for the record.

Now, there are some minor points for the modellers that I want to raise. I don't want to spend a lot of time on this because it will probably only be appreciated by the modellers but for the record I did want to make these points. There are some issues that were very difficult to get across in a report. Obviously we did not clearly state enough.

The first point is we did use a random seat, that every run is different. If you run the model a 100 times you get 100 different emission files, 100 different results. So it is true Monte Carlo. Secondly, the distribution we are showing R for non-zero, index only. You can't take the full year and try working it out the other way because that's not how we did it. The third point is we had a table in our original for the near field analysis and we showed the probabilistic analysis for that in terms of percent, relative to the 70 per cent, 30 per cent assessment. It's not 80 per cent control or 60 control, it's what the values will be relative to the 30 per cent, 40 per cent assessment. That was confusing. In the tables we're presenting now we are showing the actual numbers so I apologise for that confusion, that is not what we intended.

Lastly, we did use a graphical user interface when we were doing CALPUFF, it is a great way to create initial files. We certainly have a full capability to model anything anyway we want, there's no limitation from that. I wanted to make sure also that point was clarified.

Now, in terms of the current status of the STELs based on the modelling done so far, what I can say is the one hour is STEL is met at this point in time at the boundary. I will also show that my recommendation is that if the existing buffer zones were to be maintained that in my judgement upgraded methyl bromide measured data is recommended in order to have sufficient confidence that the buffer zone is being met. Right now I don't think the measured data is sufficient and I will give reasons why.

Now, again, I want to emphasise this point I did show before but I think it's important to raise this one last time. That to meet the methodology order I agree it's useful to have upper boundary assessment, I think it should be available to the DMC but the decision-making, from my interpretation of the methodology order, is that the probability occurrence and magnitude of each effect needs to be considered. That's where the Monte Carlo does come in and it's very helpful in meeting that need.

So in terms of the annual average, I did want to show an annual average -- you will see in the report that there is a small area to the southern portion of the boundary where the standards has been exceeded. It is not within .0013. There are two important points to interpret that. One, is that this area is commercial property. There would not be annual exposures in this property. Point number 2 is that the way we did our Monte Carlo to be conservative in the short term, more conservative in the annual basis, we're emitting 22 per cent more mass than needed. If you were to reduce the mass by 22 per cent these numbers here would be approximately within the standard at that point in time. That assessment could be done in the final analysis if deemed necessary.

The other plot was the one hour plot. The one isoline is shown in here with the boundaries in green hash marks. It doesn't cross that line here. We didn't have a full enough receptor grid to show the rest over here, we should and we can in the final assessment to show to the west what the occurrences are as well.

Now, to conclude my rebuttal testimony I did want to talk about recommendations. These are my personal recommendations. I am speaking during STIMBR's time, I hope they agree with my recommendations but these are what I think should be done.

[11.30 am]

Again, it may seem that the modellers have very different viewpoints on certain topics. I don't agree, I think we don't, I think basically the modellers involved here in terms of that have provided review comments, which would include Ms Barclay, Mr Todoroski and myself, we have worked together on the expert panel. I think we all respect each other's skills and I believe that we can make accommodation to the points they have raised and I believe we can come to consensus. I think that should be done and a package given to the DMC that is complete work. That complete work would be to resolve these issues.

I think to get that done in the most efficient manner I would think is a two-step process. Mr Todoroski has produced upper bound assessment, we have produced Monte Carlo assessment. My recommendation is Mr Todoroski and my staff collaborate in a sense of making sure that Mr Todoroski can see our files or programmes, how we are operating, how we producing the data, answer all of his questions and accommodate his issues, what he thinks could make the modelling better and come up with a consensus approach to doing the modelling. I would like to have that approach reviewed by the expert panel so we can reach consensus and produce a modelling package that will be acceptable for all parties. Then take that package back to the DMC. I think it would be in a much better place than you are right now.

There are things we can in that reassessment. I would recommend focusing only on the core scenarios, not to kind of shotgun this but to focus on what's really important. To separate the ships in log stacks, it's true that should be done, that should be done in the final assessment. To show the 99.9th percentile, I think we should show it that way. We should show it for both non-zero sources, as we have, as well as to be consistent with the recommendations of the New Zealand guidelines, which are based upon all hours.

I think we should base the distributions on a longer period to accommodate the concern about the more rare events with the ships and capture those events in the analysis. Finally, which is a modelling-related issue, we should co-locate the analysis for the deterministic modelling, which would make the assessment easier to interpret.

In closing, I did want to talk about a couple more points. I think I have addressed these sufficiently, except perhaps the last point. Ms Barclay has appropriately raised the point: what about peak exposures? I think we should address that in the final assessment. I think that can be done. I would like to talk with the expert panel about the means of using the hourly assessment as one way to approach that, using established peak to mean ratios at the boundary to assess meteorological impacts at 15

minutes versus an hour and to make conservative assumptions about when emissions are released, perhaps within the first 15 minutes totally, to come up with what could be considered a conservative estimate of 15-minute exposures.

I do want to point out, though, that when you do that type of assessment, I'm not a toxicologist but what generally happens in this kind of analysis is that if you reduce the averaging time by a factor of four, the acceptable air concentration with typical uplift manufactured for. So it may not make a huge difference but I think that we should accommodate that point. It's a valid point. I think that should be done for completeness.

Again, I think that the modelling should be informed by the measured data, as (inaudible) stated. I believe that we can be reasonably consistent with the analysis; we are now and, with the refinements discussed, may be even better.

These are mainly points I'll discuss briefly. The concern was raised that when you have three monitors at the boundary you might miss the plume in some cases, and Ms Barclay is correct, that can happen. That can primarily happen when you have a condition like at night and you have more calm winds, you have light winds and variable winds. It can be much harder to capture that plume. During typical daytime conditions when you have sunny conditions especially, you have pretty vigorous growth of the plume and vigorous mixing to get more spread out and more easily captured, but there are times when you might need a fourth monitor. Maybe there's times when you have light winds and you need more than four, I don't know, but I think you do want to capture those plumes and that point is well taken.

[11.35 am]

Finally, what can be done about monitoring? Mr Weiss very appropriately stated that the canister monitoring is pretty expensive, perhaps prohibitively expensive to the point where the samples can't be done on a regular basis. My point is there are other ways to sample that we've used a lot in the US and I think could be helpful here. What I'm referring to here is the fact that $800 a sample is too high. You can't get many samples that way. What we've found to be effective in the US is sampling tubes. We use sampling tubes in all the studies we've done and I can say we've done 50 or more emission studies that go to the US EPA, where we use sampling tubes as a basis to do emissions assessment. We get extremely good results with them and so long as you validate for the method you're using -- so if you do methyl bromide in an environment like a port where there's higher community, you want to make sure you're validated to that condition and that use but if you do, you can get your sampling costs cut down

by a factor of three or so. Not hard to take the samples. The staff at Genera could take those samples, they get analysed in a laboratory and to me it would be the way to go. We have collected, I would say, over 100,000 samples over the last 20 years with various types of glass sampling tubes and have gotten excellent results with those.

This is an example from a study that was done by the California Department of Pesticide Registration where they did a study using Summa canisters for methyl bromide specifically and then compared that to charcoal samples. Charcoal works pretty well for methyl bromide, not for all chemicals. The one to one correspondence line is shown; it's not bad correspondence. Again, you're in a more humid environment. I would expect you would need further method validation, but if it were my monitoring programme I would definitely get away from canisters. We've never used canisters.

We've gone through these points already; I'll skip on. That's the end. Thank you very much.

MR SLYFIELD: Thank you, Mr Sullivan. I'm in your hands, Chair and Committee members, whether you have any questions for Mr Sullivan.

QUESTIONS

DR BELTON: Thank you very much, Mr Sullivan. Just one question. I'm not sure whether it's really within scope or not, but you were finishing off talking about the sampling tubes versus canisters and so on. What about, if I understood Mr Weiss correctly, the real-time sampling instrument? Have you experience with that or that sort of monitoring and any comment on that, please?

MR SULLIVAN: We have not used the FTIR system. It certainly is a valid way to monitor for methyl bromide. I would endorse that as well as another way forward. I think my concern is that relying only on TVOC, total volatile organic chemicals, that it doesn't provide sufficient information. It allows for the interpretation that it's all methyl bromide when it's not, and it raises questions about what's being captured relative to methyl bromide. So whether the FTIR or glass sampling tubes or a combination of the two, I think a change would be helpful to both STIMBR and Genera as well as all other parties.

DR BELTON: Great, thank you.

CHAIR: Mr Sullivan, you referred to a recommendation for additional expert conferencing. You'll appreciate, of course, that we've just seen the detail within your presentation, which I hope you'll get through to us as soon as possible so that we can move quickly into deliberations. My question to you, and you may well have already covered it, is how

would the additional expert conferencing be different to the conferencing that's already occurred? Like, will we produce markedly different results or would you produce markedly different results?

MR SULLIVAN: I don't think the results of the modelling would be markedly different. I think that it would provide perhaps more confidence to the DMC and it would address the issues raised by the other two experts, especially the point raised by Mr Todoroski regarding the ships. If there's concern about the ships and the infrequent nature of those ships being captured by the Monte Carlo, I would think that that would be helpful. Certainly, the scope of that reassessment could be limited and dictated by the DMC to be the areas of greatest interest. I don't think a full reassessment is needed. It would be a focused reassessment to provide whatever confidence improvement is needed to go forward.

[11.40 am]

CHAIR: Thank you. One more question. You talked about the 98th and 99th percentile and so on, and I appreciate how that relates to modelling. Is that something that would also be used in monitoring so that 99.9 per cent of results be above or below a certain figure, whatever the case may be?

MR SULLIVAN: That is used in state and government programmes where they monitor all the time, where they're measuring, say, a sulphur dioxide every hour of the year. They can use a standard like that and they do. In this context where, let's say, every day TVOC is being used for most of the denting, but for the largest denting let's say for the sake of argument they use glass sampling tubes or FTIR and they get a more clear assessment of direct data. That wouldn't be enough data perhaps to be able to cover the 99.9th percentile really well but perhaps if done daily there'd be enough samples to support it. You couldn't go much above 99 and have enough samples to accommodate that, but in the monitoring world there are artefacts that occur too. That's why those standards that I showed are not set at the 100th percentile because in most countries they determine compliance based upon ongoing monitoring and they know that sometimes things happen. There might be an upside condition occur, anomalous smoke occurs or whatever, that affects the monitors. If they were to regulate at the 100th percentile, one year they're in compliance, the next year they're not. It would be a totally unworkable programme.

CHAIR: Okay. Thank you for your time, Mr Sullivan, we appreciate it, and back to you, Mr Slyfield.

MORGAN SLYFIELD PRESENTING

MR SLYFIELD: Thank you, Mr Chair. We're on the home stretch now and STIMBR very much appreciates having the time to be able to present this reply. I'll be as brief as I can be but there are a few matters that I need to work through. Can I signal that it's not my intention to provide you with these submissions in a written form, with one exception, and that's in relation to the scope issue that has been raised? I have put those into a written form and I'll take you through the submissions that I have on that, but I'll also provide you with that document in writing so that the position is very clear.

The first thing I wanted to do was just touch on very briefly a point that has been made about how we came to be here in this modified reassessment, and that is the oddity that has been noted by some submitters that we seem to be here because we use more methyl bromide than we did before. I'm sure the Committee is aware that that was part of the grounds decision that the EPA made.

The point that I need to make about that is that although that was the basis, as I understand it, on which the EPA decided that there were grounds for this modified reassessment, those were not the primary grounds on which STIMBR sought a grounds decision. Rather, STIMBR's application for a decision on the grounds was that there needed to be a reassessment of the recapture controls to take account of the science and technology that had been researched and developed since 2010.

The next point I want to come on to is the Montreal Protocol. The documented sections of the Montreal Protocol and its decisions provided in submissions are especially important because they demonstrate that the protocol was ultimately pragmatic in discussing the QPS uses of methyl bromide. None of the Montreal Protocol decisions or directives include imperatives such as "must" or "have to" or "shall" and "shall not". To the contrary, the protocol took the necessary approach of recommending, urging and encouraging the parties to manage and, when economically and technically feasible, replace QPS applications of methyl bromide.

[11.45 am]

The key phrase there is "when economically and technically feasible", which was written with the understanding that any reduction in QPS of methyl bromide must be based on sound scientific and economic principles that provide for quarantine security and facilitate continued trade. It was not the intention of the protocol to stop international trade through a compulsory reduction in QPS uses when no efficacious alternatives were available.

On this, I'll note that that was put by Ms Barry-Piceno to one of the witnesses during the hearing, that the US Government had, as I understood her proposition, banned the use of methyl bromide in almost all instances. I simply draw the Committee's attention to the evidence it has before it, including that of Dr Morgenstern, which clearly demonstrates that whatever it was that the US did back in 2005, it remains the highest emitter of methyl bromide in the world.

Perhaps just to close on the methyl bromide point, I could say this: the indirect benefits of reducing methyl bromide emissions are not in dispute. However, STIMBR maintains the position advanced in opening, that those benefits cannot be quantified with enough precision to be a proper basis for selecting one possible recapture standard over another.

The next topic I want to touch on is the modelling and you've heard a lot of evidence about modelling, including just now from Mr Sullivan. STIMBR notes that Mr Todoroski, Dr Todoroski, when he presented, said that he had no technical issues with SEC's modelling. His firm, TAS, had taken the same weather data, run its model and made a like for like comparison and Dr Todoroski said their model produced the same raw data as the Sullivan model, so there's not a technical issue with the model. The issue, as I said to you in opening, is how the modelling is interpreted. Dr Todoroski also said, helpfully, that he had no fundamental problem with using a Monte-Carlo approach. It's a perfectly valid approach to use and in his view we should have been looking at the 99.9th percentile because that is what is the Good Practice Guide directs.

I won't dwell on this point, because Mr Sullivan has already taken you to it, but you will recall the slide he showed just a few minutes ago showing recommendation 53, which is the relevant recommendation from the Good Practice Guide, and doesn't just say that the 99.9th percentile should be used. It says that specifically in relation to a scenario where one is modelling for all hours of the year. In other words, that's an appropriate approach for constant source emissions more so than intermittent sources, such as we have here, and in the case of this intermittent source Sullivan has taken a conservative approach by discounting all of the non-zero hours.

From STIMBR's perspective, if the Good Practice Guide is treated as more than mere guidance, if it is applied to the letter, treating the 99.9th percentile as a strict requirement, then its other provisions must be equally strictly applied. It is not appropriate to cherry-pick some of the recommendations from the guide and ignore others. If the 99.9th percentile is strictly applied, so too must the model be run for all hours of the year, including those when no emissions are occurring. On this basis, the result would be values substantially lower than the values

Sullivan has reported and well within compliance of all existing TEL controls.

In terms of the modelling, I think there is a useful level of agreement between the modellers that it is sensible for there to be a control on opening of ship hatches sequentially with a gap in between and that this could be incorporated into controls that the DMC might be minded to impose.

[11.50 am]

Mr Sullivan has made plain his view is that there is also an opportunity to use ongoing monitoring to validate the modelling in practice. It would be open to the DMC to impose a control of that sort and Mr Sullivan has indicated that there may be more modelling work that could assist the DMC to reach an informed decision on those matters.

I want to briefly discuss health issues. You have heard from only two health professionals during the course of the hearing, being Dr McLean and Dr Pemberton. STIMBR's position on health remains unchanged since I opened for STIMBR last Tuesday, which is to say there is no new evidence establishing a robust link between methyl bromide and health effects that were previously unknown. Dr McLean's evidence is consistent with that. He says there is no conclusive evidence of carcinogenic effects of exposure to methyl bromide and he said the other main concern with methyl bromide has been degenerative neurological conditions, such as motor neurone disease, but again, his view was there is no strong evidence. The last part of Dr McLean's evidence was that he talked about his own study and properly acknowledged that it relied on self-reporting and said, "I would be shot down in flames if I tried to report it too strongly".

The only other health expert you have heard from in this matter is Dr Pemberton and STIMBR continues to rely on Dr Pemberton's assessment. It is the only evidence before you that has examined the likelihood of health effects associated with exposures to methyl bromide, as estimated by Mr Sullivan's modelling. Related to this, I want to talk briefly about worker safety. Mr Weiss, for Bay of Plenty Regional Council, and others have raised concerns about exposure of workers within the port. Mr Weiss in particular compared the operation of the WES and the operation of the TEL and seemed to suggest that the WES is not adequate to protect worker health. With respect, Mr Weiss is not a health professional or a toxicologist or an occupational hygienist and his views on this matters cannot be given weight.

In addition, I say the WES and the TEL, as the Committee will know, are different controls for different purposes. TELs are to protect public health generally, but within the buffer zone of a fumigation, they do

not apply. There the WES applies specifically to protect worker health. The WES is not based on acute exposure, it is based on chronic exposure, eight hours a day, five days a week over a working career. The WES threshold, which is set by WorkSafe, is regularly reviewed and has not changed. It is not the subject of this reassessment and, in my submission, in the absence of any expert and credible evidence to the contrary, you are entitled to assume that the WES is doing the work that it should.

You have heard from a number of submitters, for example, Mr Beech, who are passionate about worker safety and evidently hold strong views about the effects of methyl bromide on workers. No one who listened to Mr Beech's heartfelt submissions would question that those views are sincerely held. Your task, however, is to evaluate the science. There is no scientific evidence that supports the conclusions that Mr Beech asked you to draw.

On a related note, Ms Barry-Piceno expressed her view that there is a lack of rigour by those who hold the consents at Port of Tauranga, namely Genera, and her colleague, Mr Sharp, told you he did not accept that workplace standards have been complied with at Port of Tauranga. He asserted that while Genera's workers are monitored, none of the other workers on the port are. On these matters, STIMBR relies on the evidence of Mr Hill, who has described in detail the way in which the two controlled zones, being the risk area surrounding the fumigation and the buffer zone out to the boundary, are managed by Genera's workers. Further, it is not your role to assess whether the current fumigation operations at the port - or indeed past fumigations at the port - have complied with the law.

[11.55 am]

There are a multitude of regulatory requirements applying at the port, including the terms of Genera's resource consents, provisions of the Resource Management Act and health and safety legislation, to name a few. If there have been breaches of regulations, then those are matters for the respective regulatory agencies to pursue. EPA controls under the HSNO Act, like all other forms of regulation, must be complied with and compliance is enforceable by law. When setting new controls, you must consider their effectiveness on the assumption that they will be complied with or otherwise that compliance with them will be enforced.

I'll note there that Mr Sharp also referred you to the Environment Court's decision in the Envirofume case and suggested to you that you might take some guidance from it. In my submission, that is an RMA case, not a HSNO decision. It involved a consent application, not a modified reassessment and the evidence that was before the

Environment Court is not now before you. In those circumstances I submit it is of no relevance to your assessment.

I want to talk about buffer zones next. Firstly, I want to try to answer the question about what buffer zones are already in place and this is because WorkSafe's presentation may have created some doubt in the DMC's mind. It seemed to be suggested that under the Health and Safety at Work (Hazardous Substances) Regulations that if there is any level of recapture being applied, then the requirement for buffer zones disappears.

I do not agree with that interpretation of the regulations and I think it is important for you to know why, and that is not because you can do anything about altering the regulations but, of course, you can take account of controls under those regulations and how they operate alongside HSNO controls in the management of adverse effects.

In the case of buffer zones, the confusion arises because of the wording in regulation 14.38. 14.38(1) says:

"A PCBU with management or control of quarantine or pre-shipment fumigation using methyl bromide must set a buffer zone for each fumigation that is equal to or more than the relevant distance in table 4 in schedule 18."

That on its face is very clear but at (4) of the regulation there is the further statement:

"Despite subclause (1), the requirement to comply with the buffer zone distances referred to in that subclause does not apply to fumigation where recapture technology is used."

As you heard from Mr Moenboyd, quite correctly, recapture technology is defined differently in the regulations than it is in this setting. Effectively, any amount of recapture will suffice. So the operation of (4) on to subclause (1) that seems to create the allowance to not set a buffer zone. However, in my submission that must be read alongside regulation 14.39 because this regulation is equally clear and contains no exemption relative to whether recapture is used or not. It says:

"A PCBU with management or control of quarantine or pre-shipment fumigation using methyl bromide must ensure it is not used in a manner that results in a concentration of the substance in the air at the boundary of the buffer zone that exceeds the tolerable exposure limit set for methyl bromide."

And in no way do the words in 14.39 depend upon regulation 14.38 for their meaning because "buffer zone" is defined separately within the

regulations at 14.32. It is that definition which replicates the reference to the table, being table 4 in schedule 18, that operates within regulation 14.39 to ensure that the buffer zone ascribed by the regulations must be complied with in terms of the TELs.

[12.00 pm]

Now, I want, in relation to buffer zones, to answer a question, if I can, that was asked on a few occasions by members of the Committee, which is whether or not you can in fact consider buffer zones or impose controls in relation to buffer zones. Indisputably you cannot change the buffer zones that are in the health and safety at work regime. That is legally the position and, in my submission, that is also reflected in the chief executive's decision to proceed with the modified reassessment. At this point in time, there are no buffer zone controls set by the EPA under the HSNO regime. Could the EPA set a buffer zone control? In theory, yes, it could.

The fact that there are buffer zones provided in the health and safety at work regime does not preclude the EPA from setting a separate buffer zone control, but here there are at least two relevant constraints. The first, it needs to be based on the evidence and in this case there are no measurements, in my submission, that support buffer zones being as broad as the EPA has proposed in its staff report. Secondly, it has to be effective and in this case the buffer zones proposed in the EPA staff report are so large that no port in New Zealand could possible give effect to them. If buffer zones that large were imposed, that would effectively prohibit the use of methyl bromide altogether. For those reasons, STIMBR cannot support buffer zones like those proposed in the staff report and it remains STIMBR's position, based on the modelling evidence that it is relying on and based on the evidence of Dr Pemberton that it is relying on, that there is no evidential need for the buffer zones to be any larger than they already are under the health and safety at work regime.

The next topic I want to address is recapture standards. STIMBR started this application because it knew a 5 part per million recapture standard could not be achieved. That is not really contested here. The real focus for your consideration is what the standard is that should replace it. As you know, STIMBR began this process thinking that in respect of log stacks the standard should be 80 per cent. STIMBR had done two validation tests of Genera's equipment that produced figures in the 80s. Since then, Genera has undertaken more testing and has found that those numbers cannot be consistently achieved in an operational setting. STIMBR is not Genera and STIMBR does not have unlimited access to Genera's data. All STIMBR can do is act responsibly with the data that it has.

On the basis of the data STIMBR now has, STIMBR cannot continue with a request for an 80 per cent recapture standard in relation to log stacks. I will go through the three fumigation enclosures, but before I address those I wanted to make one observation about the proposal that Mr Weiss was advancing to you that there should be an absolute concentration approach for the recapture standard. In STIMBR's submission, that is not a workable approach. A percentage approach is based on methyl bromide recaptured in proportion to the methyl bromide remaining in the enclosure at the end of the fumigation period. The amounts, as you've heard, can vary considerably. Setting a single numerical concentration to be achieved would only be workable if it was based on the highest starting concentration of methyl bromide, which would in fact make it less effective for reducing emissions across all fumigations.

[12.05 pm]

So, for shipping containers STIMBR maintains the position that it outlined in opening. Further, all the evidence you have heard supports a conclusion that the best recapture efficiency available for small scale fumigations - shipping containers or similar - is 80 per cent. For ship holds, STIMBR also maintains the position outlined in opening and says all the evidence you have heard supports a conclusion that there is no technology on the horizon that will enable any amount of meaningful recapture from ship holds. To encourage all stakeholders to strive to do better, STIMBR supports the setting of an aspirational standard of 50 per cent to apply in ten years' time.

That brings me to log stacks. The evidence you have heard is that recapture varies in efficiency between 30 per cent and 80 per cent. This was, as you know, the basis for STIMBR's revised position covered in my opening submissions that the controls could not be set higher than 30 per cent because more than that could not be reliably achieved. In the course of the hearing you have heard from Genera who have told you that on average they can achieve 50 per cent to 60 per cent recapture efficiency from log stacks. STIMBR considers that the DMC can use that information to fashion a more aspirational control that requires a minimum of 30 per cent recapture from all log stacks and an average of 55 per cent across all log stack enclosures. The DMC has shown an obvious interest in knowing whether any party can tell the DMC when 80 per cent might be achievable and the answers have been consistent but probably frustrating: for log stacks, no one knows.

Having said that, Dr Armstrong's view offered in response to questions from Dr Belton was that with adequate research improvements can be made. Further, it may be possible to set the controls to require incremental improvements over time. STIMBR would support controls requiring incremental improvements over time provided those

controls are set so as to be achievable. In STIMBR's view, the information presently before you is not sufficient to enable you to fashion a control, but STIMBR says you have the authority to obtain further information to assist you in making your assessment.

That brings me on to the legal question around the scope of STIMBR's change of position and this is the part of the submission that I will be providing to you in a written form once I have completed. The issue has arisen because the application form that STIMBR lodged with the EPA in March 2019 requested a change of the definition of recapture control to require at least 80 per cent recapture but STIMBR has now indicated that it seeks the definition to be changed to require at least 30 per cent recapture. STIMBR says that this change of position is within scope of the reassessment process and fundamentally this is because the scope of the process is not set by STIMBR's application document but by the EPA's decision to run a modified reassessment, what's known as the pathway decision that was made by the chief executive of the EPA on 12 April 2019.

STIMBR did not control whether this proceeded as a modified reassessment or as a full reassessment. That was a matter entirely within the discretion of the EPA under section 63A. The Act provided STIMBR with the ability to lodge an application; that's in 63(1). Whether that application proceeded as a full reassessment under 63(2) or as a modified reassessment under 63A was up to the EPA. In this respect, the process we're now in is not like any RMA consent process and I raise this simply because you were invited to compare where we are now with happens in the RMA space.

[12.10 pm]

In an RMA setting, the application is the main reference point for assessing whether a refinement made by an applicant is within the scope of the process. Here, by comparison, after STIMBR made its application, the EPA made a decision for which there is no RMA equivalent, the decision to proceed under the modified reassessment procedure. This is significant, because what STIMBR asked for and what the EPA decided to proceed with are not the same thing. So STIMBR's application had said this: it has asked to reassess the controls that apply under decision HRC08002 that relate to the recovery of methyl bromide when used as a fumigation for quarantine and pre-shipment purposes. It went on:

"We ask for a section 63A modified reassessment to provide clarity regarding the current controls, specifically to reassess the feasibility of recapture technology and refine the controls to firstly: [and there were a list of three bullet points] require recapture of 80 per cent of methyl bromide remaining at the end of fumigations; [the second bullet point]

extend by ten years the deadline for achieving recapture from ship hold fumigation; [and the third bullet point] make related refinements to strengthen buffer zone requirements at the completion of recapture."

Now, I read that word for word because it stands in comparison to the EPA's decision to proceed with the modified reassessment, where the chief executive says, and I quote:

"I have decided, under section 63A(1) of the Act, that the EPA will conduct a modified reassessment of methyl bromide. The specific aspects of the approval to be reassessed are: [first bullet point] hazard classification; [second bullet point] benefits; [third bullet point] controls on the use of methyl bromide within the scope of the Act and excluding those within the Health and Safety at Work regime."

There are, in my submission, a number of obvious differences between what STIMBR asked for and what the chief executive decided. STIMBR did not ask for hazard classification to be reassessed, nor for benefits to be reassessed, yet both of these are explicitly made part of the reassessment by the chief executive's decision. Conversely, not one of the detailed proposals for refinement of the recapture controls that were in STIMBR's application and which I read out a moment ago were restated in the chief executive's decision. Instead of those details, the decision refers simply and broadly to "controls on the use of methyl bromide".

Consistent with that breadth, there are now a number of suggestions before the DMC that were not explicitly sought in STIMBR's application and I will give you four examples. The first: there is a recommendation in the EPA science memo to make changes to the hazard classification of methyl bromide. The second, there is a recommendation in the EPA staff report to impose additional controls for monitoring and reporting fumigation activities. The third, there are recommendations in the EPA staff report to set a new recapture deadline for recapturing from log stacks to allow 24 months' lead time for the construction and installation of recapture equipment. Fourth, there is Bay of Plenty Regional Council's suggestion in its presentation at the hearing that there be a control imposing a cap on the number of ship hold fumigations that can occur in a given period of time.

If the scope of this reassessment were to be limited to what STIMBR explicitly requested in its application, then all of those four examples would also be out of scope. That would impose a significant restriction on the DMC's power to consider a range of regulatory responses to the information that comes to light during the modified reassessment process and would not be consistent with the breadth of the chief executive's decision. There is nothing in the chief executive's decision to indicate an intention to tie the DMC's hands in that way.

[12.15 pm]

Furthermore, the information about what levels of recapture are achievable is continuing to evolve. When STIMBR commenced its request for a modified reassessment 17 months ago, it based its proposal on the best information it had. Since then, better information has come to light. Had STIMBR not adjusted its position to reflect that information, the reassessment would have stood little chance of delivering controls that could actually be achieved in practice and this entire exercise would have been futile.

For all of those reasons, STIMBR maintains that it is within the DMC's jurisdiction to evaluate STIMBR's revised position alongside the positions of all other participants in this process. If the DMC concludes that the evidence supports STIMBR's proposed controls and that imposing those controls will satisfy all the relevant statutory tests, then it is within the DMC's jurisdiction to grant the reassessment and vary the controls in the manner STIMBR is seeking. Now, I acknowledge it is important that the DMC is satisfied that the process has been fair and in particular that no unfairness arises due to parties having insufficient time to express a position on STIMBR's revised proposals. As I stated last Friday, STIMBR would support the DMC if it were minded to provide all parties with a period of time to express a position, for example, a two to four-week period, as Ngāi Tahu suggested it would need to consider the change.

Now, plainly there are a number of submitters - and the Fumigant Action Group is an example of this - who will say that an extension of that sort will not be adequate to address this issue. They may say that they would need much more time to obtain additional assessments or call new evidence. That position must be considered in the context of the existing hearing procedures. Under those procedures, no party had any notice of the evidence that would be led by any other party or of the various assessments by EPA staff until ten working days prior to the hearing. STIMBR, as the applicant, had no insight whether EPA staff recommended approving or declining the application and, if approving, under what revised controls until ten working days prior to the hearing.

Implicitly, ten working days was considered sufficient time for participants to be able to evaluate that body of information prior to the hearing. STIMBR submits that a two to four-week period to allow parties to comment on its revised position would be proportionate and consistent with the hearing procedures.

Finally, STIMBR is seeking a reassessment so that the recapture control can be set at a level that is achievable with existing or

foreseeable technology. I return to the central question that I put to you in opening and I maintain that this is the central question for this application, and that is whether there is a recapture control (a) that is achievable; (b) that will not compromise the health and safety of people and communities; and (c) that will uphold New Zealand's international obligations. STIMBR submitted in opening that there is and that remains STIMBR's position now.

Finally, if at the conclusion of the hearing the DMC considers that there is uncertainty arising from absence of information or from inconclusive or contradictory information or information from an unreliable source, then it is open to the DMC to request further information from STIMBR to address those matters, and indeed from other parties. If the DMC should find itself in that position, then STIMBR would urge the DMC to consider requesting such information, particularly given the undoubted significance of this decision in terms of the realisation of benefits for New Zealand. Those are the closing submissions for STIMBR. I'm happy to answer any questions that the Committee may have.

[12.20 pm]

QUESTIONS

DR PHILLIPS: Thank you, Mr Slyfield. I just had one question. I kind of have a second one; I might ask it. The first question is just a simple one, and that's based on just my understanding is that your proposed recapture percentages, minimum 30 per cent and average 55 per cent across all log stacks, is that based purely on what you perceive technology can achieve as opposed to incorporating some of the other actions that we've heard about over the course of the last few days, for example, from Genera?

MR SLYFIELD: I'm not entirely sure I understand what actions you're referring to, Dr Phillips. Are you able to --

DR PHILLIPS: For example, the dosing to concentration. You will recall that Genera had a proposed strategy which included a range of activities or things that could be undertaken to reduce the amount of methyl bromide. For example, as I say, the dosing to concentration was one which I think they calculated could result in a 12 per cent reduction in methyl bromide being used. That's the sort of thing I'm talking about.

MR SLYFIELD: Yes, and I can answer your question and I understand that. You're right, the proposal being advanced by STIMBR does not incorporate any of those additional improvements that might be possible.

DR PHILLIPS: Okay. Did I get this right, that you were saying -- I wrote down STIMBR supports 50 per cent recapture target to be applied in ten years' time. Is that right? You're saying that in ten years' time you will recapture 50 per cent?

MR SLYFIELD: That's in relation to ship holds specifically, Dr Phillips, yes.

DR PHILLIPS: Oh, in relation to ship holds, thank you, just to clarify that one. I guess another one - I'll just challenge you on this one - was this question about numerical value, a concentration-based target versus a percentage target. I understand your point but I was just wondering. My understanding is that certain markets define a specific dosage requirement at the start of the treatment process and, therefore, if a target, say, of 50 per cent was set, then obviously there's a concentration which relates to the starting concentration. So, could that not be the target, sorry, as a concentration rather than as a per cent, so 50 per cent of the target starting concentration? Sorry, I'm getting myself confused here. Do you understand that?

MR SLYFIELD: Yes, I think I do and I think --

DR PHILLIPS: It's a bit messy.

MR SLYFIELD: I think the difference there, Dr Phillips, is where there's a difference between the concentration that's required to be achieved for the fumigation to be effective for phytosanitary purposes, which is the one that's prescribed by the trading partner, effectively, and the concentration that may be left at the end of the prescribed fumigation cycle, which is highly variable. So, I think it would be possible potentially to have a control that looked at the dosage figure of a trading partner and used that as its basis, but it's my understanding that that would not take advantage potentially of the variations in reduction that naturally occur during the course of the fumigation, such that if one instead uses the residual amount that's in the fumigation enclosure at the end of the fumigation cycle, that becomes a reduction that, in effect, you're banking for the purposes of the recapture control. I'm not sure if that has been a clear answer.

DR PHILLIPS: No, no, that's fine. I guess just one last question is this comment about STIMBR, when they wrote their application and they chose the 80 per cent, that was based on the best technology at the time, their understanding of what technology could achieve at the time. I understand that's changed, that's fine.

[12.25 pm]

I guess my question, and perhaps I'm not sure you can answer this question, but presumably when the decision was made in 2010 to set a

5 ppm target for 10 years, that was based also on what the understanding of the technology could achieve. Would that be a fair statement, do you think?

MR SLYFIELD: It's not a statement that STIMBR is able to agree with, I'm afraid. STIMBR has a very different perception of what the information was that was available when the DMC set that, and obviously I'm not referring to this DMC but the DMC that heard that matter, set that standard.

DR PHILLIPS: Okay. Thank you very much for that. No further questions.

CHAIR: Kia ora, Mr Slyfield. I had a couple of questions but you answered them in the right of reply. You talked about relying upon evidence or seeking information regarding the setting of recapture controls that are achievable and so on. One thing we need to turn our minds to is this issue of whether we address the issue of stepped improvements over time and how to rely upon that. So, my question is how would you suggest the DMC goes about getting that information, given, as you are well aware, how much information DMC already has to hand and the lack of certainty that we currently believe exists around setting that stepped improvement?

MR SLYFIELD: Yes. I think the best answer I can give is that the DMC is uniquely placed in this situation to identify what information it thinks it needs and to go after it. That puts you in a different position than STIMBR is in. It puts you in a different position than the EPA staff have been in, in terms of coming up with their assessment.

Now, I would say that that hopefully puts the DMC in a position where once the 6,100 pages of existing information are assimilated and there is at least some clarity about what questions the DMC needs some further help answering, that targeted requests for further information from participants in the process may be able to advance the understanding in a way that has so far been elusive.

I take your point, Mr Chair, that you have a vast amount of information in front of you and yet a considerable amount of uncertainty. I think the short version of the answer is you're now perhaps more appraised than any other party has ever been in this long sequence of what those remaining questions are, and it is within your ability to go after those pieces of information you need.

The only thing I would add to that is from STIMBR's perspective the important part of that is that the information is obtained from parties who are familiar with what is, in fact, achievable. Inescapably here, that puts a fair amount of emphasis on Genera's role in all of this.

CHAIR: Thank you for that. With the inevitable task of adding to that pile of paper, your right of reply and the written portion you're providing and the presentation we've received is important, so are you able to give any indication of when we will receive those?

MR SLYFIELD: I can send through the written portion within the next five minutes and that can be uploaded on to the website for everybody to pore over.

CHAIR: Thank you, I think, Mr Slyfield. Well, on that note, we have reached a point of pause and adjournment with our hearing. Before I hand over to Mr Julian Jackson from Kaupapa Kura Taiao within the Environmental Protection Authority to offer our closing karakia, we'd really like to acknowledge again everybody's participation on behalf of the DMC. Are you done with the questions? Yes. We do thank you for all of your participation.

[12.30 pm]

We're now left with the unenviable task of filtering through that and coming up with a decision on the matters before us. So, we will consider that over time and advise what our decision is in writing. That may include issuing further directions and minutes as required, including any further directions or minutes as it may relate to the applicant's submission for a recapture standard of 30 per cent. I don't want to flag that that may or may not occur, just to say that it possibly could occur. On that note, we will adjourn the hearing now.

(Māori content - will be inserted when script finalised)

CHAIR: So, I'd really like to acknowledge those who have participated in this process from throughout the world and certainly within the country. At the end of the day, we're confident that we will reach a place that is the best for both the environment, for the community and for those who live within it. That's inclusive of those who are involved in the business of our community.

(Māori content - will be inserted when script finalised). Tēnā koutou katoa.

Mr Jackson, in your hands.

CLOSING KARAKIA

MR JACKSON: (Māori content - will be inserted when script finalised)

Just to acknowledge the great efforts of the DMC. It's a controversial topic, I acknowledge that, everyone else acknowledges that, it is not simple or straightforward so we leave them to deliberate on what they

have heard so far. To the applicants, submitters and the group from EPA, also thanks to you. Those especially who presented and provided their thoughts into the process, thank you very much for that.

I mentioned that we are all going to scatter to our different directions now but wherever we are seeing this hearing from, wherever you are setting listening to this, live well, go well in the spirit of peace. The karakia I cited at the end there pretty much as it applies to this situation that says that we have taken on board and been immersed in a lot of really dense information. We have been drawing on the power of knowledge and evidence and how is the time to depower and tune out that we have been through this process.

(Māori content - to be inserted when transcript is finalised).

MS JONES: Thank you.

MATTER ADJOURNED AT 12.34 PM